Weed Control

The use of in-crop herbicides to control weeds is often very important in determining the success or failure of a crop. However, many other practices that can be implemented before and after a herbicide application can help to reduce weed competition. The use of these practices is termed Integrated Weed Management.

Integrated Weed Management

A farming system that utilises an array of inter-dependent cultural, biological and herbicidal weed control practices is implementing Integrated Weed Management (IWM). It is essential that IWM involves an array of tools including the rotation of available herbicide groups, ensuring that weeds are exposed to a diverse range of control mechanisms. The principal aim of IWM is to reduce selection for resistance to any single control agent and to delay or prevent the development of herbicide resistant weeds.

Practising IWM does not mean abandoning chemical weed control, just relying on it less. For example:

- You may decide to choose a normal-height wheat or a tall, viny pea variety for a certain field. These crop selections will compete strongly with weeds, possibly allowing you to skip a spray operation.
- You could insert a short-term forage crop into your crop rotation. Studies show that short-term alfalfa stands can reduce wild oat and green foxtail populations by up to 80 percent the year after breaking.
- Early sown barley may give you enough of a "jump" on the weeds that you can avoid herbicide applications.
- Use of vigorous, high-quality seed, sown shallow, can give you better crop competition than poor-quality or deeply sown crop seed.
- Banding nitrogen near the seed can give your crop an advantage over weeds.

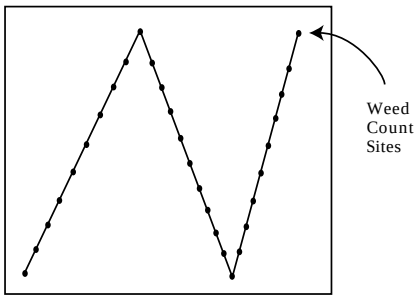
For more information, refer to "Integrated Weed Management: Making it Work on Your Farm" factsheet, available from both Manitoba Agriculture, Food and Rural Initiatives and Saskatchewan Agriculture and Food.

Making Spray Decisions

Field Scouting

Field scouting is an important tool for making informed spray decisions. Accurately assessing the type and number of weeds in the field will help you determine if a spray operation is necessary. The scouting pattern diagram on this page provides a guideline for scouting a field. The entire field should be walked to get a feel for the distribution of the weeds present. A minimum of 20 weed counts should be taken across the field. A smaller number may be used, but be aware that accuracy decreases as the number of counts gets smaller. Count the number of weeds in a 1 m^2 or a 0.25 m^2 area and divide the total number of weeds by the number of counts taken to obtain an average for the field. If using 0.25 m^2 samples, make sure to multiply by four so your average is for a 1 m^2 area.

Some weeds are not distributed uniformly and may be found in patches (for example, Canada thistle) or in low spots. As well, the type and number of weeds found along the field edges may be very different from those found inside the field. These areas should be considered separate from the rest of the field. If possible, patches, low spots, and field borders should be treated separately, as field wide spraying may not be required. Look out for new invading weeds and patches of herbicide-resistant weeds. Herbicide-resistant weeds and new invaders should be controlled, regardless of their number, to prevent them from spreading and becoming a serious control problem. Mapping your field's weed problems will allow you to monitor the spread of weed patches over time and help you assess the effectiveness of your control program.



Yield Losses Caused by Weeds

Knowing the amount of crop yield loss caused by a given weed density will help you decide if a spray operation is required. The tables on the following pages give an indication of the yield loss caused by some of the important grassy weeds.

THESE TABLES SHOULD BE USED ONLY AS A GUIDE. The figures are based on Western Canadian research trials and will not be accurate all of the time. The yield loss values apply only to healthy, well fertilized crops with good stand establishment. Crops that are diseased or emerged unevenly will not compete well with weeds and will suffer larger yield losses than indicated in these tables. The yield loss figures are based on competition from single weed species only. Other weeds, such as wild mustard or Canada thistle, must be controlled if the figures are to be accurate. As well, the tables are based on competition from normal height crops. Semi-dwarf or hybrid varieties may not compete as well with weeds and the figures may not be accurate in these cases.

Table 1. Yield Losses (Percent) in Wheat Caused by Wild Oats.

	Wild Oat Density – Number Per Square Metre																
	1	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**25**	**30**	**35**	**40**	**45**	**50**
Wild Oats are 1 Leaf Stage Ahead of the Crop	1	2	4	6	8	10	12	14	15	17	19	22	26	29	32	34	37
Wild Oats are the Same Leaf Stage as the Crop	1	1	2	4	5	6	7	8	9	10	11	14	16	18	20	22	24
Wild Oats are 1 Leaf Stage Behind the Crop	0	1	1	2	3	3	4	5	5	6	7	8	10	11	13	14	15

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Figure 1. Spray Decision Guideline for Wild Oats in Wheat.

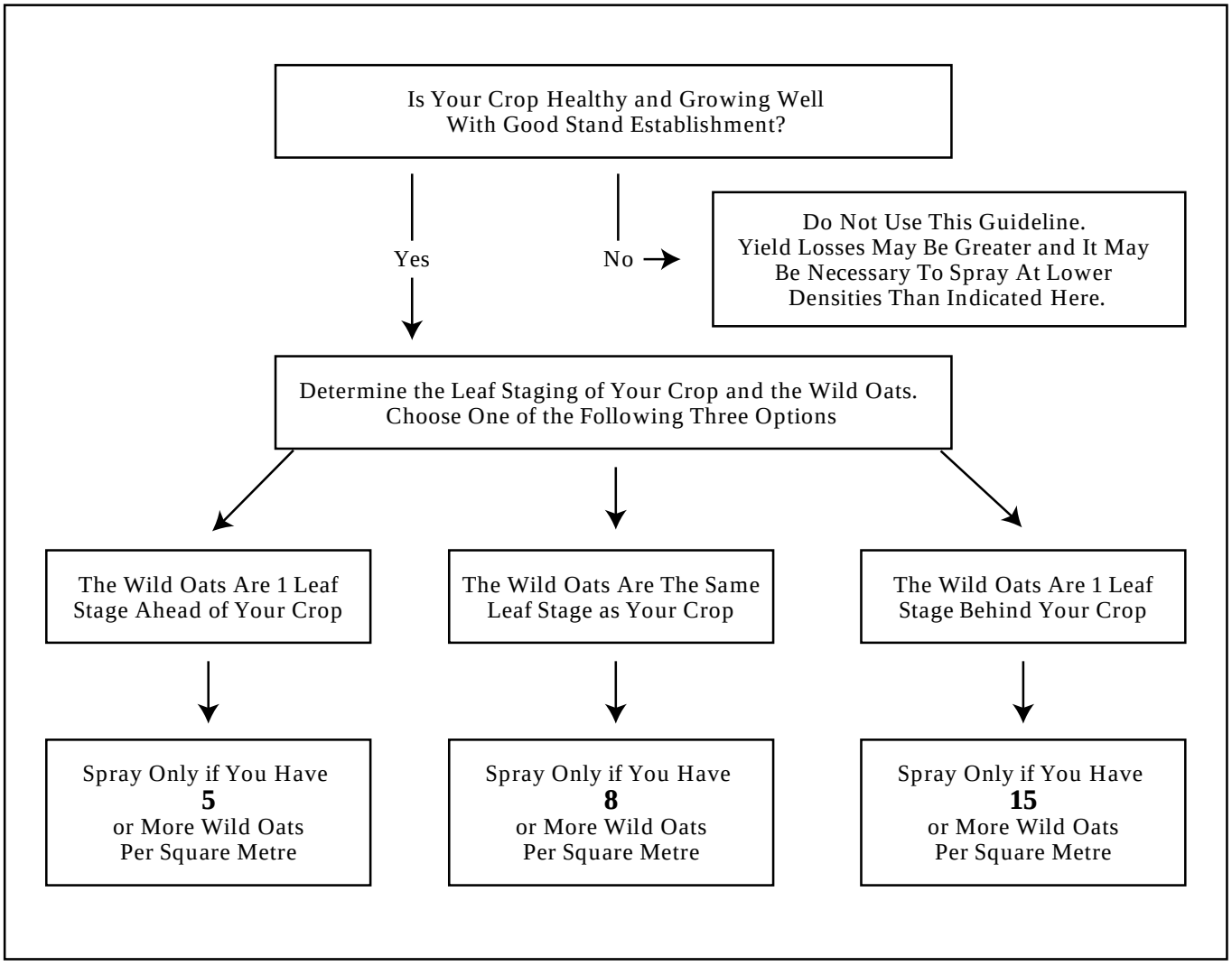
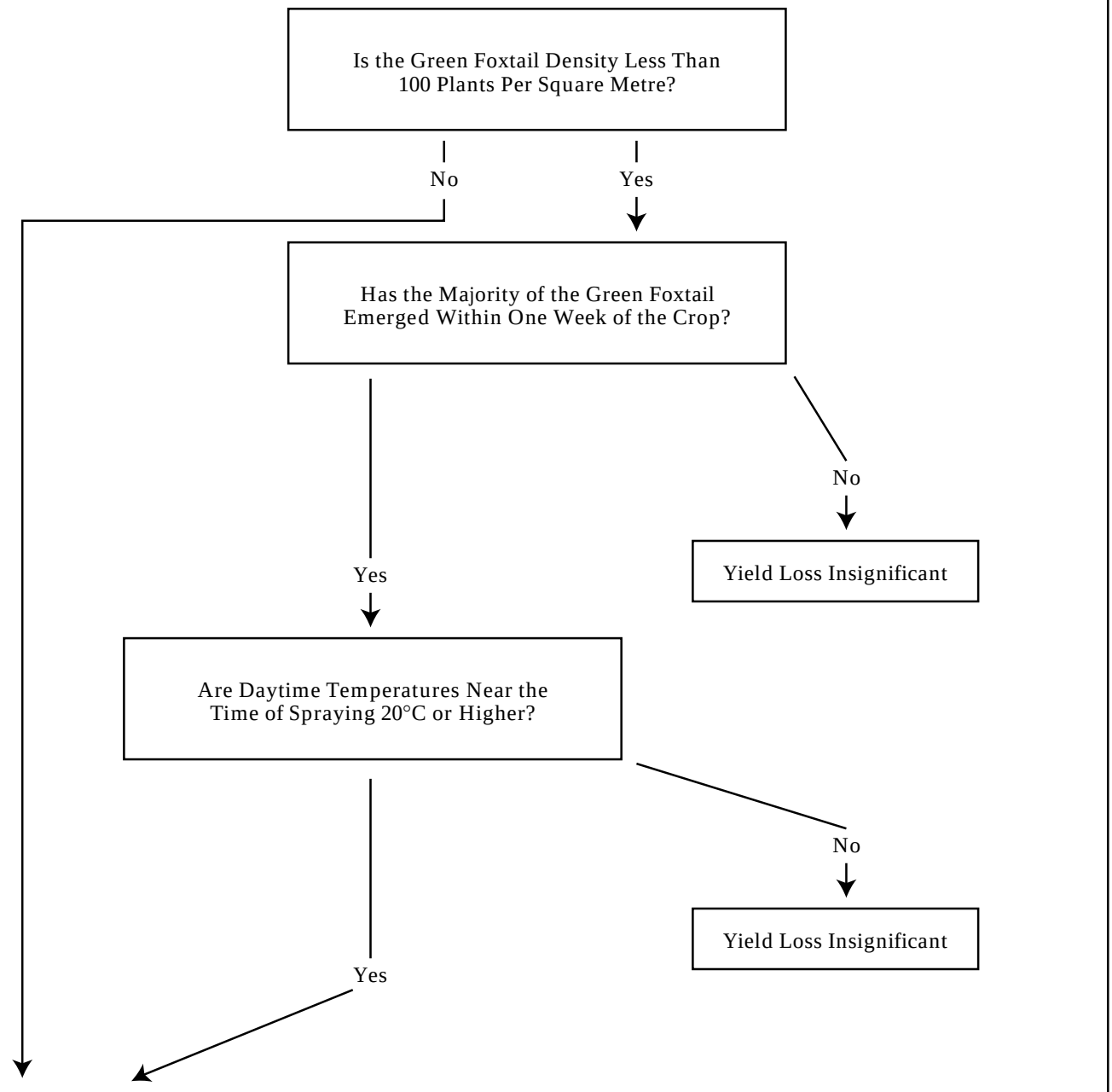


Table 2. Yield Losses (Percent) in Wheat Caused by Green Foxtail (Wild Millet).



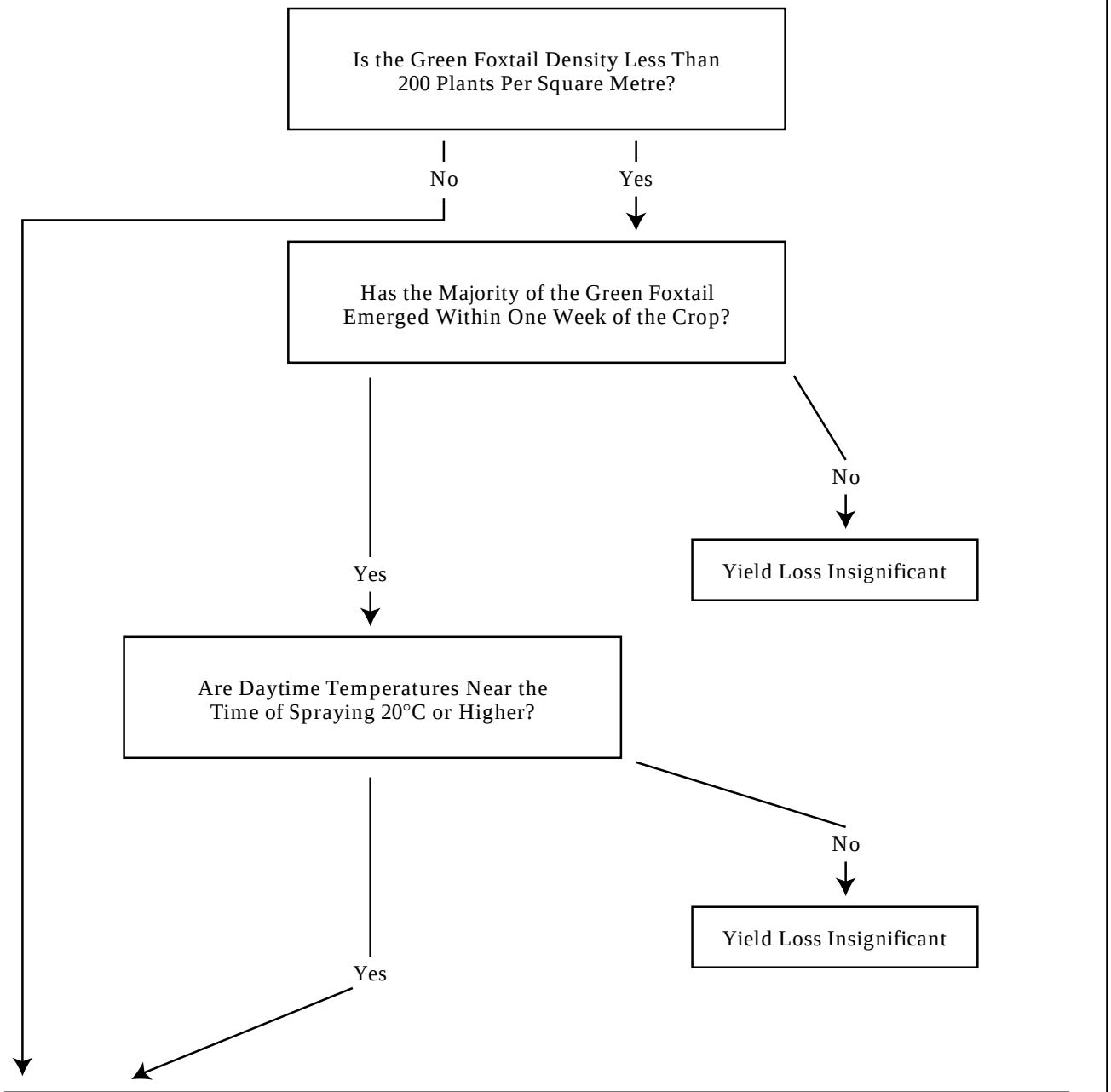
Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	2	3	5	6	7	8	9	11	14	16	18	20	23

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 3. Yield Losses (Percent) in Barley Caused by Wild Oats.

Crop Density (plants/m^2)	Relative Emergence	Wild Oat Density (plants/m^2)											
		1	**5**	**10**	**15**	**20**	**25**	**30**	**40**	**50**	**70**	**100**	**150**
300	Wild Oats are 1 Leaf Stage Ahead of the Crop	0.3	1.4	2.8	4.1	5.4	6.7	8.0	10.3	12.6	16.8	22.4	30.2
	Wild Oats are the Same Leaf Stage as the Crop	0.3	1.3	2.5	3.7	4.8	6.0	7.1	9.2	11.3	15.1	20.3	27.6
	Wild Oats are 1 Leaf Stage Behind the Crop	0.2	0.9	1.7	2.6	3.4	4.2	5.0	6.6	8.1	11.0	15.0	20.9
225	Wild Oats are 1 Leaf Stage Ahead of the Crop	0.4	1.9	3.6	5.4	7.0	8.6	10.2	13.1	15.9	20.9	27.4	36.2
	Wild Oats are the Same Leaf Stage as the Crop	0.3	1.6	3.1	4.6	6.1	7.5	8.8	11.4	13.9	18.4	24.4	32.6
	Wild Oats are 1 Leaf Stage Behind the Crop	0.2	1.0	2.0	3.0	4.0	4.9	5.8	7.6	9.3	12.6	17.1	23.6
175	Wild Oats are 1 Leaf Stage Ahead of the Crop	0.5	2.3	4.6	6.7	8.7	10.7	12.5	16.1	19.3	25.1	32.3	41.8
	Wild Oats are the Same Leaf Stage as the Crop	0.4	1.9	3.8	5.6	7.3	8.9	10.5	13.6	16.4	21.6	28.2	37.1
	Wild Oats are 1 Leaf Stage Behind the Crop	0.2	1.1	2.3	3.4	4.4	5.5	6.5	8.5	10.4	14.0	18.9	25.9

Table 4. Yield Losses (Percent) in Barley Caused by Green Foxtail (Wild Millet).



Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	1	2	3	3	4	5	6	7	8	10	11	13	14

Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 5. Yield Losses (Percent) in Canola Caused by Wild Oats and Volunteer Cereals.

	Weed Density – Number Per Square Metre												
	1	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**25**	**30**
Wild Oats	3	5	6	8	9	10	11	12	13	14	15	16	18
Volunteer Wheat	1	3	6	8	10	11	12	14	15	16	17	19	21
Volunteer Barley	3	5	8	10	12	14	15	17	18	19	20	23	25

Sources: Dew and Keys, Agriculture Canada (Lacombe, Alberta)
O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Figure 2. Spray Decision Guideline for Wild Oats and Volunteer Cereals in Canola.

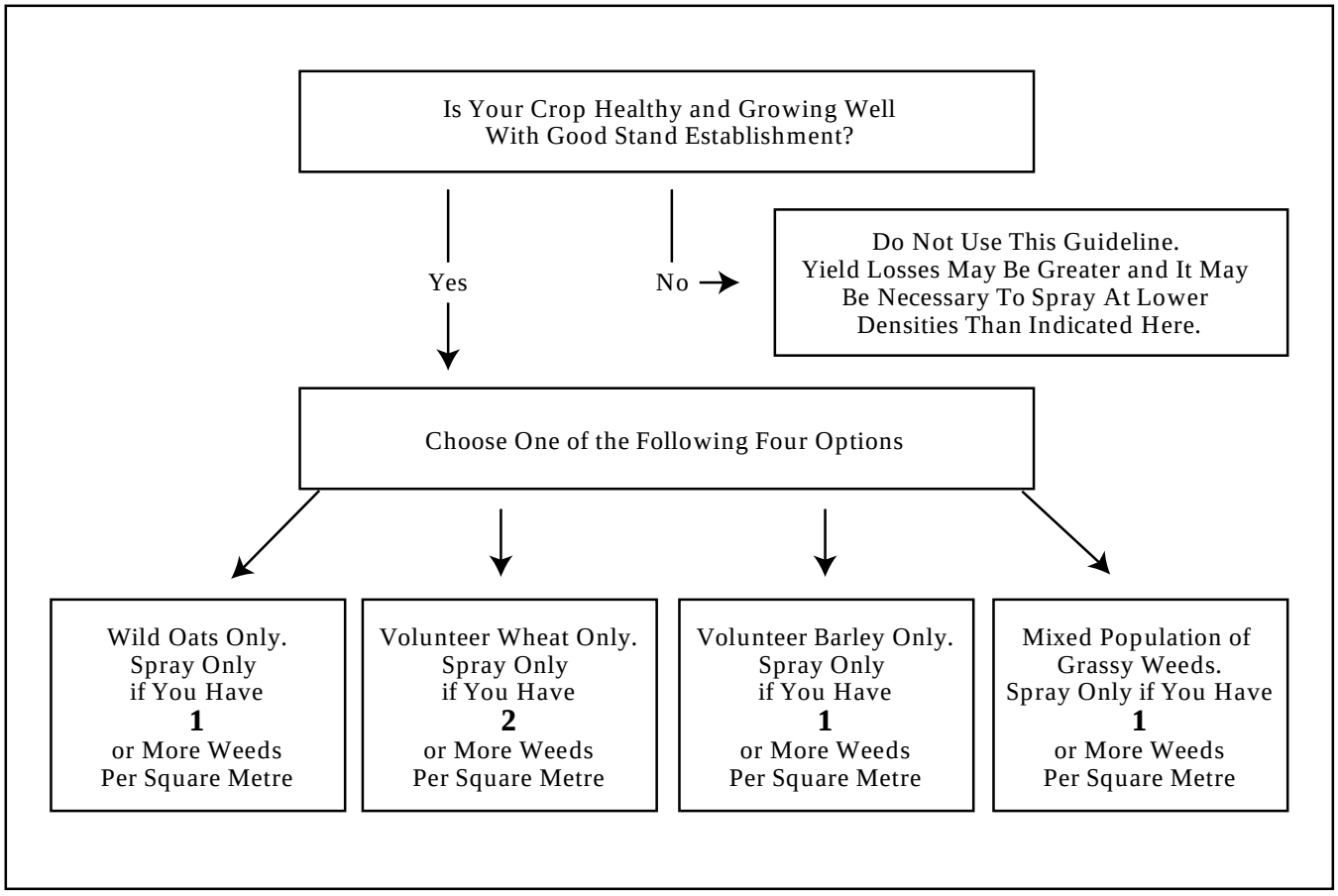
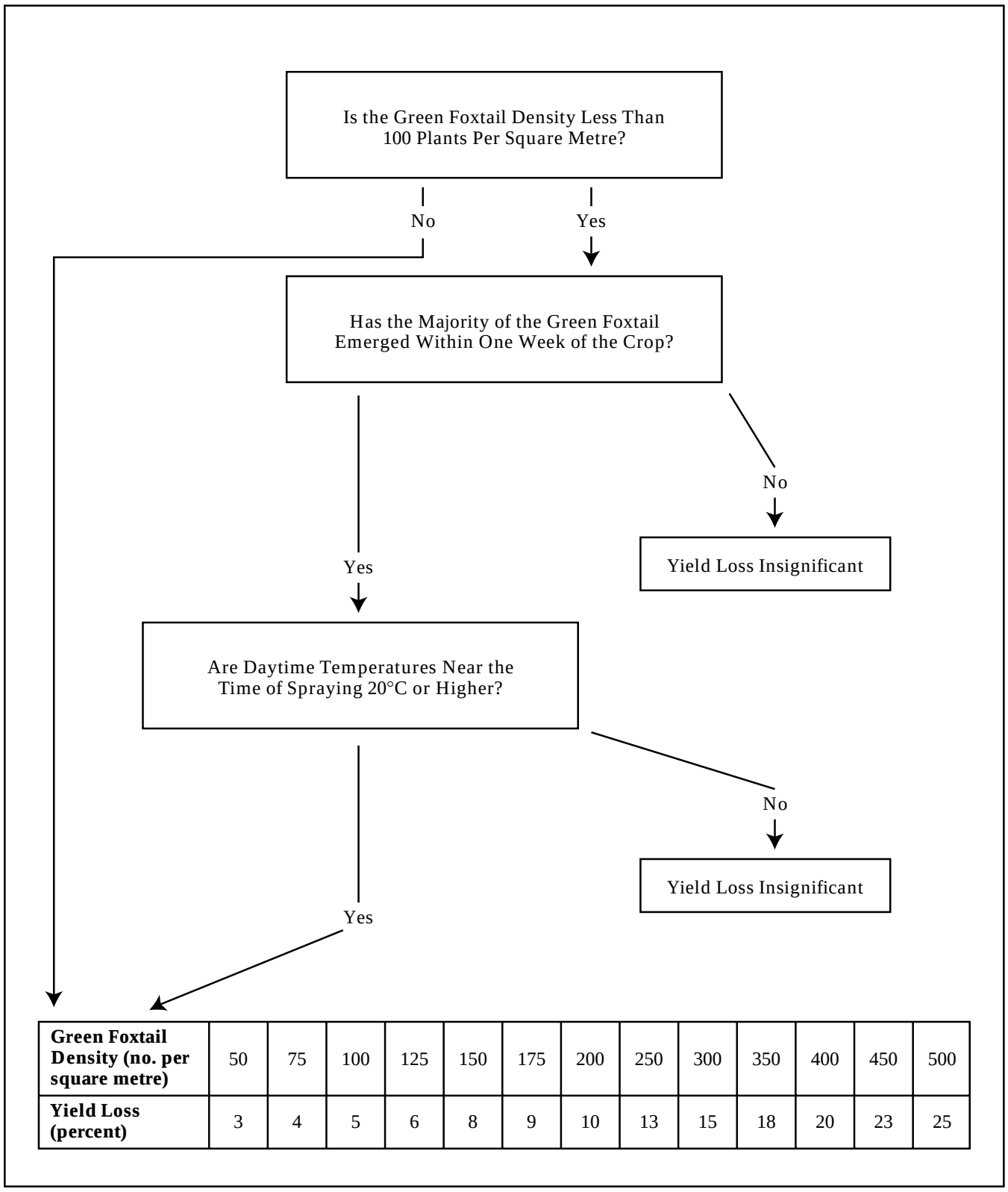


Table 6. Yield Losses (Percent) in Canola Caused by Green Foxtail (Wild Millet)



Green Foxtail Density (no. per square metre)	50	75	100	125	150	175	200	250	300	350	400	450	500
Yield Loss (percent)	3	4	5	6	8	9	10	13	15	18	20	23	25

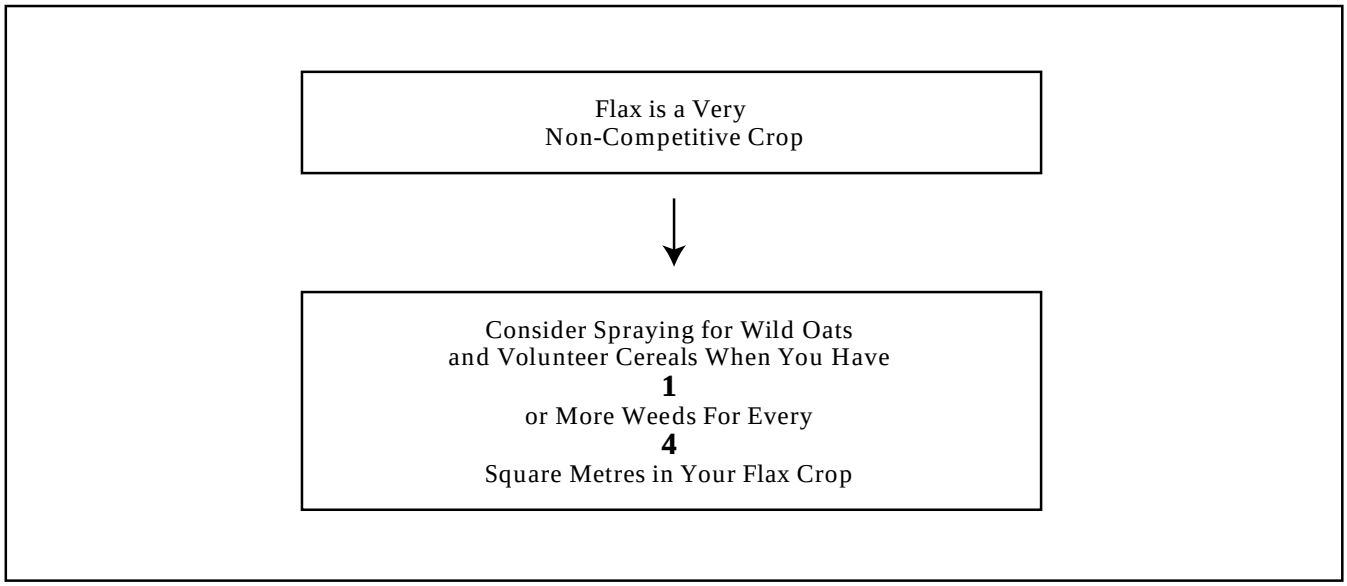
Source: O'Donovan, Alberta Environmental Centre (Vegreville, Alberta)

Table 7. Yield Losses (Percent) in Flax Caused by Wild Oats and Volunteer Cereals.

	Weed Density – Number Per Square Metre									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Wild Oat	6	8	10	12	13	15	16	17	18	19
Volunteer Wheat	6	11	15	18	22	24	27	29	31	33
Volunteer Barley	6	12	16	21	24	28	31	34	36	39

Sources: Dew and Keys, Agriculture Canada (Lacombe, Alberta)
Friesen et al., University of Manitoba (Winnipeg, Manitoba)

Figure 3. Spray Decision Guideline for Wild Oats and Volunteer Cereals in Flax.



Deciding to Spray – Economic Thresholds and Herbicide Resistance

An **economic threshold** is the level of infestation at which lost yield exceeds the cost of the chemical and its application. Determining the economic threshold will help you decide if a spray operation is necessary.

The following example outlines how to determine an economic threshold:

You have a wild oat problem in your wheat. After a thorough field scouting you have determined that your field has an average density of 35 wild oats per square metre. You know that the crop and weeds are at the same leaf stage. Using Table 1, choose the "Same Leaf Stage" row and read across to **35** wild oats per square metre. You will find that your yield loss will be about **18** percent.

You think it could be a 40 bushel per acre wheat crop, and expect to get $3 per bushel for it. Therefore:

40 bushels x 0.18 (percent of expected yield loss) =
7.2 bushels per acre of lost yield

7.2 bushels x $3 per bushel =
$21.60 per acre of lost income

Now find out the price of your herbicide. Most wild oat herbicides for wheat cost about $15 per acre. In this case, lost income exceeds the cost of the herbicide and application, so spraying would be justified.

Alternatively, you may want to use the figures provided with some of the yield loss tables. These figures provide flowcharts to assist you in making spray decisions. In some cases the flowcharts may indicate to spray when you do not have an economic threshold weed density, but most times they will prevent you from spraying unnecessarily.

Another factor to consider when deciding whether to spray is your herbicide rotation. A one in three rotation of herbicide groups is currently recommended to delay the development of herbicide resistance for weeds such as wild oats and green foxtail. Skipping a spray operation will give you an extra year of flexibility in your herbicide rotation. This means that you have one extra herbicide group to choose from the year after you skipped the spray operation. When making spray decisions, the ability to rotate herbicides should be considered in addition to the economics of spraying.

Making the Spray Decision

Remember that economic thresholds should be used only as guides when making a spray decision. Lost income caused by dockage or downgrading must also be considered. **FIELDS THAT ARE NOT SPRAYED THIS YEAR HAVE A HIGHER POTENTIAL FOR PROBLEMS THE FOLLOWING YEAR BECAUSE OF WEED SEED RETURN.** A farmer's experience and common sense play an important role when deciding to spray. Used properly, however, the economic threshold can be an important tool in making spray decisions.

Weed Resistance to Herbicides

In recent years, the number of herbicide-resistant weeds and the areas they infest have increased.

Most herbicide-resistant weed infestations have developed following repeated use of the same herbicide (or herbicide group) for a number of years on the same field. Growers who have developed weed resistance on their farms will typically see a weed, which is normally controlled by a herbicide, escape uncontrolled after a number of years of use of the same product or product group. Individual plants may be resistant to 1.5 up to 10 or more times the normal field rate.

Herbicide Groups

To help you plan your herbicide program, the following table lists "herbicide groups." To slow down the process of developing weed resistance, use products from different groups from year to year on your fields.

Table 1: Herbicide Groups Based on Mode of Action

Group 1 (contain ACCase grasskillers) Achieve, Achieve Liquid Gold*, Assure II, Axial, clethodim, FlaxMax Ultra*, FlaxMax DLX*, Fusion, Harmony Total*, Harmony SG*, Harmony K*, Horizon, Horizon BTM*, Muster Gold II*, Odyssey DLX*, Poast Ultra, Prevail*, Puma^{120} Super, Pursuit Ultra*, Venture
Group 2 (contain ALS/AHAS inhibitors) Absolute*, Accent, Adrenalin*, Ally, Altitude FX*, Assert, Escort, Everest, Express Pack*, Express TNG, Express SG, Frontline*, Frontline 2,4-D*, Harmony Total*, Harmony SG*, Harmony K*, K2, Muster TNG, Muster Gold II*, Odyssey, Odyssey DLX*, Option, Pinnacle, PrePass*, Prism, Pursuit, Pursuit Ultra*, Refine Extra TNG, Refine SG, Refine M*, Solo, Spectrum*, Sundance, Triton C*, Ultim, Unity*
Group 3 (contain mitotic inhibitors) Advance, Bonanza, Edge, Fortress*, Rival, Treflan
Group 4 (contain growth regulator herbicides) 2,4-D, 2,4-DB, Absolute*, Achieve Liquid Gold*, Adrenalin*, Altitude FX*, Attain, bromoxynil + 2,4-D ester*, bromoxynil+MCPA ester*, Curtail M, dicamba, dicamba+mecoprop+MCPA, dichlorporp+2,4-D, DyVel, DyVel DSp, Eclipse*, Express Pack*, FlaxMax Ultra*, FlaxMax DLX*, Frontline*, Frontline 2,4-D*, Grazon, Harmony K*, Horizon BMT*, Lontrel, MCPA, MCPB+MCPA, mecoprop, Prestige, Prevail*, Refine M*, Remedy, Restore, Rustler*, Shotgun*, Spectrum*, Tordon 22K, Triton C*, Trophy
Group 5 (contain photosynthetic inhibitors – triazines) Atrazine, Laddock*, Primextra II Magnum*, Sencor, Shotgun*, simazine, Velpar

Group 6 (contain photosynthetic inhibitors – nitriles/benzothiadiazoles) Achieve Liquid Gold*, Basagran, bromoxynil, bromoxynil + 2,4-D ester*, bromoxynil+MCPA ester*, Horizon BTM*, Laddock*, Unity*
Group 7 (contain photosynthetic inhibitors – ureas/amides) linuron
Group 8 (unknown mode of action) Avadex BW, Avenge, Eptam 8E, Eradicane 8E, Fortress*
Group 9 (contain inhibitors of EPSP synthase) Credit, Eclipse*, Factor, Factor 540, Glyfos, Maverick II, PrePass*, Renegade HC, Roundup (Transorb HC, Ultra, WeatherMax), Rustler*, Touchdown iQ, Vantage Plus Max
Group 10 (contain inhibitors of glutamine synthetase) Liberty
Group 11 (inhibit carotenoid synthesis - triazoles) Amitrol 240
Group 14 Reflex
Group 15 (inhibit cell division - benzamides, chloroacetamides) Dual II Magnum, Frontier, Kerb, Primextra II Magnum*
Group 22 (membrane rupture, photosynthetic inhibitors) Gramoxone, Reglone, Reward

*Products contain more than one active ingredient and appear in more than one group. In some instances, both active ingredients act to kill the same weed using different modes of action. In these instances, use of tank mixes may slow down the process of developing weed resistance.

New herbicides do not necessarily have a unique mode of action and may fall within the groups listed in the charts.

Herbicides that have the same mode of action may not control the same weed spectrum or have the same crop safety. For example, Assert and Ally have the same mode of action; however, Assert controls wild oats while Ally does not.

How Herbicides Work

After applying a herbicide, fields can be scouted to determine the effectiveness of the treatment. The symptoms of different herbicide groups, and the approximate time it takes to develop these symptoms, is listed in the table below. Weed patches that are not affected should be noted and checked, as they may be herbicide resistant. Note that symptoms may take longer to develop when conditions are not conducive to rapid plant growth.

Table 2: The Mode of Action, Site of Uptake and Symptoms of Different Herbicide Groups.

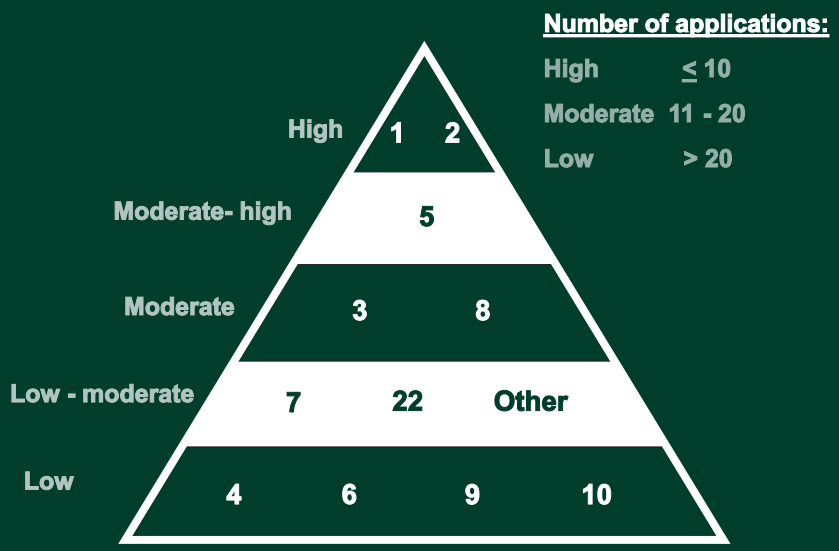
Herbicide Group	Mode of Action	Site of Uptake	Weed symptoms/timing	
			Grass weeds	**Broadleaf weeds**
1	Systemic	Foliar	Reduced growth, yellowing of growing point in 1-3 weeks. Newest leaf of affected plant pulls out easily in 3 to 5 days.	Tolerant
2	Systemic	Foliar / Soil	Newest leaves yellowed in 3-10 days, dead in 1-3 weeks.	Discolored (red / yellow / purple) at the growing point and spreading to the whole plant in 1-3 weeks.
3	Systemic	Soil	Reduced emergence, poor root development of emerged plants. Roots often swollen / stunted and root tips darkened.	Reduced emergence, poor root development of emerged plants.
4	Systemic	Foliar	Yellowed / purpled leaves in 1-2 weeks, plant death in 2-4 weeks.	Abnormal growth (twisted stems, cupped leaves) in 2-10 days.
5	Systemic	Soil	Wilted and yellowed oldest leaves, death in 7-10 days.	Wilted and yellowed oldest leaves, death in 7-10 days.
	Contact	Foliar	Yellowed oldest leaves, death within days."	Bleached oldest leaves, death within days.
6	Contact	Foliar	Some leaf burn possible.	Yellowed leaves in 2-4 days, death in 1-2 weeks.
7	Systemic	Soil	Yellowed and stunted plants, death in 10-14 days.	Yellowed and stunted plants, death in 10-14 days.
	Contact	Foliar	Interveinal yellowing of oldest leaves, death within days.	Interveinal yellowing of oldest leaves, death within days.
8	Contact	Foliar	Yellowed leaves in 3-7 days, stunted plants.	Tolerant
	Systemic	Soil	Reduced emergence, emerged leaves dark green / blue.	Reduced emergence, emerged leaves dark green / blue.
9	Systemic	Foliar	Wilted, yellowed leaves in 7-10 days.	Wilting, yellowing of plant in 7-10 days.
10	Contact	Foliar	Wilted, bleached leaves in 3-5 days, death in 1-2 weeks.	Wilted, bleached leaves in 3-5 days, death in 1-2 weeks.
11	Systemic	Foliar	Plants wilted in 2-3 days, bleached and purpling leaves in 1-2 weeks.	Plants wilted in 2-3 days, bleached leaves in 1-2 weeks. Perennial plants die slowly.
14	Contact	Foliar	Some leaf burn.	Leaves yellowed and dessicated in 1-3 days.
15	Sytemic	Soil	Reduced emergence, emerged plants stunted.	Reduced emergence, emerged plants stunted.
22	Contact	Foliar	Leaves wilted within hours, dessicated in 1-3 days.	Leaves wilted in 1-3 days, dessicated and dead in 3-7 days.

HERBICIDE ROTATION - 2007

Resistance to a pesticide group will reduce the effectiveness of pesticides in that group over time. Rotation of herbicides and other pesticides is an important measure to delay the onset of resistance to any one pesticide group or mode-of-action.

By rotating herbicides, the risk of developing widespread resistance over a field drops. The illustration below gives a relative ranking of risk of resistance developing from repeated use. The top of the triangle indicates groups that may develop resistance quickly and those at the bottom of the triangle have demonstrated a low risk of resistance developing over long-term use. Be aware that low risk does not mean no risk since weeds have developed resistance to herbicides in these groups as well.

Herbicide Resistance Development Risk based on Number of Applications



Classification of herbicide group numbers by risk of selection for weed resistance ('Other': all other herbicide groups that pose a low or moderate risk)
Adapted from **Beckie, H. J., 2006** ***Herbicide Resistant Weeds: Management Tactics & Practices***
Weed Technology Vol. 20 Issue 3 (July-September) pp. 793-814

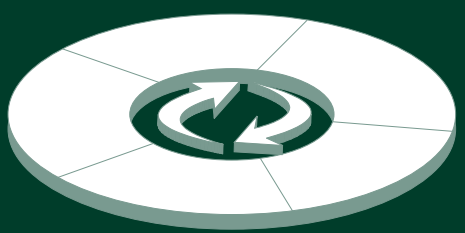
Rotation of Herbicides

OTHER GROUPS
Liberty (10, Amitrole (11), Reflex (14), Dual II Magnum (15), Frontier (15), Kerb (15), Primextra Magnum* (15), Casaron (20), Gramoxone (22), Reglone (22)

GROUP 1 (Grass Control)
Achieve, Assure II, Aramo (BASF – DLX* products), Axial, Clethodim, Fusion, Horizon, Poast Ultra, Puma[120] Super, Venture

GROUP 2 (Grass & Broadleaf control)
Accent, Adrenalin*, Ally, Altitude FX*, Assert, Everest, Express, Express Pack*, Frontline*, Muster, Odyssey, Odyssey DLX*, Option, Pinnacle, Prism, PrePass*, Pursuit, Refine Extra or SG, Solo, Spectrum*, Sundance, Triton C*, Ultim, Unity*

GROUP 9
(Grass & Broadleaf control)
Eclipse*, Glyphosate, PrePass*, Rustler*



GROUP 3 (Grass & Broadleaf control)
Edge, Fortress*, Trifluralin

GROUP 8 (Grass & Broadleaf control)
Avadex, Avenge, Eptam, Eradicane, Fortress*

GROUP 4 (Broadleaf Control)
2,4-D, 2,4-DB, Adrenalin*, Altitude FX*, Attain, bromoxynil + 2.4-D ester*, bromoxynil+MCPA ester*, Curtail M, dicamba, dicamba+mecoprop+MCPA, dichlorprop+2,4-D, Dyvel, Dyvel DSp, Eclipse*, Express Pack*, FlaxMax*, FlaxMax DLX*, Frontline*, Lontrel, MCPA, MCPB+MCPA, mecoprop, Prestige, Rustler*, Shotgun*, Spectrum*, Triton C*, Trophy, and mixes containing these active ingredients

GROUP 7 (Grass & Broadleaf control)
Linuron

GROUP 6
(Broadleaf Control)
Basagran, bromoxynil, bromoxynil +2.4-D ester*, bromoxynil+MCPA ester*, Laddok*, Unity*

GROUP 5
(Grass & Broadleaf control)
Atrazine, Laddok*, Primextra Magnum*, Sencor, Shotgun*, Simazine, Velpar

* Some products contain more than one active ingredient and therefore may appear in more than one group.

SASKATCHEWAN AGRICULTURE AND FOOD
3085 Albert Street Regina, Saskatchewan CANADA S4S 0B1

www.agr.gov.sk.ca

Printed January 2007
40M ISBN 088656-59953 0164

GUIDE TO CROP PROTECTION 2007

How to Identify Weed Resistance

It is important to avoid confusing herbicide failure caused by resistance with herbicide failure caused by various other factors (such as weather or application errors). When a herbicide fails to control weeds because of weather or application factors, that herbicide may work in the field the next season. But when herbicides fail because of the development of resistance, they will fail in subsequent years, regardless of weather or application procedures.

Herbicide resistance should be suspected under the following conditions:

- A weed species that the herbicide controlled in previous seasons now escapes the treatment, while other weeds that appear on the label continue to be controlled in the field.
- The escapes cannot be attributed to adverse weather or emergence after application (if a post-emergence product is in question).
- Irregular-shaped patches of a weed develop where the herbicide gives little or no control.
- Records of the past history of the field show repeated use of the same herbicide, or combinations of herbicides, that kill the weed in question in the same way.

Table 3: Herbicide-Resistant Weeds in Western Canada

WEED	HERBICIDE GROUP	LOCATIONS CONFIRMED
Canada Fleabane	Group 9	Occurs in several US states
Cleavers	Group 2	AB
	Group 4	AB
	Multiple combinations of:Groups 2 & 4	AB
Chickweed	Group 2	AB
Green Foxtail	Group 1	AB, MB, SK
	Group 2	Occurs in MB & Ontario
	Group 3	AB, MB, SK
	Multiple combinations of: Groups 1 & 3	MB, SK
Hemp-nettle	Group 2	MB
	Group 4	AB
Kochia	Group 2	AB, MB, SK
	Group 4	Occurs in North Dakota and Montana
Lamb's-quarters	Group 2	Occurs in Ontario
	Group 5	Occurs in Ontario
Marshelder (Giant ragweed)	Group 2	Occurs in North Dakota
Mustard, Ball	Group 2	AB
Mustard, Wild	Group 2	AB, MB, SK
	Group 4	MB
	Group 5	MB
Persian Darnel	Group 1	SK
Redroot pigweed	Group 2	Occurs in MB, Ontario and North Dakota
	Group 5	Occurs in Ontario
Russian thistle	Group 2	Occurs in SK, North Dakota and Montana
Spiny Annual Sow-thistle	Group 2	AB
Stinkweed	Group 2	AB
Wild oat	Group 1	AB, MB, SK,
	Group 2	AB, MB, SK
	Group 8	AB, MB, SK
	Multiple combinations of: Groups 1 & 2, 1 & 8, 2 & 8, 1, 2 & 8	AB, MB, SK

See Table 1 on page 27 for a complete list of products in each Herbicide Resistance Group.

If Weed Resistance Develops on Your Farm

It is important to identify weed resistance before it spreads across your farm. Plan on conducting a "patch watch" scouting program this summer to identify suspicious patches before they become difficult to manage. Resistant weed patches have been identified on fields where producers were unaware of their existence.

Your patch watch program should begin shortly after spraying and continue through July after the crop has headed out and most weeds are visible from a distance. If you find suspicious looking patches, contact your local agricultural office or crop protection company representative to assist you in confirming weed resistance. If resistance is suspected:

1. Map the location of the patches and mark them with stakes so you will remember their location.
2. Mow, cultivate or spot spray the patches. Resistant patches should not be allowed to produce seed.
3. Patchy areas should NOT be harvested with the rest of the field. Harvest these areas separately, and make sure to clean all harvesting equipment before leaving the area to prevent the spread of seeds across the field or to a neighbouring field.
4. Check patches each year to monitor their spread. Keeping your resistant weeds isolated to a manageable patch is easier than dealing with an entire field of resistant weeds.

Surfactants and Herbicide Registrations:

Registrations listed are strictly those listed on the adjuvant label. For adjuvants recommended for use with a specific product, see the product page.

SURFACTANT	% Active ingredient	TYPE	REGISTERED HERBICDES
Agral 90 (PCP#11809 or 24725), Agsurf (PCP#15881 or 27921)	90	Non-ionic	Accent, Adrenalin SC, Ally, Altitude FX, Escort, Everest, Glyphosate, Gramoxone, Muster, Pinnacle, Pursuit, Prism, Refine Extra, Refine SG, Refine M, Reflex, Reglone, Reward, Ultim, Unity
Citowett Plus (PCP#12766)	50	Non-ionic	Accent, Ally, atrazine, Basagran (peas), Escort, Muster, Pinnacle, Prism, Refine Extra, Refine M, Refine SG, Ultim, Unity
Companion (PCP#15882)	70	Non-ionic	Ally, Glyphosate, Muster, Refine Extra, Unity
Permax (PCP#22604)	76	Non-ionic	Ally, Glyphosate, Muster, Refine Extra, Reglone
Super Spreader (PCP#17402)	50	Non-ionic	Accent, Ally, atrazine, Basagran, Escort, Everest, Muster, Pinnacle, Prism, Refine Extra, Reflex, Ultim, Unity
LI700 (PCP#23026)	80	Non-ionic	Everest, Glyphosate

* Note – some products are specific about the concentration of active ingredient in the surfactant for product performance. Check with the herbicide page in this guide or the product label.

Oil-based Adjuvants and Herbicide Registrations:

TRADE NAME	COMPOSITION	REGISTERED HERBICIDES
Adapt (XA oil Concentrate) (PCP#11769)	83% paraffin based mineral oil 17% surfactant blend	Atrazine, Basagran
Adigor Adjuvant	48.8% methylated rapeseed oil 28.2% ethoxylated alcohols	Axial*
Amigo (PCP#22644)	30% phosphate ester surfactant	Centurion*, Select*
Assist (PCP#16937)	83% paraffin based mineral oil 17% surfactant blend	Basagran (all crops), Laddok
Corn oil (PCP#18473)	99% paraffin based mineral oil 1% surfactant blend	Atrazine, linuron
Hasten (PCP#27420)	77.4% methyl and ethyl oleate (esterified vegetable oil)	Option 35DF
Merge (PCP#24702)	50% solvent 50% surfactant blend	Absolute, Assure II, FlaxMax DLX*, FlaxMax Ultra, Muster Gold II*, Odyssey, Odyssey DLX, Poast Ultra, Pusuit Ultra, Solo, Sundance*, Triton C

Continued on next page

TRADE NAME	COMPOSITION	REGISTERED HERBICIDES
Score (PCP#12200)	83% paraffin based mineral oil 17% surfactant blend	Harmony K*, Harmony SG*, Harmony Total*, Horizon*, Horizon BMT*
Sure-Mix (PCP#25467)	60% paraffin based mineral oil 35.6% surfactant blend	Assure II*, Muster Gold II*, Refine Extra
Turbocharge (PCP#23135)	50% mineral oil 39.5% surfactant blend	Achieve Liquid*, Achieve Liquid Gold*, Prevail Liquid*

Adjuvants and Your Herbicide

Adjuvants are important ingredients in chemical weed control. Many herbicides must be applied with an adjuvant. If it is forgotten, the level of weed control can vary widely, and re-spraying may be necessary.

Most products have adjuvants built into the formulation (e.g. Puma). Other require adjuvant addition (e.g. Refine Extra). Some adjuvants were developed specifically for one herbicide, and these are either pre-packaged with the herbicide, or are identified by name on the label (e.g. Turbocharge for Achieve, Amigo for Select).

With some products, adjuvants need to be added only under certain conditions. For example, glyphosate products have built-in adjuvants, but require additional adjuvant when low rates (pre-seeding or chem-fallow), high water volumes, or certain tank mixes are used.

Adjuvants should be added only when required. If one is not required, addition can reduce weed control or injure crops. Product labels will describe when an adjuvant is required, and what type should be used.

There are two main classes of adjuvants: "activators or spray modifiers" (these include surfactants and crop oils), and "utility modifiers" (these include pH adjusters, water conditioners, low-drift adjuvants, and anti-foaming agents). The most important class of adjuvants is the activators. Surfactants, the main group within the activators, are "*surface active agents*." These chemicals produce effects at points where two substances touch, such as between two liquids (herbicide and water) or between a solid and a liquid (herbicide and leaf surface). Some surfactants act as dispersing agents, helping to keep a pesticide suspended in water. Others work on the plant, improving the wetting, sticking and penetrating characteristics of the herbicide droplets. Oil-based adjuvants contain petroleum or vegetable oil plus an emulsifier that suspends the oil in tiny droplets within the spray solution. Oil-based adjuvants typically assist in herbicide penetration into the leaf.

There are two basic type of surfactants (ionic and non-ionic), of which the non-ionic are most common. The tables on the previous page list the surfactants registered for use with herbicides in Western Canada.

Crop and Herbicide Recommendation Tables

The ratings in the following charts give general comparisons based on rates, timing and other application instructions and precautions as outlined in this Guide.

The ratings for crop tolerance and weed control are explained below. Where ratings are not given, a dot (•) will indicate if the weed is listed on a product label. Where rate ranges are listed for controlling a given weed, ratings are based on results achieved with the higher rate.

RATING	CROP TOLERANCE	WEED CONTROL
E - Excellent	Consistently exhibits a high degree of tolerance over a wide range of growing conditions.	Consistently provides a high degree of control over a wide range of growing conditions.
G - Good	Exhibits good crop tolerance under most growing conditions.	Provides good control under most growing conditions.
F - Fair	Tolerance is acceptable depending on growing conditions.	Control is acceptable depending on growing conditions.
P - Poor		Provides suppression, but control is often unacceptable.

All ratings are primarily based on the use of the herbicides on their own. Tank mixing herbicides may reduce the control of one or both tank mix partners, or result in a reduced level of crop safety.

Weed Control Tables

Table 1. Weed Control in Barley

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Corn	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's Purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-D	48	G								P		G	P	E		G	E		E	•	G	E	F	E	P	P		E	P
Achieve Liquid	55	G	F	G			G																						
Achieve Liquid Gold	57	G	F	G			G	E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Ally Toss-N-Go + 2,4-D	60	G						F		G				E	G	G	E		E	E	G	E	G	E	F	F		G	
Assert	65	E					G	P											G					G					
Attain	70	G						G		F	E	G	G[6]	E	F	E	E	E	E	E	G	E	G	E	P	P	E	E	•
Avadex MicroActiv / Extra Strength AvadexBW	72	E					G																						
Avenge	75	G					G																						
Axial	76			•			•																						
Bromoxynil	81	E						G				F				F	G		F	F	G		G	F					
Bromoxynil + 2,4-D	83	E						E	F			G		E		G	E		E	G	G	G	G	G				G	G
Bromoxynil + MCPA	84	E						E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Curtail M	90	G						G					G[6]	E		P	E		E	F		E	F	E	G	G		F	G
Dicamba + MCPA / 2,4-D	92	F						G			G	G	P	E	F[3]	G	E		E	G	G	E	G	E	F	F		G	F
Dicamba + mecoprop + MCPA	94	F						G	G		G			E	F	G	E		E	G	G	E	G	E	F	F		G	G
Dichlorprop + 2,4-D	96	G						G	G			G		E		G	E	F	E	G	G	E	G	E	F	F		G	G
DyVel	99	F						G			F	G		E	F	G	E		E	G	G	E	G	E	F	F		F	F
DyVel DSp	101	F						G			F	G		E		G	E	F	E	G	G	E	G	E	F	F		G	F
Express Pack	113	G						F						E		G	E		E	G	G	E		E		F			G
Fortress	118	G		G			G	P								P	P			P	P								
Frontline	123	E						E		E	E		F[11]		G	•	E		E	E		E	E	E	F	F		E	
Glyphosate (preharvest)	131				G							G[8]													F	G			
Linuron + MCPA amine	150	F		P				G		G		G		E	F	G	E		E	G		E	F	E					
Lontrel	153	E						G																	G	G			
MCPA	155	E										G	P	E	F	F	E		E	F	F	E	P	E	P	P			P
MCPA K	155	E										G		E	F		E		E			E		E	P	P			
Mecoprop	159	G								E	G						E		E							P			
Prestige	173	E						E		G	E		G[6]	E	G	E	E	E	E	G		E	G	E	E	E	E	E	E
Prevail Liquid	174	G		G			G	G					G[6]	E		P	E		E	F		E	F	E	G	G		F	G
Puma[120] Super	178	G	E	E			G																						
Refine Extra Toss-N-Go / Refine SG	183	E						G		E	F			E	E	G	E	F	E	E	E	G	E	E	F	F		G[5]	G
Refine M	185	E						G		E	F			E	E	G	E	F	E	E	E	G	E	E	F	F		G	G
Sencor	194	F							G	G					F		G		G	F	G		G	G				G	
Spectrum	201	E						E		E	E		F[11]	E[6]	E		E		E	E		E	E	E	G	G		E	
Trifluralin (foxtail control)	209	E		G																									
Trifluralin (grassy and broadleaf)	211	F	G	G			F	F		G							G			G									
Triton C[4]	214	E						G		E	•			E	E	G	E	F	E	E	E	G	E	E	F	F		G[5]	G
Trophy	216	E						F			G	G		E	F	E	E		E	E		G	F	G			•	E	•
Unity[1]	219	E						G		G	G			G	E	G	G		E	G		G	G	E				G	

[1] Not for use in Manitoba. [2] 2,4-D mixes only. [3] MCPA K mixes only. [4] Feed barley only. [5] Will not control CLEARFIELD canola varieties. [6] Spring seedlings only.
[8] Not registered for control with all glyphosate products. See glyphosate sections for details. [11] Seedlings and overwintered rosettes. • Ratings not yet developed.

Table 2. Weed Control in Oats

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
Bromoxynil	81	E					G				F				F	G		F	F	G		G	F					
Bromoxynil + MCPA	84	E					E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Curtail M	90	G					G					G[4]	E		P	E		E	F		E	F	E	G	G		F	G
Dicamba + MCPA	92	F					G			G	G	P	E	F[2]	G	E		E	G	G	E	G	E	F	F		G	F
Dicamba + mecoprop + MCPA	94	F					G	G		G			E	F	G	E		E	G	G	E	G	E	F	F		G	G
DyVel	99	F					G			F	G		E	F	G	E		E	G	G	E	G	E	F	F		F	F
Frontline	123	E					E		E	E		F[8]		G	•	E		E	E		E	E	E	F	F		E	
Glyphosate (pre-harvest)[5]	131				G							G[6]												F	G			
Linuron + MCPA amine	150	F		P			G		G		G		E	F	G	E		E	G		E	F	E					
Lontrel	153	G					F																	F	G			
MCPA	155	E									G	P	E			E		E			E		E	P	P			P
MCPA K	155	E									G		E	F		E		E			E		E	P	P			
Mecoprop	159	G							E	G						E		E							P			
Refine Extra Toss-N-Go / Refine SG	183	G					G		E	F			E	E	G	E	F	E	E	E	G	E	E	F	F		G[3]	G
Refine M	185	E					G		E	F			E	E	G	E	F	E	E	E	G	E	E	F	F		G	G
Spectrum	201	E					E		E	E		F[8]	E[4]	E		E		E	E		E	E	E	G	G		E	

[2] MCPA K mixes only. [3] Will not control CLEARFIELD canola varieties. [4] Spring seedlings only. [5] Not all products registered for use in oat. See glyphosate sections for details. [6] Not registered for control with all products. See glyphosate sections for details. [8] Seedlings and overwintered rosettes. • Registered for control, ratings not yet developed.

Table 3. Weed Control in Rye or Triticale

HERBICIDE	PAGE	Crop Tolerance - Rye	Crop Tolerance - Triticale	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Corn	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-D[3,4]	48	G									P		G	P	E		G	E		E	•	G	E	F	E	P	P		E	P
Achieve Liquid[3]	55	G	G	F	G			G																						
Achieve Liquid Gold[1,4]	57	G		F	G			G	E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Avenge[1]	75	G	G					G																						
Bromoxynil[1]	81	E	E						G				F				F	G		F	F	G		G	F					
Bromoxynil + MCPA[1,4]	84	E							E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Dicamba + 2,4-D[2,4]	92	F							G			G	G	P	E		G	E		E	G	G	E	G	E	F	F		G	F
MCPA[3,4]	155	E											G	P	E	F	F	E		E	F	F	E	P	E	P	P			P

[1] Fall rye only. [2] Spring rye only. [3] Fall and Spring rye. [4] Rye only; not registered for triticale.

Table 4. Weed Control in Winter Wheat

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Corn	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-Purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-D	48	G								P		G	P	E		G	E		E	•	G	E	F	E	P	P		E	P
Achieve Liquid	55	G	F	G			G																						
Achieve Liquid Gold	57	G	F	G			G	E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Avenge[3]	75	G					G																						
Bromoxynil	81	E						G				F				F	G		F	F	G		G	F					
Bromoxynil + MCPA	84	E						E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Dicamba + MCPA / 2,4-D	92	F						G			G	G	P	E	F[1]	G	E		E	G	G	E	G	E	F	F		G	F
Dicamba + mecoprop + MCPA	94	G						G	G		G			E	F	G	E		E	G	G	E	G	E	F	F		G	G
Dichlorprop + 2,4-D	96	G						G	G			G		E		G	E	F	E	G	G	E	G	E	F	F		G	G
DyVel	99	F						G			F	G		E	F	G	E		E	G	G	E	G	E	F	F		F	F
DyVel DSp	101	F						G			F	G		E		G	E	F	E	G	G	E	G	E	F	F		G	F
MCPA	155	E										G	P	E	F	F	E		E	F	F	E	P	E	P	P			P
Refine Extra Toss-N-Go / Refine SG	183	G						G		E	F			E	E	G	E	F	E	E	E	G	E	E	F	F		G[2]	G
Sencor[3]	194	F												F								F		G					

[1] MCPA K mixes only. [2] Will not control CLEARFIELD canola varieties. [3] Norstar only.

Table 5. Weed Control in Spring Wheat

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Corn	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada	Volunteer Flax	Volunteer Mustard, Canola	Volunteer Sunflowers
2,4-D	48	G								P		G	P	E		G	E		E	G	G	E	F	E	P	P		E	
Achieve Liquid	55	G	F	G			G																						
Achieve Liquid Gold	57	G	F	G			G	E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Adrenalin[11]	58		•	•			•	S		S	S	•	•	•	S	•	•		•	•	•	•	•	•				•	
Ally Toss-N-Go + 2,4-D	60	G						F		G				E	G	G	E		E	E	G	E	G	E	F	F		G	
Altitude FX[11]	62			•			•	•		•	•	•		•	•	•	•		•	•		•	•	•			•	•	•
Assert	65	G					G	P											G					G					
Attain	70	G						G		F	E	G	G[6]	E	F	E	E	E	E	E	G	E	G	E	P	P	E	E	•
Avadex MicroActiv / Extra Strength Avadex BW	72	G					G																						
Avenge[7,8]	75	G					G																						
Axial[7]	76			•			•																						
Basagran + 2,4-D[7]	78	E										G					G		E	F	G	E		E				E	
Bromoxynil	81	E						G				F				F	G		F	F	G		G	F					
Bromoxynil + 2,4-D	83	E						E	F			G		E		G	E		E	G	G	G	G	G				G	G
Bromoxynil + MCPA	84	E						E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Curtail M	90	G						G					G[6]	E		P	E		E	F		E	F	E	G	G		F	G
Dicamba + MCPA / 2,4-D	92	G						G			G	G	P	E	F[3]	G	E		E	G	G	E	G	E	F	F		G	F
Dicamba + mecoprop + MCPA	94	G						G	G		G			E	F	G	E		E	G	G	E	G	E	F	F		G	G
Dichlorprop + 2,4-D	96	G						G	G			G		E		G	E	F	E	G	G	E	G	E	F	F		G	G
DyVel	99	G						G			F	G		E	F	G	E		E	G	G	E	G	E	F	F		F	F
DyVel DSp	101	G						G			F	G		E		G	E	F	E	G	G	E	G	E	F	F		G	F
Everest	110	F		E[1]			G												•	•		•	•					•[5]	
Express Pack	113	G						F						E		G	E		E	G	G	E		E		F			G
Fortress	118	G		G			G	P								P	P			P	P								
Frontline	123	E						E		E	E		F[2]		G		E		E	E		E	E	E	F	F		E	
Frontline + 2,4-D	122							•		•	•	•	•[2]	•	S	•	•		•	•	•	•	•	•	S	S		•	•
Glyphosate (preharvest)	131				G								G[4]												F	G			
Harmony K[7]	139	G	G	G			E	G		E	F			E	E	E	E	F	E	E	E	G	E	E	F	F		G[5]	G
Harmony Total / Harmony SG	140	G	G	G			E	G		E	F			E	E	E	E	F	E	E	E	G	E	E	F	F		G[5]	G
Horizon	141	G	E	G			E																						
Horizon BTM	143	G	E	G			E	E	F			G		G		G	E		E	G	G	G	G	G	P	P		G	G
Linuron + MCPA amine	150	F		P				G		G		G		E	F	G	E		E	G		E	F	E					
Lontrel[7]	153	E						G																	F	G			
MCPA	155	E										G	P	E	F[3]		E		E			E		E	P	P			P
Mecoprop	159	G								E	G						E		E							P			
Prestige	173	E						E		G	E		G[6]	E	G	E	E	E	E	G		E	G	E	E	E	E	E	G
Prevail Liquid	174	G		G			G	F					G[6]	E		P	E		E	F		E	F	E	F	G		F	
Puma[120] Super	178	G	E	E			G																						
Refine Extra Toss-N-Go / Refine SG	183	E						G		E	F			E	E	E	E	F	E	E	E	G	E	E	F	F		G[5]	G
Refine M	185	E						G		E	F			E	E	E	E	F	E	E	E	G	E	E	F	F		G	G
Sencor	194	F							G	G					F		G		G	F	G		G	G				G	
Spectrum	201	E						E		E	E		F[2]	E[6]	E		E		E	E		E	E	E	G	G		E	
Sundance	203	G		F	F		G			E	E								E	E				E				G[5]	
Trifluralin (foxtail control)	209	E		G																									
Triton C	214	E						G		E	•			E	E	E	E	F	E	E	E	G	E	E	F	F		G[5]	G
Trophy	216	E									G	G		E	F	E	E		E	E		G	F	G			E	E	•
Unity[9]	219	E						G		G	G			G	E	G	G		E	G		G	G	E				G	

[1] Green foxtail only. [2] Spring seedlings and overwintered rosettes. [3] MCPA K mixes only. [4] Not registered for control with all products. See glyphosate sections for details. [5] Will not control CLEARFIELD canola varieties. [6] Spring seedlings only. [7] Not registered for durum wheat. [8] Not recommended for all spring wheat varieties. Check product listing for details. [9] Not for use in Manitoba. [10] Tank mix with 2,4-D ester when applying to durum wheat. [11] For use on CLEARFIELD wheat varieties only.
• Registered for control, ratings not yet developed. S - Suppression

Table 6. Weed Control in Corn

HERBICIDE	PAGE	Barnyard Grass	Volunteer Cereals	Foxtail, Green	Foxtail, Yellow	Wild Oats	Quackgrass	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed Annual Species, Lady's-thumb	Sow Thistle (Perennial)	Stinkweed	Sunflower, Volunteer	Thistle, Canada	Volunteer Canola
2,4-D	48									P		G	P	E	G	E	E	G	G	E	F	P	E	P	P	E
Accent	53	•		•	S	•	•																			
Atrazine	68					•		•								•	•	•			•					
Basagran / Basagran Forté	78									•		•				•	•	S	S	•	•		•		S	•
Bromoxynil	81							G				F			F	G	F	F	G		G		F			
Bromoxynil + MCPA	84							•	•			•		•	•	•	•	•	•	•	•		•	•		•
Dicamba	92							•			•				•	•	•	•			•	S			S	
Dicamba + 2,4-D amine	92							•			•	•	S	•	•	•	•	•	•	•	•	S	•	•	S	•
Dual II Magnum	98	•		•	•													S								
DyVel DSp	101							G			F	G		E	G	E	E	G	G	E	G	F	E		F	G
Eradicane	107	•	•	•	•	•	S			•						•		•								
Frontier	120			•																						
Glyphosate[1, 4]	134	E	E	E	E	E	F	G	G	E	E		F	E	E	E	E	E	E	E	E	F	E	E	F	
Laddok	145									•		•				•	•	•	•		•					
Liberty 200 SN[3]	149	•		•	•	•	S	•		•		•				•	•	•		•	•	•	•		S	
MCPB + MCPA	158															•	•	•		•		S	•		S	•
Option 35 DF/ Option 2.25 OD	166	•		•	•					•						•	•	•								
Primextra II Magnum	175	•		•	•			•								•	•	•			•					
Shotgun	197							•								•	•	•			•					
Ultim[2]	217	•	•	•	•	•	•											•								

• Controlled S – Suppression
[1] For use on Roundup Ready varieties only. [2] See product page for registered corn varieties. [3] For use on Liberty 200 SN tolerant corn varieties only.
[4] Not all glyphosate products are registered for use on Roundup Ready Corn.

Table 7. Weed Control in Peas

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp Nettle	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's -purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada
Assure II	67	E	G	E	F	E	E	G																		
Avadex (Extra Strength BW)	72	E						G																		
Basagran / Basagran Forté	78	F									F	F	F					F	F	P	F	F	F	F		P
Clethodim	87	E	E	E	F	E	E	G																		
Edge	104	G	E	E		P	F	G	G		G	P				P	G	E		G	P		P			
Fusion	125	E	G	E[1]		E	E	G																		
Glyphosate (preharvest)	135				G									G[2]											F	G
MCPA Sodium Salt / Amine	155	F													P			P	G			P		P		
MCPB + MCPA	158	F														F		G	G	G		G		G	P	P
Odyssey	163	G	G	E[1]		G	G	G	F		E	E			E	S	P	P	E	E	E	E	G	E		
Odyssey DLX	164		•	•[1]		•	•	•	F		E	E			E	F	P	P	E	E	E	E	G	E		
Poast Ultra	169	E	E	E	F	E	E	G																		
Pursuit	180	G		F[1]				F	G		G	G				G		P	E	G		G	G	E		
Pursuit Ultra	182	G	E	E	F	E	E	G	F		G	G				F			E	G			F	G		
Sencor	194	F									G					F		G	G				G	G		
Solo	200		•	•[1]		•	•	•	S			S					S	•	•	•		•	•	•		
Trifluralin (broadleaf & grassy weeds)	211	G	G	G				F	F		G							G		G	G					
Venture L	222	E	E	F	F	E	E	G																		

[1] Green foxtail only. • Registered for control, ratings not yet developed. S – Suppression
[2] Not registered for control with all products. See glyphosate sections for details.

Table 8. Weed Control in Other Pulses

	CROP							ANNUAL WEEDS																			PERENNIALS			
HERBICIDE	PAGE	Bean, Dry	Fababean	Lentil	Chickpea	Soybean	Sweet White Lupin	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Barley	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Nightshade, Hairy	Pigweed, Redroot	Russian Thistle	Shepherd's Purse	Smartweed, Annual Species	Stinkweed	Canada Thistle	Dandelion	Perennial Sow-thistle	Quackgrass
Assure II	67	X[6]		X	X	X		G	E	•	E	E	G																		F
Basagran / Basagran Forté	78	X[1]	X			X									F	F	F			F	F	F	P	F	F	F	F	P				
Clethodim	87	X		X	X	X		E	E	E	E	E	G																			
Dual II Magnum	98	X[7]				X	X	G	G	G													P									
Edge	104	X[1]	X	X[8]		X		E	E	E	P	F	G	G	G	P		P	G	E			G	P		P						
Eptam	106	X						G	G	G	F	F	G		G					G			G									
Frontier	120	X[1]							•																							
Fusion	125			X				G	E		E	E	G																			
Glyphosate (preharvest)[4]	131	X		X	X																							G	G[4]	F	G	
Liberty (desiccant only)	146			X																												
Linuron	150					X[2]	X[2]	S	S	S				•	•								•		•	•	•					
Odyssey[9]	163			X[9]				G	G		G	G	G	F	E	E		S	P	P	E		E	E	E	G	E					
Odyssey DLX[9]	164			X[9]				•	•		•	•	•	F	E	E		S	P	P	E		E	E	E	G	E					
Pinnacle	168					X														•	•		•			•						
Poast Ultra	169	X	X	X	X	X		E	E	E	E	E	G																			F
Pursuit	180	X[3]				X																G										
Reflex + Basagran	187	X[5]													F					•	•		•		•	•	•					
Sencor (post-emergence)	194			X	X										F			F		F	F					F	F					
Sencor + Treflan (PPI)	194		X			X		G	G	G			F	F	G			F		G	G		G	G	G	G	G					
Trifluralin (broadleaf and grassy weeds)[4]	211	X	X	X		X		G	G	G			F	F	G					G			G	G								
Venture L	222			X		X	X	E	F	F	E	E	G																			F

[1] White and kidney beans only. [2] Pre-emergent surface treatments only. [3] Pinto, pink and red beans only. (Refer to Pursuit section for full list of weeds controlled).
[4] Not registered for control with all products. See product section for details. [5] For use on navy beans in the Red River Valley of Manitoba. Does not include Basagran Forté.
[6] Not all dry bean types have been tested for tolerance to this herbicide. [7] White, kidney and pinto beans only. [8] Fall applications only.
[9] For use ONLY on CLEARFIELD lentil varieties. • Registered for control, ratings not yet developed.
S - Suppression.

Table 9. Weed Control in Flax and Solin (Low Linolenic Acid Varieties). Not all products are registered for use on Solin.

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Quackgrass	Volunteer Cereals	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp Nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada
Assure II[1]	67	E	G	E	•	F	E	G																			
Avadex MicroActiv / Extra Strength Avadex BW	72	E						G																			
Basagran[1] / Basagran Forté	78	F									F	F	F					F		F	P	F	F	F	F		F
Bromoxynil[1]	81	F							G				F				F	G		F	F	G		G	F		
Bromoxynil + MCPA[1]	84	F							E	F			G		G		G	E		E		G	G	F	G	P	P
Clethodim[1]	87	E	E	E	E	F	E	G																			
Curtail M[1]	90								F					G[2]	E			E		E	P		E	P	E	G	G
Eptam[3]	106	F	G	G	G		F	G			G							G			G						
FlaxMax DLX	116			•			•	•	F					G[2]	E			E		E	P		E	P	E	G	G
FlaxMax Ultra	117	F	E	E	E		G	G	F					G[2]	E			E		E	P		E	P	E	G	G
Fortress	118	G		G	G			G	P								P	P			P	P					
Fusion[1]	125	E	G	E			E	G																			
Glyphosate (preharvest)[4]	131					G								G[5]												F	G
Lontrel[1]	153	E							G																	F	G
MCPA / MCPA K	155	F											G	P	E	F		E		E			E		E	P	P
Poast Ultra[1]	169	E	E	E	E	F	E	G																			
Trifluralin (broadleaf and grassy weeds)[6]	211	F	G	G	G			F	F		G							G			G	G					
Venture L[1]	222	E	E	F	F	F	E	G																			

[1] Registered for use on Solin (low linolenic acid varieties). [2] Spring seedlings only. [3] Not recommended for use on flax in Saskatchewan. [4] Not all products registered for use in flax. See glyphosate sections for details. [5] Not registered for control with all products. See glyphosate sections for details. [6] Fall application only.

Table 10. Weed Control in Canola

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's Purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada
Absolute[2]	52	G	G	E			G	G	G	G		E	G			E	E	P	P		E	E	E	E	G	E	G	G
Assure II	67	E	G	E	•	F	E	E	G																			
Avadex MicroActiv / Extra Strength Avadex BW	72	E							G																			
Clethodim	87	E	E	E	E	F	E	E	G																			
Eclipse[4]	103	G		E		F	E	E	E	G	G	E	E		F		E	E	E		E	E	E	E	•	E	G[7]	G[7]
Edge	104	G	E	E	E		P	F	G	G		G	P				P	G	E			E	P		P			
Fortress	118	G		G	G				G	P								P	P			P	P					
Fusion	125	E	G	E			E	E	G																			
Glyphosate[4,5]	133	E	E	E	E	F	E	E	E	F	G	E	E		F	E	E	E	E	G	E	E	E	E	E	E	F	F
Glyphosate (preharvest)	131					G									G[5]												F	G
Liberty[1]	146	G	G	G		F	F[3]	G[3]	G	G		G	G		F	G	G	G	G	G	G	G	G	G	G	G	G	F
Lontrel	153	G								G																	F	G
Muster Gold II	160	G	G	E	•	F	E	E	G							G	G				G	P			G	F		
Muster Toss-N-Go	161	G														G	G				G	P			G	F		
Odyssey[2]	163	G	G	E			G	G	G	F		E	E			E	G	P	P		E	E	E	E	G	E		
Poast Ultra	169	E	E	E	E	F	E	E	G																			
Pursuit[2]	180	E		G			P	P	F	G		G	G						P		E	G			G	E		
Pursuit Ultra[2]	182	E	E	E	E	F	E	E	G	F		G	G				F				E	G			F	G		
Solo[2]	200		•	•			•	•	•	S			S					S	•		•	•		•	•	•		
Trifluralin	211	E	G	G	G				F	F		G							G			G	G					
Venture L	222	E	E	F	F	F	E	E	G																			

[1] For use **only** on Liberty Link varieties. [2] For use **only** on CLEARFIELD canola varieties. [3] Ratings based on 1.35 L / acre rate of Liberty. Control may be reduced at lower rates. [4] For use **only** on Roundup Ready canola varieties. [5] Not registered for control with all products. See glyphosate sections for details. [7] Season long control.
• Registered for control, ratings not yet developed. S – Suppression.

Table 11. Weed Control in Potatoes*

HERBICIDE	PAGE	Barnyard Grass	Foxtail, Green and Yellow	Volunteer Canola	Volunteer Corn	Volunteer Barley	Volunteer Wheat	Wild Oats	Quackgrass	Chickweed	Dandelion	Hemp-nettle	Lamb's-quarters	Mustard, Wild	Nightshade	Pigweed, Redroot	Pigweed, Prostrate	Purslane	Smartweed (Annual)	Shepherd's-purse	Stinkweed
Clethodim	87	•	•		•	•	•	•													
Dual II Magnum	98	•	•												2	S					
Eptam 8-E	106	•	•			•	•	•	S	•			•		3	•	•	•			
Glyphosate (preplant use only)	128		•	•[1]	•[1]	•	•	•	•		•	•	•	•	•	•			•	•	•
Gramoxone (pre-emergent use only)	137	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
Liberty (desiccant only)	146																				
Linuron (pre-emergent use only)	150	S	•							•			•			•	•	•	•	•	•
Poast Ultra	169	•	•		•	•	•	•	S												
Prism	177	•	•						•				S			•					
Reglone Desiccant	188																				
Sencor	194			•						•		•	•	•		•			•	•	•
Venture L	222	•	•		•	•	•	•	S												

• Controlled S – Suppression [1]Will control non-Roundup Ready varieties only. [2]American and Eastern black nightshades.
[3]Hairy nightshade

***Note:** Before using any pesticides on potatoes, consult the list of Agricultural Pesticides Approved for Use, available from Simplot Canada and McCain Foods (Canada).

Table 12. Weed Control in Sunflowers

HERBICIDE	PAGE	Crop Tolerance	Barnyard Grass	Foxtail, Green and Yellow	Quackgrass	Volunteer Barley	Volunteer Wheat	Wild Oats	Buckwheat, Wild	Catchfly, Night-flowering	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mallow, Round-leaved	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada
Assert	65	F																		G				G		
Clethodim	87	E	E	E	F	E	E	G																		
Edge	104	G	E	E		P	F	G	G		G	P				P	G	E			E	P	P			
Eptam 8E	106	G	G	G		F	F	G			G							G			G					
Muster Toss-N-Go	161														G	G				G			G	F		
Poast Ultra	169	E	E	E	S	•	•	G																		
Trifluralin	211	E	G	G				F	F		G							G			G	G				
Venture L	222	E	E	F	F	E	E	G																		

• Registered for control, ratings not yet developed. S - Suppression.

Table 13. Weed Control in Special Crops

	CROP							ANNUAL WEEDS																				PERENNIALS			
HERBICIDE	PAGE	Canaryseed	Safflower	Caraway	Coriander	Buckwheat	Mustard	Barnyard Grass	Foxtail, Green	Foxtail, Yellow	Volunteer Wheat	Wild Oat	Buckwheat, Wild	Catchfly, night-flowering	Chickweed	Cleavers	Cocklebur	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Russian Thistle	Shepherd's Purse	Smartweed, Annual Species	Stinkweed	Volunteer Barley	Volunteer Flax	Volunteer Mustard, Canola	Canada Thistle	Dandelion	Perennial Sow-thistle	Quackgrass
Avadex MicroActiv / Extra Strength AvadexBW	72	✓[1]					✓					G																					
Avenge	75	✓										G																					
Bromoxynil	81	✓											G				F			F	G	F	F	G		G	F						
Bromoxynil + MCPA	84	✓											E	F			G	G		G	E	E	G	G	G	G	G			G	P		P	
Clethodim	87				✓[5]		✓	E	E	E	E	G																E						F
Curtail M	90	✓											F					E		P	E	E	P		E	P	E			F	G	G[4]	G	
Dicamba + MCPA	92	✓											G			G	G	E	F		E	E	G	G	E	G	E		P	G	F	P	F	
Dicamba + Mecoprop + MCPA	94	✓											G	G		G		E	F	G	E	E	G	G	E	G	E				F		F	
Edge	104		✓	✓	✓		✓[2]	E	E	E	F	G	G		G	P			P	G	E		G	P		P		P						
Fortress	118						✓		G	G		G	P							P	P		P	P										
Fusion	125						✓	G	E		•	G																						
Lorox L	150			✓	✓																	•											
Muster Toss-n-Go	161						✓[3]											G	G			G				G	F							
Poast Ultra	169		✓	✓	✓	✓	✓	E	E	E	E	G																E						F
Prestige	173	✓											E		G	E		E	G	E	E	E	G		E	G	E		E	E	E	G[4]	E	
Trifluralin	211		✓				✓	G	G	G		F	F		G						G		G	G										
Trophy	216	✓											S			•	•	•	•	•	•				•	S	•		•	•				
Venture L	222						✓	E	F	F	E	G																E						F

[1] Granular formulation only. [2] Yellow mustard only. [3] Brown and oriental only. [4] Spring seedlings only. [5] Centurion only.

• Registered for control, ratings not yet developed. S - Suppression.

Table 14a. Herbicides for Use Before Seeding or After Seeding but Prior to Crop Emergence

HERBICIDE	RATE L/acre	Pre-seeding	Pre-emergent	Barley	Canaryseed	Canola	Chickpea	Corn, Field	Corn, Sweet	Dry Beans	Field Pea	Flax	Forage Grasses	Lentil	Oats	Rye	Soybean	Wheat
Amitrol	1.7	✓		✓		✓		✓		✓	✓						✓	✓
Glyphosate	glyphosate[1]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Glyphosate + Express TNG/SG	glyphosate[1] + 4 g	✓		✓											✓			✓
Glyphosate + Pardner	glyphosate[1] + 0.51	✓	✓	✓											✓			✓
Prepass	40 acres/case	✓		✓											✓			✓
Glyphosate + 2,4-D	glyphosate[1] + 0.23-0.58	✓	✓	✓												✓		✓
Glyphosate + Buctril M	glyphosate[1] + 0.2-0.4	✓		✓	✓			✓	✓			✓	✓		✓	✓		✓
Glyphosate + MCPA	glyphosate[1] + 0.2-0.28	✓		✓			✓	✓	✓		✓	✓		✓	✓	✓		✓
Glyphosate + MCPA	glyphosate[1] + 0.2-0.4	✓		✓				✓	✓			✓			✓	✓		✓
Rustler	1.0-1.3	✓		✓				✓							✓	✓		✓

[1] Rates of application of glyphosate vary among brands. Consult Table 10 on page 135 for specific application rates of glyphosate.

Table 14b. Weed Control Before Seeding or After Seeding but Prior to Crop Emergence

HERBICIDE	RATE L/acre	PAGE	Brome, Downy	Buckwheat, Wild	Dandelion	Flixweed	Foxtail Barley	Foxtail, Green	Hemp-nettle	Kochia	Lady's-thumb	Lamb's-quarters	Mustard, Wild	Narrow-leaved Hawk's Beard	Pigweed, Redroot	Quackgrass	Russian Thistle	Shepherd's Purse	Stinkweed	Volunteer Cereals	Volunteer Canola (including Roundup Ready varieties)	Volunteer Flax	Wild Oats
Amitrol 240	1.7 L	63			•																		
Glyphosate[1] + 2,4-D	glyphosate[1] + 0.23-0.58	135	•	•		•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•
Glyphosate[1] + Buctril M	glyphosate[1] + 0.2-0.4	135	•	•		•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•
Glyphosate + Express TNG/SG	glyphosate[1] + 4 g	135		•	•	•	S	•	•	•		•	•	S	•		•	•	•	•	•		•
Glyphosate[1] + MCPA	glyphosate[1] + 0.2-0.4	135	•	•		•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•
Glyphosate + Pardner	glyphosate[1] + 0.51	135		•				•		•	•	•	•				•		•	•	•		•
Glyphosate	glyphosate[1]	128	•	•	S	•	S	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
Prepass	40 acres/case	171	•	•	S	•		•	•	S	•	•	•	•	•		•	•	•	•	•		•
Rustler	1.0-1.3	193	•	•		•		•		•	•	•	•		•		•		•	•			•

• Controlled S – Suppression [1] Rates of application of glyphosate vary among brands. Consult Table 10 on page 135 for specific application rates of glyphosate.

Table 15. Weed Control in Summerfallow (Chem Fallow)

HERBICIDE	RATE L/acre	PAGE	Brome, Downy	Buckwheat, Wild	Dandelion	Flixweed	Foxtail Barley	Foxtail, Green	Kochia	Lady's-thumb	Lamb's-quarters	Mustard, Wild	Pigweed, Redroot	Quackgrass	Russian Thistle	Stinkweed	Thistle, Canada	Thistle, Sow (Perennial)	Volunteer Cereals	Volunteer Canola	Wild Oats
Dicamba + 2,4-D	0.12 + 0.45	92		•		•			•	•	•	•	•		•	•	S	S			
Dicamba + mecoprop + MCPA	0.81	94		•		•			•	•	•	•	•		•	•	S	S		•	
DyVel DSp	0.71	101		•		•			•	•	•	•	•		•	•	S			•	
Express Pack	40 acres/pack	113				•										•					
Glyphosate	0.5-1.0	127	•	•		•	S	•	•	•	•	•	•		•	•			•	•[2]	•
Glyphosate + 2,4-D amine (500 g/L)	glyphosate[3] + 0.49	135				•		•	•	•	S	•	•		S	•			•	•	•
Glyphosate + dicamba	glyphosate[3] + 0.12	135		S		•		•	•	•	•	•	S		•	•			•	•[2]	•
Glyphosate + bromoxynil	glyphosate[3] + 0.51	135		•				•	S	•		•	S			•			•	•	S
Lontrel	0.34	153		•													•	S			
Rustler	1.0-1.3	193	•	•		•	S	•	•	•	•	•	•		•	•			•	•[2]	•

• Controlled S – Suppression [2] Not including Roundup Ready canola. [3] Rates of application of glyphosate vary among brands. Consult Table 10 on page 135 for specific application rates of glyphosate.

Table 16. Fall Weed Control in Stubble

HERBICIDE	PAGE	Flixweed	Narrow-leaved Hawk's Beard	Shepherd's-purse	Stinkweed	Canada Thistle	Quackgrass	Dandelion
2,4-D	48	•		•	•	S		S
Amitrol 240	63					S		
Dicamba	92					S		S
Dicamba + Glyphosate	92	•		•	•	S	S	
Dicamba + mecoprop + MCPA	94	•		•	•	S		
DyVel DSp	101	•		•	•	S		
Glyphosate	127					S	•	•
MCPA	155	•		•	•	S		S

• Controls fall seedlings less than 2 inches (5 cm) across.
S – Suppression. Levels of suppression vary depending on the product and growing conditions in the fall. Regrowth and in-crop treatments can be expected.

Table 17. Weed Control in Grass Pastures and Hayfields

HERBICIDE	RATE L/acre or kg/acre	PAGE	Absinth	Bindweed, Field	Burdock	Canada Thistle	Dandelion	Dock, Curled	Daisy, English	Flixweed	Foxtail Barley	Gumweed	Hawk's Beard, Narrow-leaved	Knapweed	Leafy Spurge	Nodding Thistle	Poplar	Pussy Toes	Red Bartsia	Sage, Pasture	Sow-thistle, Perennial	Snowberry	Stinkweed	Tansy	Wild Rose	Willow	Wormwood, Biennial
2,4-D (500 g/L)	0.57 - 1.82	48	□	□	•	□	□	•		•		□			□	□	□	□	•	□	□	□	•				
2,4-DB	0.71 - 1.72	50		□		□		■					■								□		•				
Dicamba	0.85 - 1.86	92		□		□	□	□	□					□	□					□	□			□			
Dicamba + 2,4-D	0.85 + 0.89 - 1.62	92	□	□	•	□	□	□	□	•		□			□	□	□		•	□	□	•	•	□	•	□	
Escort	0.010 - 0.012	109				□	•														□	•		•	■		
Grazon	2.8	138			•	•	•	•																			
Kerb	0.36 - 0.45	144									•																
MCPA (500 g/L)	0.7 - 1.9	155		□		□	□	□		•		□			■						□		•	□			•
MCPB + MCPA	1.11 - 1.72	158		□																	□		•				
Remedy EC	1 - 8	190		■	•		•	•									•								•	•	
Restore	0.2 + 1.0	191	□		•	□	□	•		•		□		□							□	□		□			
Tordon 22K	0.45 - 3.64	205		■		•								•	■					•							

• Controlled. ■ Controlled by the highest rate within this range. □ Top growth suppression.

Table 18. Weed Control in Shelterbelts

	USE				SHELTERBELT SPECIES												WEEDS																		
HERBICIDE	PAGE	Before Planting	After Planting (New & Established)	Established	American Elm	Birch	Caragana	Crabapple	Green Ash	Juniper	Lilac	Manitoba Maple	Poplar	Scots Pine	Siberian Elm	Willow	Barnyard Grass	Foxtail, Green and Yellow	Wild Oats	Buckwheat, Wild	Chickweed	Cleavers	Cocklebur	Dandelion	Flixweed	Hemp-nettle	Kochia	Lamb's-quarters	Mustard, Wild	Pigweed, Red Root	Quackgrass	Russian Thistle	Shepherd's-purse	Smartweed, Annual Species	Stinkweed	Thistle, Sow (Perennial)	Thistle, Canada
Amitrol 240	63			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Casoron	86		•		•		•	•	•	•	•	•			•	•		•		•	•							•	•	•		•	•	•		
Glyphosate	130	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Gramoxone	137		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•		
Linuron	150			•	•		•		•			•		•	•	•	•	•		•	•						•	•		•			•	•		
Simazine	199			•	•		•		•			•			•		•	•[1]	•	•								•					•				
Trifluralin Liquids	211	•		•	•		•		•					•	•		•	•	•	•	•							•		•		•					

[1] Yellow foxtail only.

Products Available as Prepackaged Tank Mixes

Product Name (Manufacturer)	Component 1 or A	Component 2 or B	Component 3 or C	Crops	Weeds Controlled	Area Treated	Cost per acre (2006)
Absolute (BASF Canada)	Odyssey	Lontrel	Merge (adjuvant)	CLEARFIELD canola	See component products	40 acres or 16 ha	$33.65
Achieve Liquid Gold (Dow AgroSciences)	Achieve Liquid	Buctril M	Turbocharge (adjuvant)	Wheat (spring, durum, winter), barley	See the weeds of the component products plus tame buckwheat	20 acres or 8 ha	$24.08
Eclipse (Dow AgroSciences)	Lontrel (Eclipse A)	Vantage (Eclipse B)		Roundup Ready Canola varieties	See component products	30 acres	$14.90
FlaxMax Ultra (BASF Canada)	Curtail M	Poast Ultra	Merge (adjuvant)	Flax	See component products	20-27 acres or 7.2- 9.3 ha	$17.11 to $23.10
Harmony Total /SG (E. I. duPont Canada)	Refine Extra /SG	Horizon	Score (adjuvant)	Spring wheat (including durum)	Weeds controlled by Refine Extra plus wild oat, green foxtail	40 acres or 16 ha	$23.80 (Total) $24.28 (SG)
Harmony K	Refine Extra	Horizon plus Score adjuvant	dicamba	Spring wheat (NOT including durum)	Weeds controlled by Refine Extra plus wild oat, green foxtail & group 2 resistant kochia	40 acres or 16 ha	$24.28
Horizon BTM (Syngenta)	Buctril M	Horizon	Score (adjuvant)	Spring wheat (including durum)	Weeds controlled by Buctril M plus wild oat.	20 acres or 8 ha	$24.71
Muster Gold II (E. I. duPont Canada)	Muster	Assure II	Merge (adjuvant)	Canola, including herbicide tolerant canola	See component products	40 acres or 16 ha	$22.11
Prevail Liquid (Dow AgroSciences)	Achieve Liquid	Curtail M	Turbocharge (adjuvant)	Spring wheat (including durum), barley	Wild oat, green foxtail, persian darnel; weeds controlled by Curtail M, plus Russian thistle	20 acres or 8 ha	$27.48
Pursuit Ultra (BASF Canada)	Poast Ultra	Pursuit	Merge (adjuvant)	Field pea, CLEARFIELD canola varieties	See Poast Ultra plus Pursuit tank mix	40 acres or 16 ha	$24.47
Refine M (E. I. duPont Canada)	Refine Extra	MCPA Ester		Spring wheat (including durum), barley, oat	See component products	80 acres or 32 ha	$7.95

Note: *See the component products listed for information concerning staging, application information, safety precautions, the effect of weather and grazing, recropping, harvest interval and storage precautions.*

The more stringent recommendation of the two products should be followed. Mix products in the order listed.

Herbicide Directory

2,4-D

Herbicide Group – 4
(Refer to page 27)

Company and Formulation:

	PCP #			
	Amine*		Ester**	
	500	600	600	700
IPCO	–	17511	–	20310, 27819
Nufarm Agriculture	14725†	14726	14739†	23508, 27820
United Agri-Products	9547†	5931	9561†	23563, 27818

* formulated as a solution.
** formulated as an emulsifiable concentrate.

† These older formulations are no longer produced by the manufacturers, but quantities may still remain in the retail system. These products may be removed from future editions.

Crops, Rates and Staging:

Application rates for individual products may vary from those listed. Refer to the label for product specific use rates. Rates greater than those listed may cause crop injury.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

CROP	MAXIMUM SAFE RATE (L/ACRE)	STAGE
Wheat, barley, spring rye	0.45 (500 g/L) 0.38 (600 g/L) 0.32 (700 g/L)	4 leaf to early flag leaf.
Fall rye,-winter wheat*	0.45 (500 g/L) 0.38 (600 g/L) 0.32 (700 g/L)	In spring, apply after winter cereals begin grow but before emergence of the flag leaf.
Corn*	0.42 (500 g/L) 0.35 (600 g/L)	Apply as an overall spray before corn is 6 inches (15 cm) tall and before the 6-leaf stage. After 6 inches (15 cm) use a directed spray.
Seedling and established grasses for forage and seed production*	0.45 (500 g/L) 0.38 (600 g/L) 0.32 (700 g/L)	Apply from the 3 leaf stage to emergence of the flag leaf of seedling grasses. For established grasses for seed production, apply in spring up to emergence of the flag leaf.
Established forage grass *(not for seed production)**	0.93 (500 g/L) 0.78 (600 g/L) 0.67 (700 g/L)	Apply in spring up to emergence of the flag leaf of established grasses, or in the fall after harvest.
Established grass pastures	1.81 (500 g/L) 1.51 (600 g/L) 1.30 (700 g/L)	No restrictions, apply when weeds are actively growing. For control of brush species, apply at time of rapid growth (usually May to mid-June, and September prior to colour change).
Turf*	0.91 (500 g/L) 0.76 (600 g/L)	Apply in spring and early September on established turf. Do not use on bent grasses.
Fall stubble* – Canada thistle suppression	0.91 (500 g/L) 0.76 (600 g/L) 0.65 (700 g/L)	Canada thistle (suppression only) -Apply when thistle plants are actively growing and have 6 to 8 inches (15 to 20 cm) of new growth. Regrowth will be present the following spring and in-crop treatments will be required.

* Note: Registered for use only with certain brands of 2,4-D; use of non-registered products is at the risk of the user.

Weeds, Rates and Staging:

Apply at lower rates when weeds are small (2 to 4 leaf stage) and actively growing. Higher rates are needed when weeds are larger, in heavy populations, or growing under stressful conditions (excessively cold, hot, dry or wet). Lower rates may be applied in late fall to control winter annual weeds.

Note: The rates listed differ slightly from product to product. Check individual product labels for exact use rates.

Susceptible Weeds:
0.27 to 0.45 L / acre (500 g / L)
0.22 to 0.38 L / acre (600 g / L)
0.19 to 0.32 L / acre (700 g / L)

Bluebur
Burdock
Cocklebur
False flax
Flixweed (late fall application or spring seedlings)
Goat's-beard
Kochia
Lamb's-quarters
Mustards (except dog and tansy mustard)
Narrow-leaved hawk's-beard (fall application to seedlings or spring application at 1-2 leaf stage)
Plantain
Prickly lettuce
Ragweed (common, false and giant)
Russian pigweed
Russian thistle
Shepherd's-purse**
Stinging nettle
Stinkweed**
Sweet clover
Thyme-leaved spurge
Volunteer canola (including all herbicide tolerant varieties)
Wild radish
Wild sunflower

Harder to kill weeds:
0.48 to 0.74 L / acre (500 g / L)
0.40 to 0.61 L / acre (600 g / L)
0.34 to 0.53 L / acre (700 g / L)

Annual sowthistle
Blue lettuce*
Burdock (top growth only of bolting plants)
Canada thistle***
Common chickweed
Common groundsel**
Common peppergrass
Dandelion*
Flixweed (spring prior to bolting)
Knotweed
Lady's-thumb
Leafy spurge*
Mustard (dog & tansy)
Narrow-leaved Hawk's-beard (spring prior to bolting)
Oak-leaved goosefoot
Pineappleweed
Prostrate pigweed
Purslane
Redroot pigweed
Russian thistle
Sheep sorrel
Tumble pigweed

Top Growth Control only (at rates for harder to kill weeds):
Biennial wormwood
Bull thistle
Buttercup
Curled dock
Field bindweed
Gumweed
Hedge bindweed
Hoary cress
Horsetail
Mouse-eared chickweed
Perennial sow-thistle
Russian knapweed
Tartary buckwheat
Volunteer sunflower

* Control of seedlings at rates given above and top growth control only of established plants.

** Spring seedlings. Winter annual weeds - apply in late fall or early spring prior to bolting.

*** Suppression only - Apply when Canada thistle plants are actively growing and have 6 to 8 inches (15 to 20 cm) of new growth. Regrowth will be present the following spring and in-crop treatments will be required.

Cost (2006 suggested retail prices):

Amine 500 g/L - $6.60 to $6.80 per L
Amine 600 g/L - $7.80 to $7.93 per L
LV Ester 600 g/L - $8.05 to $9.36 per L†
LV Ester 700 g/L - $10.25 to $11.50 per L

† Prices on older formulations have not been established by the manufacturer since 2005 and actual retail price may differ from those listed here.

Formulation Characteristics:

Formulation	Risk of-Vapour Drift	Activity on Weeds	Risk of-Crop Injury
LV Ester	Medium	Fast	Medium
Amine	Very Low	Medium	Low

Application Information:

Water Volume: Minimum 20 L per acre - ground application. Water rates depend on product and use. Consult label for details.

Higher application volumes (40 L / acre or greater), reduce the risk of crop injury.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Best weed control occurs when temperatures are above 21°C (daytime) or 10°C (nighttime) and humidity is above 70 percent. Do not apply if temperature exceeds 27°C.

Tank Mixes:

Mixes listed may not occur on all products labels. Check individual product labels for registered mixes.

Note: Following list is for mixes listed on 2,4-D labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Herbicides:
Spring wheat (including durum), winter wheat and barley:
Avenge (2,4-D ester only)
Refine Extra* (2,4-D ester only)
Spring wheat (including durum), and barley:
Assert (2,4-D ester only)
Express TNG (2,4-D ester only)
Wheat and barley:
Banvel (2,4-D amine only)
Ally* (2,4-D ester only)
* The addition of a non-ionic surfactant is required.

Fertilizers: None registered.

Insectcides: None registered.

Fungicides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: 2,4-D amine - within 4 hours will reduce control. 2,4-D LV ester - within 2 hours will reduce control.

Grazing: Do not permit lactating dairy animals to graze fields within 7 days of application. Do not harvest forage or cut for hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.
Recropping: No restrictions the year after treatment.

Aerial Application: Some formulations may be applied by air. Check the label for detailed instructions.

Storage: 2,4-D LV ester may be frozen. 2,4-D amine requires heated storage.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

 Warning Poison

 Danger Poison - Ester 700 Formulations

2,4-DB

Herbicide Group – 4
(Refer to page 27)

Company:

IPCO (Cobutox 600†, Cobutox 625)
Nufarm Agriculture (Embutox 625)
United Agri Products (Caliber 400† Caliber 625)

Formulations:

Cobutox 600 (PCP#22404)†: 600 g/L 2,4-DB formulated as an emulsifiable concentrate. Container size -10 L.

Caliber (PCP#27910), Cobutox (PCP#27911) and Embutox 625 (PCP#19217†, 27912): 625 g/L 2,4-DB formulated as an emulsifiable concentrate. Container size -10 L.

Caliber 400 (PCP#16736)†: 400 g/L 2,4-DB formulated as an emulsifiable concentrate. Container size -10 L.

† These older formulations are no longer produced by the manufacturers, but quantities may still remain in the retail system. These products may be removed from future editions.

Crops and Staging:

NOTE -When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

CROP	STAGE
Seedling alfalfa, bird's-foot trefoil*	1 to 4 trifoliate leaf stage
Clover (alsike, red, white, Dutch but NOT sweet clover)*	As soon as possible after emergence of the 1st trifoliate leaf
Wheat, barley or oats**	5 leaf to emergence of the flag leaf
Field corn	15 inches (38 cm) to prior to tassling using drop nozzles.
Pastures containing forage legumes	After cutting or grazing and regrowth less than 3 inches (7.5 cm)

* With or without a cereal cover crop.
** Caliber 400 not registered for use on oats.

Seedling Forage Grasses*:
Apply from 2 to 4 leaf stage of:

Bromegrass (smooth)	Timothy
Fescue (creeping red, meadow, tall)	Wheatgrass (crested, intermediate, streambank, tall)
Orchard grass	

* Not for seed production. Not for feeding in the establishment year.

Weeds and Staging:

Weeds controlled from the 2 to 4 leaf stage at lower recommended rates include:

Ball mustard	Shepherd's-purse
Lamb's-quarters	Stinkweed
Ragweed	Wild mustard
Redroot pigweed	Wormseed mustard

Weeds controlled at higher recommended rates include:

WEED	STAGE
Bull thistle	Rosette
Canada thistle*	6 in. (15 cm) to early bud
Chicory	Rosette
Curled dock**	Young and actively growing
Dandelion*	Prior to bud
Field bindweed*	Late summer
Green smartweed**	Seedlings
Horsetail*	4 to 5 inches (10 to 13 cm)
Narrow-leaved hawk's-beard	Apply at rosette stage after alfalfa has gone dormant
Oak-leaved goosefoot	Up to 2 leaf stage
Perennial sow-thistle*	Rosette
Lady's-thumb**	Seedlings
Plantain	Prior to flowering
Wild buckwheat	Up to 2 leaf stage
Yellow rocket	Late September to mid-October

* Top growth control
** Suppression
Refer to individual product labels for details on application rates to use for different weed species.

Cost (2006 suggested retail prices):

Cobutox 600 - $21.70 per L †
Cobutox 625 - $22.80 per L
Embutox 625 - $22.60 per L
Caliber 400 - $14.38 per L†
Caliber 625 - $22.70 per L

† Prices on older formulations have not been established by the manufacturer since 2005 and actual retail price may differ from those listed here.

Rates:

When applying to seedling forage legumes and grasses:

HERBICIDE	RATE (L/ACRE)	ACRES TREATED PER CONTAINER
Cobutox 600	0.73 - 0.93	13.7 - 10.8
625 g ai/L formulations of 2,4-DB	0.71 - 0.91	14.1 - 11.0
Caliber 400	1.1 - 1.4	9.0 - 7.0

When applying to corn and to pastures containing forage legumes:

HERBICIDE	RATE (L/ACRE)	ACRES TREATED PER CONTAINER
Cobutox 600	0.73 - 1.13	13.7 - 8.8
625 g ai/L formulations of 2,4-DB	0.71 -1.11	14.1 - 9.0
Caliber 400	1.11 - 1.72	9.0 - 5.8

Application Information:

Water Volume: 61 to 81 L per acre.
Pressure: 30 to 40 psi (200 to 275 kPa).
Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Severe damage to legumes can occur if high temperatures (more than 27°C) or high humidity prevail at the time of application. Do not apply under dry soil/drought conditions.

Tank Mixes:

Herbicides:
Underseeded Legumes: All 625 g ai/L formulations of 2,4-DB (0.51 L/acre), Cobutox 600 (0.53 L/acre), or Caliber 400 (0.81 L/acre), plus MCPA amine (500 g/L) at 28 mL/acre. Embutox 625 (0.51 L/acre) plus MCPA sodium salt (300 g/L) at 47 mL/acre. This tank mix may increase crop damage (stunting). Follow all precautions and restrictions on both product labels.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on 2,4-DB labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 1 hour will reduce control.

Grazing:
Cobutox 600 - Do not graze or harvest treated seedling grasses in year of application.
Embutox 625, Cobutox 625 and Caliber 625 - Do not graze or cut treated crops or forage until 30 days after application.
Caliber 400 - Do not graze treated crops or cut for hay.

Recropping: No restrictions the year after application.

Aerial Application: Do not apply by air (Cobutox 625, Embutox 625 and Caliber 625). No restriction on other labels. Reduced water volumes used with aerial applications will lead to increased injury to forage legumes.

Storage: Do not freeze Caliber 400.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

 Danger Poison (Cobutox 600)

 Caution Poison (625 g ai/L 2,4-DB formulations)

 Warning Poison (Caliber 400)

Absolute

Herbicide Group – 2,4
(Refer to page 27)

This product is a prepackaged tank mix of Odyssey at 17 g/acre (page 163) and Lontrel† at 0.17 L/acre OR Lontrel Dry (Lontrel Dry is only available with Absolute) at 80 g/acre (page 153). Information listed is restricted to Crop, Weeds, Rates and Cost. For other detailed information on the effect of growing conditions, and restrictions for the component products see the product pages listed above.

Company:

BASF Canada

Formulation:

Odyssey (PCP#25111): 35% imazamox and 35% imazethapyr formulated as a dispersible granule.
Absolute may be prepackaged with either:

Lontrel (PCP#23545)†: 360 g/L clopyralid formulated as a solution.
Container size – 8 x 86.5 g water-soluble bags of Odyssey plus 2 x 3.4L jug of Lontrel (one case treats 40 acres).

OR

Lontrel Dry (PCP#27306): 75% clopyralid formulated as a dispersible granule.
Container size – 4 packs per case (800 g Lontrel Dry plus 2 X 86.5 g Odyssey per pack), (one case treats 40 acres).

† The liquid combination of Absolute is no longer produced, but supplies still remain in the retail system. This product may be removed from future editions of this guide.

Crops and Staging:

CLEARFIELD canola varieties from the 2 to 6 leaf stage. Apply **only** to CLEARFIELD canola varieties; application to any other variety of canola or any other crop will result in crop death.

Weeds and Staging:

Grasses:
Apply from 1 to 4 main stem leaves, until tillers are visible.

Barnyard grass	Volunteer cereals (wheat, barley, oats)
Green foxtail	
Persian darnel	Wild oats

Broadleaves:
Unless otherwise indicated, apply to broadleaf weeds up to 4-leaf stage.

Canada thistle (rosette to pre-bud stage)*	Shepherd's-purse
Chickweed	Smartweed
Cleavers (up to 4 whorls)	Stinkweed
Flixweed	Stork's-bill
Hemp-nettle	Volunteer canola (non-CLEARFIELD varieties)
Kochia**	
Lamb's-quarters**	Volunteer tame mustard
Redroot pigweed	Wild buckwheat
Russian thistle	Wild mustard

* top growth control for 6-8 weeks
** suppression

Cost (2006 suggested retail price):

$33.65 per acre

Rate:

Odyssey: 17.3 g / acre
Lontrel†: 0.17 L / acre or
Lontrel Dry: 80 g / acre.
Merge: 0.5 L per 100 L of spray solution

Absolute must be applied with Merge adjuvant (not supplied). Mix to a final ratio of 0.5 L of Merge in 100 L of spray solution (0.5% Merge volume to spray solution volume). At a spray volume of 40 L / acre one 8.1 L jug of Merge will treat 40 acres.

One case treats 40 acres.

Do not apply more than once per year.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan nozzles calibrated for 20-40 psi. Use a 50 mesh or coarser screen and filter system.

See component products for additional information including restrictions.

Accent*

Herbicide Group – 2
(Refer to page 27)

Company:

E. I. duPont Canada (PCP#25116)

Formulation:

75% nicosulfuron formulated as a water dispersible granule.

Container size - 133.6 g (4 x 33.4 g water soluble bags).

Crops and Staging:*

Field Corn - 1 to 8 leaf stage (six visible collars), coleoptile (short, blunt leaf) is counted as the first leaf.

Sweet corn (Krispy King, Jubilee and Jubilee Supersweet varieties only) – 1 to 6 leaf stage (4 visible collars).

** NOTE - Since applications to field and sweet corn in western Canada has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance.* ***Application to corn is at the risk of the user.***

Weeds and Staging:

WEEDS	STAGING
Barnyard grass, fall panicum, green foxtail, yellow foxtail*, old witchgrass	1-6 leaves (up to 2 tillers)
Quackgrass	3-6 leaves (with extended leaf 4-8 inches (10 to 20 cm) long)
Wild oats	3-6 leaves

* suppression only

The best control and yield response is achieved by applying at the earlier end of the leaf stage ranges.

Cost (2006 suggested retail price):

$25.05 per acre.

Rates:

Apply Accent at 13.5 g/acre. Add non-ionic surfactant (Citowett Plus, Agsurf or Agral 90) at 0.2 L per 100 L of spray solution.

One bag of Accent will treat 2.5 acres (1 ha).

One container will treat 10 acres (4 ha).

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: Minimum 40 L per acre; optimum 56 to 77 L per acre.

Pressure: 25 to 40 psi (175 to 275 kPa).

Nozzles: Flat fan nozzles tilted forward at a 45° angle. Screens of 50 mesh or larger are recommended.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Poor weed control or crop injury may result if at the time of application, plants are under stress from disease, insect or nematode injury, carryover of herbicide from a previous years application, abnormally hot or cold weather, drought, water-soaked soils, hail damage or frost. Delay application until stress passes and both corn and weeds have resumed growth. When corn is injured by frost, wait 48 to 72 hours after normal growing conditions have resumed before applying Accent. Stress conditions after application may also result in injury or poor weed control.

Tank Mixes:

Herbicides:
Field corn only:
Banvel II (0.24 L/acre) plus surfactant.
Pardner (0.4 L/acre) plus surfactant.

Fertilizers: Do not mix with fertilizers.

Insecticides: None registered. *Accent should not be applied to corn that has been treated with Counter, Cygard, Thimet, or Di-Syston. Leave 7 days between the application of Accent and that of a foliar organophosphorous insecticide.*

Fungicides: None registered.

Note: The above mixes are those listed on the Accent label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Restrictions:

Rainfall: Within 2 to 4 hours of application may result in reduced weed control.

Grazing: Do not graze treated crops or cut for hay.

Preharvest: Leave at least 30 days in field corn and 40 days in sweet corn from application to harvest.

Recropping: Corn, canola, navy beans, soybeans, red clover, alfalfa, sorghum, and spring cereals may be seeded the year following Accent application. For all other crops, a field bioassay is recommended before planting.

Aerial Application: Do not apply by air.

Storage: Store product in original containers in a secure, dry area, away from other pesticides, food or feed.

Environment: Leave a 5 m buffer between the last spray path and woodlots or shelterbelts. Leave a 22 m buffer before wetland areas or water bodies.

Tank Cleaning:

Drain tank and hose down interior surfaces. Flush tank, hoses, boom, and nozzles with clean water for a minimum of 5 minutes. Fill spray tank with a water-ammonia cleaning solution (1 litre of a minimum 3% household ammonia for every 100 L of water). Flush hoses, boom and nozzles with the cleaning solution, then add more water to completely fill the tank. Circulate for 15 minutes, then flush hoses, boom and nozzles with the cleaning solution, and drain the tank. Remove and clean the nozzles and screens separately in a bucket containing the cleaning solution as above. If the spray equipment is to be used to spray crops other than corn, repeat the above process and thoroughly wash the spray mixture from the outside of the spray tank and the boom. Thoroughly rinse the tank with clean water for a minimum of 5 minutes, flushing the water through the hoses and boom. Prior to using the sprayer again, flush the tank, boom and hoses for 5 minutes with fresh water. Do not clean equipment where cleaning solution could flow towards water bodies, ditches, cropland, shelterbelts, or areas where people are likely to frequent or walk.

For additional information, refer to page 14.

Hazard Rating:

KEEP OUT OF REACH OF CHILDREN.
Caution Eye Irritant
Avoid breathing spray mist.
Avoid contact with skin, eyes and clothing.

Achieve Liquid

Herbicide Group – 1
(Refer to page 27)

Company:

Dow AgroSciences (PCP#27011)

Formulation:

Achieve Liquid: 400 g / L tralkoxydim formulated as a suspension concentrate.
Container size – 8 L plus 2x10 L of Turbocharge adjuvant.

Crops and Staging:

No staging restrictions unless otherwise indicated.

Spring wheat (including durum), winter wheat, barley, triticale, rye (spring and fall), seedling perennial cereal rye* (1 to 4 leaf stage).

May be used on wheat and barley crops undersown to the following forage legumes (if not tank mixed with a broadleaf herbicide):

Alfalfa	Clovers
Bird's-foot trefoil	Sanfoin

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Seedling and established forages*:
Apply prior to tillering of weeds including: creeping red fescue, crested wheatgrass, intermediate wheatgrass, meadow bromegrass and smooth bromegrass either underseeded to a cereal or grown alone.

For the establishment of forages grasses*:
Apply prior to tillering of weeds including: northern wheatgrass, slender wheat grass and western wheatgrass.

** NOTE -Since applications to these crops have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance.* ***Applications to these crops is at the risk of the user***

Weeds and Staging:

Wild oats - 1 to 6 leaf stage (total leaves including tillers), with a maximum of 2 tillers.

Volunteer tame oats - 1 to 6 leaf stage.

Green and yellow foxtail - 1 to 5 leaf stage (total leaves including tillers), with a maximum of 1 tiller.

Barnyard grass, Persian darnel - 1 to 4 leaf stage (total leaves including tillers).

Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before tillering.

Cost (2006 suggested retail price):

$18.09 per acre.

Rates:

0.2 L per acre. One case treats 40 acres. Add Turbocharge at a rate of 0.5 L per 100 L spray solution.

If water analysis shows bicarbonate levels are 400 ppm or greater, add ammonium sulfate at 0.75 to 1.5 kg per 100 L of spray water prior to mixing.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume:
Ground: 20 to 40 L per acre. Application in less than 20 L per acre water volume may result in mixing problems or unacceptable crop injury.
Aerial: 12 to 18 L / acre.

Pressure:
Ground: 40 psi (275 kPa).
Aerial: 20 to 40 psi (140 to 275 kPa)

Nozzles: 80° or 110° flat fan nozzles. All strainer and nozzle screens must be 50 mesh or coarser.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Cereal crops that have set tillers may incur injury (yellowing and / or stunting) if applications are made within 48 hours of freezing temperatures. Cereal crops that have not set tillers may be injured if exposed to temperatures of 4°C or less up to 48 hours before or after application. Tank mixing with a broadleaf weed herbicide under adverse conditions may increase severity of crop injury. Crops under stress from foliar diseases or low fertility are more susceptible to injury from application. Temporary crop injury may occur when Achieve tank mixes (particularly Estaprop, Turboprop, Dichlorprop D, and Buctril M + MCPA) are applied under extreme environmental conditions (dry or wet, cool or hot weather) resulting in crop stress. Control of grasses could be reduced when they are stressed due to drought, heat, lack of fertility, flooding or prolonged cool temperatures.

Tank Mixes:

For all tank mixes with Achieve, add Turbocharge at a rate of 0.5 L per 100 L of spray solution.

Herbicides:
Do NOT tank mix Achieve products with a broadleaf herbicide when applying to underseeded forage grasses or legumes.

	CROPS						
Tank mix Partner	**Spring wheat**	**Durum**	**Winter wheat**	**Barley**	**Spring rye**	**Fall rye**	**Triticale**
2,4-D ester (0.38 L / acre)†	✓	✓	✓	✓	✓	✓	
Attain (40 acres per case)**	✓			✓			
Buctril M (0.4 L / acre)*	✓	✓	✓	✓		✓	
Curtail M (0.81 L / acre)	✓	✓		✓			
Dichlorprop + 2,4-D (0.71 L / acre)*	✓	✓	✓	✓			
Lontrel (0.11 L / acre) + MCPA ester (0.45 L / acre)	✓	✓		✓			
MCPA ester (0.45 L / acre)	✓	✓	✓	✓	✓	✓	
Mextrol 450M (0.51 L / acre)*	✓	✓		✓			
Pardner (0.40 L / acre)*	✓	✓	✓	✓		✓	✓
Prestige (20 acres per case)**	✓	✓		✓			
Thumper (0.40 L / acre)*	✓	✓		✓			
Trophy (20 acres / case)	✓	✓		✓			

† 600 g / L formulations
* Tank mixes may result in some temporary initial injury under adverse environmental conditions
** Temporary crop injury can occur if applied prior to the 4 leaf stage. A reduction in wild oat control may occur with this mix.

Do NOT tank mix Achieve with herbicides or formulations of herbicides not listed above as loss of grass control may result. When applying broadleaf herbicides not listed above, in the same field, always apply Achieve first. Apply the broadleaf product no sooner than seven days after application of Achieve.

Fertilizers: None registered.

Insecticides: Decis Flowable at 49 mL per acre. Matador at 25 - 34 mL / acre. These mixes may also be combined with Buctril M or Pardner.

Fungicides: None registered.

Note: The above mixes are those listed on the Achieve label only. To check for other possible mixes see the blue chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 1 hour will reduce control.

Grazing: Straw from treated crops may be fed to livestock. Immature cereal crops may be grazed or cut for hay 16 days after treatment. Do not feed or graze underseeded forage crops in year of treatment

Preharvest: Leave at least 60 days from application to harvest.

Recropping: Do NOT replant treated areas to tame oats or corn for at least 4 weeks after application.

Aerial Application: Achieve may be applied by air in 14 to 18 L / acre. Do not apply within 50 m of fish bearing waters and wildlife habitat.

Storage: Store in a dry place. Do not freeze.

Environment: Do not apply within 15 m by ground (50 m by air) of fish bearing waters, wetlands and wildlife habitat.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Skin and Eye Irritant

Achieve Liquid Gold

Herbicide Group – 1,4,6
(Refer to page 27)

This product is a prepackaged tank mix of Achieve (page 55) and Buctril M (page 84). Information listed is restricted to Crop, Weeds, Rates and Cost. For other detailed information on the component products see the product pages listed above.

Company:

Dow AgroSciences

Formulation:

Achieve Liquid Gold contains 3 components:

Achieve Liquid (PCP#27011): 400 g/L tralkoxydim formulated as a suspension concentrate. Container size – 4 L

Buctril M (PCP#18022): 280 g/L bromoxynil and 280 g/L MCPA ester formulated as an emulsifiable concentrate. Container size - 8 L.

Turbocharge adjuvant (PCP#23135). Container size - 4 L.

Crops and Staging:

Spring wheat (including durum), barley - 2 leaf to early flag leaf stage.

Winter wheat, fall rye - from the time growth commences in the spring to the early flag leaf stage.

Weeds and Staging:

Grassy weeds :

Wild oats - 1 to 6 total leaves to a maximum of 2 tillers.

Barnyard grass, Persian darnel - 1 to 4 total leaves including tillers.

Green & yellow foxtail - 1 to 5 total leaves, maximum of 1 tiller.

Volunteer tame oats - 1 to 6 leaf stage.

Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are controlled before tillering.

Broadleaf weeds:

Up to the 4 leaf stage:

American nightshade
Ball mustard
Bluebur
Cocklebur
Cow cockle
Flixweed
Green smartweed
Kochia*
Lady's-thumb
Night-flowering catchfly
Pale smartweed
Redroot pigweed
Russian thistle*
Scentless chamomile (spring annuals only)
Shepherd's-purse
Velvetleaf**
Volunteer canola
Volunteer sunflower

Up to the 6 leaf stage:

Wild tomato

Up to the 8 leaf stage:

Common groundsel
Common ragweed
Lamb's-quarters
Stinkweed
Tartary buckwheat
Volunteer tame buckwheat
Wild buckwheat
Wild mustard
Wormseed mustard

Perennials (top growth control):

Canada thistle
Perennial sow-thistle

* Spray before plants are 2 inches (5 cm) in height.
** Spray before plants are 3 inches (8 cm) in height.

Cost (2006 suggested retail price):

$24.08 per acre.

Rates:

One case treats 20 acres. Add Turbocharge at a rate of 0.5 L per 100 L spray solution.

If water analysis shows bicarbonate levels are 400 ppm or greater, add ammonium sulfate at 0.75 to 1.5 kg per 100 L water.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 20 to 40 L per acre. Do not apply with air assist sprayers set to apply less than 20 L per acre water volume as mixing problems or unacceptable crop injury could occur.

Pressure: 40 psi (275 kPa).

Nozzles: 80° or 110° degree flat fan nozzles. All strainer and nozzles screens must be 50 mesh or coarser.

Tank Mixes:

Herbicides: MCPA ester (0.22 L/acre) (500 g/L formulations). A reduction in green foxtail control may occur with this tank mix.

Insecticides: Decis Flowable (49 mL/acre). Matador (25 - 34 mL/acre).

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Adrenalin SC

Herbicide Group – 2,4
(Refer to page 27)

Company:

BASF Canada

Formulations:

Adrenalin SC (PCP#27879): 20 g/L imazamox and 560 g/L 2,4-D ester formulated as a suspension concentrate. Container size 2 X 8L.

Crops and Staging:

Adrenalin SC: CLEARFIELD wheat varieties – 4 leaf to 6 leaf stage.

Apply only to CLEARFIELD wheat varieties; application to any other variety of wheat or any other crop will result in crop death.

Weeds and Staging:

Grasses:
Apply from 1 to 4 main stem leaves, up to a maximum of two tillers.

Barnyard grass
Green foxtail
Persian darnel
Volunteer barley
Volunteer wheat (non-Clearfield)
Wild oat
Yellow foxtail

Broadleaves:
The following weeds will be controlled up to the 4-leaf stage under a wide variety of conditions. Application at an earlier weed stage provides the best yield response.

Annual smartweed species (including lady's thumb)
Annual sow-thistle
Bluebur
Cocklebur
Cow cockle
Daisy fleabane
False flax
Flixweed
Goat's-beard
Kochia
Lamb's-quarters
Mustards (except dog and tansy)
Narrow-leaved hawk's-beard
Plantain
Prickly lettuce
Ragweeds
Redroot pigweed
Russian pigweed
Russian thistle
Shepherd's purse
Stinging nettle
Stinkweed
Sweet clover
Thyme-leaved spurge
Volunteer canola (all varieties)
Wild buckwheat
Wild mustard
Wild radish
Wild sunflower

The following weeds are suppressed up to the four leaf stage with Adrenalin SC when conditions are optimal for growth. Control may be reduced if weeds are found in high population densities, or are growing under stressful conditions (drought, cold, heat).

Biennial wormwood✧
Blue lettuce✧
Chickweed, common
Cleavers
Curled dock✧
Dandelion✧
Groundsel, common
Gumweed✧
Hawkweed
Heal-all
Hedge bindweed✧
Hemp-nettle
Horsetail
Knotweed
Leafy spurge✧
Mustards (dog and tansy)
Oak-leaved goosefoot
Peppergrass, common
Pigweed, prostrate
Pigweed, tumble
Pineappleweed
Purslane
Russian knapweed✧
Sheep sorrel✧
Yellow rocket

✧Only seedlings of biennial and perennial weeds will be controlled. Established plants emerging from roots will not be controlled.

Adrenalin SC will give top growth control of the following weeds. Control may be reduced if weeds are found in high population densities, or are growing under stressful conditions (drought, cold, heat).

Bull thistle
Burdock
Buttercup
Canada thistle
Field bindweed
Hoary cress
Perennial sow-thistle
Tartary buckwheat

Cost (2006 suggested retail price):

$19.49 per acre.

Rate:

Adenalin SC: 0.4 L per acre (One case treats 40 acres). Adrenalin SC requires the addition of a non-ionic surfactant including (Agral 90 Ag-Surf or Surf 92) at 0.25 L per 100L of spray solution. Surfactant not included with Adrenalin SC.

Use of an anti-foam agent is suggested.

Do not apply more than once per year.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: No nozzle preference is indicated. Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Initial crop injury may be observed after application but this is outgrown and should not affect yield. Severe crop injury will occur as a result of spray overlap. AVOID SPRAYER OVERLAP.

Do not spray if freezing or near freezing (+2 Celsius or lower) temperatures are forecast. Treat CLEARFIELD wheat during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced. Application must be made before the crop canopy shields the weeds.

Tank Mixes:

None registered.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: DO NOT graze the treated crop within 14 days of application or cut for hay within 42 days of application.

Preharvest Interval: Do not apply within 79 days of harvest.

Recropping: The following crops may be grown safely the year following an application: Canaryseed, canola (all varieties), field peas, flax, lentils, spring wheat, durum, barley, oats.

Conduct a field bioassay the year before growing any other crop than those listed above.

Aerial Application: Do not apply by air.

Storage: Do not freeze. Store in a cool, dry place above 5°C.

Environment:
These products are highly toxic to non-target plants. Avoid overspraying and applying in situations when drift may occur. Leave a buffer zone of 11 metres between the downwind edge of the spray boom and sensitive areas. Areas to be buffered include shelter belts, hedgerows, wetlands, woodlots, vegetated ditch-banks, ponds, streams, potholes, sloughs, and other cover on the edges of fields. This product contains petroleum distillate which is toxic to aquatic organisms. Avoid contamination of aquatic systems during application and cleaning operations.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Keep Out of Reach of Children

Ally Toss-N-Go

Herbicide Group – 2
(Refer to page 27)

Company:

E. I. duPont Canada Inc. (PCP#24388)

Formulation:

60% metsulfuron methyl formulated as a dry flowable.
Container size - 122 g package (4 x 30.5 g water soluble bags).

Crops, Rates and Staging:

Cereals – up to 3 g/acre:
Wheat (spring and durum), barley - 2 leaf to emergence of the flag leaf.

Established forage grasses for forage or seed production* - up to 3 g/acre:
Apply from the 2 leaf to flag leaf stage and before canopy is dense enough to prevent thorough leaf coverage.

Crested wheatgrass	Creeping red fescue
Intermediate wheatgrass	Orchard grass

Pasture and Rangeland – Up to 12 g/acre

* NOTE - Since applications to forage grasses have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to forage grasses is at the risk of the user.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Cereals and forage grasses:

Unless otherwise indicated, apply to weeds at the 2 to 4 leaf stage.

Alone or in tank mix with a grass control herbicide use 3 g/acre. Use 2 to 3 g/acre (One 122 g package treats 40 to 60 acres) of Ally when tank mixing with 2,4-D or MCPA. Add non-ionic surfactant such as Agral 90, Agsurf, Companion, Super Spreader or Citowett Plus at 0.2 L per 100 L spray volume.

Weeds Controlled:

Ball mustard	Lady's-thumb
Bluebur	Prostrate pigweed
Chickweed	Redroot pigweed
Common groundsel	Scentless chamomile
Corn spurry	Shepherd's-purse
Cow cockle	Stinkweed
Flixweed	Stork's-bill
Green smartweed	Tartary buckwheat
Hemp-nettle	Volunteer canola*
Kochia	Wild mustard

* CLEARFIELD varieties will be controlled only with the addition of 2,4-D or MCPA.

Weeds Suppressed:

Canada thistle**	Sow-thistle (annual and perennial)
Lamb's-quarters	
Russian thistle	Toadflax
Wild buckwheat***	

** Apply when thistles are less than 6 inches (15 cm) tall.
*** Apply to wild buckwheat up to the 3 leaf stage.

Pastures and Rangelands:
Western snowberry - 10 g/acre
Wild rose - 12 g/acre

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$4.10 to $6.15 per acre.

Application Information:

Water Volume:
Cereals and forage grasses: Minimum 40 L per acre.
Pastures and Rangelands: 40 to 91 L per acre.

Pressure: No application pressures are recommended by the manufacturer. Typical application pressures for standard flat fan nozzles are from 35 to 40 psi (240 to 275 kPa).

Nozzles: Flat fan nozzles. Use 50-mesh screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Ally may injure crops stressed by heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures, drought, or water-saturated soils, either before or after application. Weed control will be reduced under dry, cold conditions.

Tank Mixes:

Do not mix the soluble bags with any substance containing boron or which releases chlorine.

Herbicides:

In wheat and barley:
2,4-D Amine or Ester (up to maximum rate for susceptible weeds on 2,4-D page), plus surfactant.
Avenge (1.72 L / acre), no surfactant required.
Avenge + MCPA Ester, no surfactant required.
MCPA Amine or Ester (0.28 to 0.45 L / acre of 500 g / L formulation), plus surfactant.

In spring wheat (including durum):
Horizon (95 or 115 mL / acre) plus Score adjuvant
Puma^{120} Super (0.15 to 0.31 L / acre), no surfactant required.

In creeping red fescue:
Assure II (0.2 to 0.3 L / acre) plus Sure-Mix adjuvant.

Consult tank mix partner labels for additional crop staging and variety restrictions.

Fertilizer: None registered. Do not mix the soluble bags with fertilizers.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Ally label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rain within 4 hours of application of tank mixes with 2,4-D amine, 2 hours of application of tank mixes with 2,4-D ester, will reduce weed control.

Grazing: No restrictions.

Recropping: Refer to table below. The following recropping intervals, based on soil pH, should be considered as guidelines only. Ally residues may affect crops for a longer period of time than outlined in the following table. Add 12 months to recommendations if less than 5 inches (130 mm) of rainfall in brown and dark brown soils or less than 10 inches (250 mm) rainfall in black or grey wooded soils in any year following application.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. May be frozen.

Caution:

Ally residues can persist for long periods, potentially limiting recropping options. Degradation of Ally is dependent on the pH, moisture, and temperature of the soil. Refer to the label for details on rotation and minimum recropping intervals.

MINIMUM RECROPPING INTERVAL (MONTHS)

SOIL PH	BARLEY, WHEAT	OAT*	CANOLA*	FLAX*	LENTILS	CANARY-SEED	YELLOW MUSTARD
less than 7.0	10	10	10 (22)	10 (22)	34	48	48
7.0 -7.9	10	10 (22)	22 (34)	34	48	48	48

* Figures in brackets refer to recropping intervals in brown and dark brown soil zones.

ALL OTHER DATA refer to recropping intervals in all soil zones. On black and grey wooded soils with pH of 7.5 or less, fescue may be planted 10 months after application and alfalfa, red clover, peas and flax may be planted 22 months after application. Do not use on soils with pH greater than 7.9.

Effects of Ally residues on crops other than those listed in the table have not been fully evaluated. Because of the length of recropping restrictions and the lack of information on many rotational crops, Ally is not recommended for use on farms where special crops are grown (such as fababeans, beans, sunflowers, buckwheat, corn, potatoes, sugar beets, etc.).

Tank Cleaning:

Ally can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Ally should be flushed out immediately after Ally is used. The manufacturer recommends that sprayers used to apply this product be flushed 2 times with a water / household ammonia rinse (1 L of 3% ammonia per 100 L water). All nozzles, screens and filters should be removed and cleaned after applying this product.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

For additional information refer to page 14.

Hazard Rating:

Caution Poison

Caution Eye Irritant

Altitude FX

Herbicide Group – 2,4
(Refer to page 27)

Company:

BASF Canada

Formulations:

Altitude FX contains 3 separate components. Each case contains:

AC 299,263 120 AS (PCP#26705): 120 g/L imazamox formulated as a solution – 1.34 L

Starane (PCP#24815): 180 g/L of fluroxypyr formulated as an emusifiable concentrate – 4.8 L.

MCPA ester 600 (PCP#27802): 600 g/L of MCPA ester formulated as an emusifiable concentrate – 7.5 L.

Crops and Staging:

CLEARFIELD wheat varieties – 3 leaf to 6 leaf stage.

Apply only to CLEARFIELD wheat varieties; application to any other variety of wheat or any other crop will result in crop death.

Weeds and Staging:

Grasses:
Apply from 1 to 4 leaves, up to a maximum of two tillers.
Green foxtail, Persian darnel, volunteer cereals (barley, oat, non-Clearfield spring wheat, durum wheat), wild oat, yellow foxtail.

Broadleaves:
Apply up to 4 leave stage unless otherwise indicated.

Annual sunflower
Burdock common
Chickweed
Cleavers (1-4 whorls)
Cocklebur
Common ragweed
Cow cockle
Flixweed
Green smartweed*
Hemp nettle (2-6 leaf)
Kochia (including group 2 resistant biotypes)
Lamb's-quarters
Mustards (except dog and tansy)
Prickly lettuce
Redroot pigweed
Shepherd's purse
Stinkweed
Stork's bill (1-8 leaf)
Vetch
Volunteer canola (all varieties)
Volunteer flax (1-12 cm)
Wild buckwheat
Wild radish

* supression

Cost (2006 suggested retail price):

N/A

Rates:

AC 299,263 120 AS: 67 mLs/acre.
Starane: 0. 24 L/acre.

MCPA 600 Ester: 0.38 L/acre.

Altitude FX requires the addition of a non-ionic surfactant including (Agral 90 Ag-Surf or Surf 92) at 0.25 L per 100L of spray solution. Surfactant not included with Altitude FX.

Do not apply more than once per year.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: No nozzle preference is indicated. Use a 50 mesh or coarser screen and filter system.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Initial crop injury may be observed after application but this is outgrown and should not affect yield. Severe crop injury will occur as a result of spray overlap. AVOID SPRAYER OVERLAP.

Do not spray if freezing or near freezing temperatures are forecast within 3 days of applicaton. Treat CLEARFIELD wheat during warm weather when weeds are actively growing and soil moisture is adequate for rapid growth. Under cool or dry conditions, control of some weeds may be severely reduced. Application must be made before the crop canopy shields the weeds.

Tank Mixes:

None registered.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: DO NOT graze the treated crop within 14 days of application or cut for hay within 42 days of application.

Preharvest Interval: Do not apply within 79 days of harvest.

Recropping: The following crops may be grown safely the year following an application: Canola (all varieties), field peas, flax, lentils, spring wheat, barley, oats.
Conduct a field bioassay the year before growing any other crop than those listed above.

Aerial Application: Do not apply by air.

Storage: Do not freeze. Store in a cool, dry place above 5°C. Combustible – do not store near heat or open flame.

Environment:

These products are highly toxic to non-target plants. Avoid over spraying and applying in situations when drift may occur. Leave a buffer zone of 15 metres between sprayed and sensitive areas. Areas to be buffered include shelter belts, hedgerows, wetlands, woodlots, vegetated ditchbanks, ponds, streams, potholes, sloughs, and other cover on the edges of fields. This product contains petroleum distillate which is toxic to aquatic organisms. Avoid contamination of aquatic systems during application and cleaning operations.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Keep Out of Reach of Children


Danger Poison - Starane


Warning Poison – MCPA ester

Warning Eye Irritant – Starane

Caution Skin Irritant - Starane

Amitrol 240

Herbicide Group – 11
(Refer to page 27)

Company:

Nufarm Agriculture (PCP#25684)

Formulation:

231 g/L amitrole formulated as a liquid.
Container size - 10 L.

Crops, Rates and Staging:

Fall Stubble: Perennial weed control prior to spring seeding. No planting restrictions for barley, canola*, field corn, field pea, soybean, wheat, or white bean, but leave 8 months between application and the seeding of any other crops.

Alfalfa stand renovation/removal: 4 to 6 inches (10 to 15 cm) high.

Pastures (spot treatment only): For non-selective patch treatment of dandelion, Canada thistle, perennial sowthistle, hoary cress, milkweed, poison ivy and toadflax apply 0.165 L in 25 L of water to treat a 10 m x 10 m area. For treatment of leafy spurge and horsetail, apply 0.460 L in 25 L of water to treat a 10 m x 10 m area. Do not mow treated plants for 3 weeks after application.

Established shelterbelts: up to 11.3 L per acre - Keep spray away from tree foliage or trunks.

Pre-seeding:

CROP	RATE (L/ACRE)	Delay seeding after application
Barley, wheat, canola*	1.7	0 to 1 days
Field pea	1.7	5 to 7 days
Soybean (low rate)	1.7	6 days
Field corn, white bean, soybean (high rate)	3.3 to 6.7	10 to 14 days

* The Canola Council of Canada recommends that Amitrol 240 not be used prior to canola grown for export markets.

Avoid using rates higher than 6.7 L per acre for preplant applications on very light textured soils with low organic matter, as crop damage can occur.

Fallow areas: Apply according to weed stage and rates below.

Weeds, Rates and Staging:

Fall stubble: Canada thistle, perennial sow-thistle - Spray when thistle has 4 to 6 inches (10 to 15 cm) of new growth. Do not cultivate for 2 weeks after application. Do not apply after October 1. Do not replant crops in treated areas within 8 months of application except those registered for pre-seeding uses.

Pre-seeding: Dandelion and annual weeds Apply 1.7 L per acre to actively growing weeds less than 10 cm tall or across. Do not cultivate for 10 to 14 days after treatment.

Fallow, Pastures and Shelterbelts:

WEED	RATE (L/ACRE)	WEED STAGE
Canada thistle	5.0 to 6.7	Early bud to bloom stage.
Cattails	15.2 to 18.5	After seed heads have formed.
Dandelion	1.7 to 5.0	Young and actively growing plants.
Hoary cress	7.6 to 11.3	Advanced rosette and bud stage.
Horsetail	5.0 to 6.7	Actively growing plants.
Leafy spurge	15.2 to 18.5	Advanced flowering to early seed set
Milkweed	7.6 to 11.3	Early summer after majority of shoot emergence.
Perennial sow-thistle	5.0 to 6.7	Early bud to bloom stage.
Poison ivy	3.7	Fully developed green foliage.
Toadflax	7.6 to 11.3	Advanced rosette to prebud.

Cost (2006 suggested retail price):

$6.90 per L.

Application Information:

Water Volume:
Fall stubble: 20 to 81 L per acre.
Pastures, shelterbelts: 40 to 121 L per acre. For poison ivy, apply 202 to 405 L per acre.
Pre-seeding: 20 to 81 L per acre.

Pressure: 45 psi (Less than 300 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Less than acceptable results may occur in dry weather.

Tank Mixes:

Herbicides: Mix 1.68 L per acre Amitrol 240 with 0.5 L per acre Roundup for improved control of certain weeds, including dandelion. Follow directions on the Amitrol 240 and Roundup labels for timing and use precautions.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze treated crops or weeds or use for hay or feed.

Recropping: Do not plant any crop for 8 months following application except those registered for pre-seeding uses.

Aerial Application: Do not apply by air.

Storage: Do not store where temperatures may exceed 50°C or near open flames. Do not store below 4°C.

Environment: Do not contaminate any body of water. Use cautions to prevent spray, spray mist, or vapours from drifting off target. Spray drift may cause damage to crops or vegetation.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Caution eye irritant

Avoid breathing spray mist or vapours.

Do not re-enter treated areas within 12 hours.

Assert 300 SC

Herbicide Group – 2
(Refer to page 27)

Company:

Nufarm Agriculture (PCP# 21032)

Formulation:

Assert: 300 g/L imazamethabenz formulated as a suspension concentrate. Container size - 2 x 10.8 L jugs per case.

pH adjuster: 94.5% sodium bisulfate formulated as a soluble granule. Container size - 2 x 2.5 kg bags (1 bag per 10.8 L jug of Assert).

Crops, Rates and Staging:

pH adjuster: 1 packet per jug of Assert to be used.

Assert up to 0.67 L/acre (16.1 acres per jug):
Barley, spring wheat (including durum) - 1 to 6 leaf stage.
Annual ryegrass (seed production only) – 4 to 6 leaf stage.

Assert at 0.34 L/acre (32 acres per 10.8 L jug):
Sunflower – plants (not under drought stress) that are in the 2 to 8 leaf stage. Crop must be less than 15 inches (38 cm) tall except for semi-dwarf varieties, which must be less than 12 inches (30 cm), and dwarf varieties, which must be less than 4 inches (10 cm). Stunting and head deformation can occur from applications made beyond recommended stages.

Do not apply Assert to the same field more than once in two years.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions. Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Weeds, Rates and Staging:

Assert at 0.34 L/acre rate:
Stinkweed and wild mustard - up to 6 leaves.

Assert at 0.54 L/acre (20 acres per 10.8 L) – weeds above plus:
Wild and tartary buckwheat (suppression) – up to 4 leaves.
Wild oats – majority from 1 to 3 leaves.

Assert at 0.67 L/acre rate (16 acres per 10.8 L) – weeds above plus:
Wild oats - 1 to 4 primary leaves.

Cost (2006 suggested retail price):

Cereals and Annual ryegrass -$13.62 to $17.03 per acre
Sunflower -$8.58 per acre (wild mustard only).

Application Information:

Water Volume: In cereals only, Assert may be applied in 20 to 40 L of water per acre when applied alone or when tank mixed with dichloroprop+2,4-D, 2,4-D ester, or MCPA ester. For all other applications, apply in 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not apply Assert 24 hours before or after a frost. It works best at warm temperatures. Performs relatively consistently under dry conditions. If cold, wet soil conditions persist in the days after application, retillering of wild oats may occur. Do not apply to drought stressed sunflowers.

Tank Mixes:

Herbicides:

Assert may be applied at either 0.53 L or 0.67 L per acre in tank mixes in the brown and dark brown soils, but must be applied at 0.67 L per acre when tank mixing in the black and grey wooded soils for adequate wild oat control.

In spring wheat (including durum) and barley:
2,4-D Ester* (up to 0.32 L/acre) (700 g/L formulations)
Curtail M (0.80 L/acre)
Dichlorprop + 2,4-D (0.7 L/acre) (Estaprop & Turboprop 600 only)*
Express Pack*** (40 acres per case)
Frontline (40 acres per case)
MCPA Ester* (up to 0.45 L/acre) (500 g/L formulations)
Puma^{120} Super** (0.118 L/acre)
Puma^{120} Super** + MCPA Ester, or Refine Extra (rates listed)
Refine Extra*** (8 g/acre)
Refine Extra*** (8 g/acre) + MCPA Ester (0.28 to 0.45 L/acre) (500 g/L formulations)
Spectrum (20 acres per case)
Unity*** (40 acres per case)

In spring wheat (NOT including durum) and barley:
Attain (40 acres per case)
Prestige (20 acres per case)

In spring wheat and durum wheat only:
Dichlorprop + 2,4-D (0.7 L / acre) (Turboprop 600 only)

* Apply in 20 to 40 L of water per acre. For all other tank mixes use 40 L / acre.

** Use the 0.54 L / acre rate of Assert when tank mixing with Puma[120] Super.

*** When tank mixing dry broadleaf products, add products to the tank in the following order: dry broadleaf products, acidifier, Assert, and other liquid herbicides if required. For repeat tanks, dry broadleaf products need to be mixed with water to form a slurry prior to adding to the remaining spray solution in the tank.

Refer to Assert label for specific mixing order and application details when tank-mixing. Refer to tank mix partner for additional crop staging restrictions. Tank mixes containing Refine Extra must be used within 12 hours or product degradation may occur.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Assert label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours will reduce control.

Grazing: Do not graze treated fields or cut treated forage for silage or hay. Mature barley and wheat grain or straw from fields treated with Assert can be fed to livestock. Do not feed or graze treated annual ryegrass.

Preharvest Interval: Do not apply beyond the recommended crop stage.

Recropping:

Do not apply Assert to the same field more than once in two years.

Year After Application	Black and Grey Wooded Soils	Brown and Dark Brown Soils
Year 1	Spring wheat (including durum), barley, canola, field peas, flax, sunflowers	Spring wheat (including durum), CLEARFIELD canola, barley, sunflowers
Year 2	Spring wheat (including durum), barley, canaryseed, canola, field peas, flax, oats, sunflowers	

Conduct a field bioassay (a test strip grown to maturity) the year before growing any crop not listed in the table. Lentils are known to be particularly sensitive to Assert residues in the soil. The additive effect of soil residues from the use of Assert and sequential applications of Ally or Unity (not for use in Manitoba) herbicides on the same land area has not been determined. Crop rotation guidelines are not known and injury to rotational crops other than wheat (excluding durum) may occur. Plant only wheat (excluding durum) on fields where these herbicides have been used until a field bioassay demonstrates other crops can be grown successfully.

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environment: Leave a distance of 15 m between the outside boundary of the sprayed area and bodies of water (lakes, ponds, sloughs, streams, rivers, etc.).

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Assure II

Herbicide Group – 1
(Refer to page 27)

Company:

E. I. duPont Canada (PCP#25462)

Formulation:

96 g/L quizalofop-P-ethyl formulated as an emulsifiable concentrate. Container size – 8 L.

Sure-mix adjuvant. Container size – 8 L.

Crops and Staging:

No leaf stage restrictions, but do not apply beyond preharvest intervals listed in the table:

CROP	PREHARVEST INTERVAL (DAYS)
Canola	64
Chickpea	85
Dry Edible Beans*†	30
Flax, or Solin (low linolenic acid flax)	82
Soybeans	80
Lentils	65
Peas (field and processing)	65

† NOTE: While Assure II has been authorized for use on all dry field bean types (except faba beans) not all types have been tested for tolerance. When using Assure II on a new dry bean type or variety for the first time evaluate tolerance on a small area first before applying large acreages and check with seed supplier for varietal sensitivity.

Forage Crops (no preharvest interval restrictions): alfalfa (seed production), and seedling bird's-foot trefoil, sainfoin, clovers (white, red, alsike and sweet) for seed production* and creeping red fescue for seed*.

* NOTE - Since applications to these crops have been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to these crops is at the risk of the user.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Costs (2006 suggested retail price):

$12.22 to $25.38 per acre.

Application Information:

Water Volume: Minimum 40 L per acre. Up to 162 L per acre of water may be used under heavy populations to improve coverage.

Pressure: 30 to 40 psi (210 to 275 kPa).

Nozzles: Flat fan with 50 mesh or coarser nozzle screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crop injury may occur if crops are stressed because of drought or flooding. Less than acceptable weed control may be expected if weeds are under stress because of drought, flooding or cool weather.

Weeds, Rates and Staging:

Add Sure-Mix or Merge at 0.5 to 1.0 L per 100 L. Use 1.0 L per 100 L when wild oats or quackgrass are present in the field or when growing conditions are poor.

WEED	STAGE	RATE	
		L/ACRE	ACRES PER CASE
Wild oat*	1 to 5 leaf prior to tillering	0.15	54
	up to 2 tillers	0.20	40
Green foxtail	2 leaf to early tillering	0.15	54
Volunteer wheat, barley & oat*	2 leaf to early tillering	0.15	54
Volunteer corn	2 to 6 leaf stage	0.15	54
Barnyard grass, yellow foxtail, proso millet, fall pannicum, old witchgrass	2 leaf to early tillering	0.20	40
Quack grass suppression	2 to 6 leaf stage	0.20	40
Quack grass season long control	2 to 6 leaf stage	0.30	26

* Best results are likely to occur if applications are made before tillering begins. Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before tillering.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Tank Mixes:

Herbicides:
In Canola: Muster (8 to 12 g / acre).
In Dry Beans (Pinto, Pink, Great Northern and Small Red): Basagran (label rates with Assure II at 0.25 L / acre plus SureMix adjuvant)
In Soybeans:
Pinnacle (2.2 to 3.3 g / acre).
Assure II (0.25 L / acre) plus Pinnacle (2.2 to 3.3 g / acre) plus Basagran Forté (0.71 to 0.91 L / acre) plus Merge or SureMix to control grasses controlled by Assure II alone at 0.20 L / acre plus the broadleaf weeds controlled by Pinnacle and Basagran Forté.
In Established creeping red fescue for seed: Assure II at 0.2 to 0.3 L / acre may be tank mixed with Ally (3 g / acre). Allow 24 hours after application before applying a broadleaf herbicide. If the broadleaf herbicide is applied first, wait 7 days before application of Assure II.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Assure II label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 1 hour of application may reduce control.

Grazing: Do not graze treated crops or cut for feed prior to crop maturity.

Preharvest Interval: See Crop chart above.

Recropping: No restrictions the year after treatment.

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environment: Do not apply within 15 m of sensitive habitats such as shelterbelts, wetlands, sloughs, or woodlots.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Danger – Corrosive to eyes

Warning – Skin irritant

Potential skin sensitizer

Atrazine

Herbicide Group – 5
(Refer to page 27)

Company:

Syngenta
(Aatrex Liquid – PCP#18450).

United Agri Products
(Atrazine 480 – PCP#20997).

Formulations:

480 g / L atrazine formulated as a liquid suspension.

Container sizes - various.

Crops, Rates and Staging:

May be applied to corn (silage, field, sweet) at 0.85 to 1.25 L / acre* using the following applications:

Pre-plant incorporated (PPI).

Pre-emergent surface (after planting but before emergence of weeds and crop) - Recommended only on irrigated fields. Inconsistent weed control will occur if 0.5 inches (1.25 cm) of water / precipitation does not occur within 7 days of application.

Post-emergence - 1 to 6 leaf stage and when corn is less than12 inches (30 cm) tall. Add 1.11 to 2.23 L / acre of oil concentrate or 6.88 L / acre crop oil. Crop injury may occur when Atrazine and oil is applied post-emergence during cold weather.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

* Use the low rate on crops grown on sandy soils, and where weed infestations are light.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Weeds and Staging:

For pre-plant incorporated, pre-emergent and post-emergent (when weeds are less than 4 inches or 10 cm tall) control of the following weeds:

Common purslane	Volunteer clover
Lamb's-quarters	Wild buckwheat
Ragweed	Wild mustard
Redroot pigweed	Wild oats
Smartweed (including lady's-thumb)	Wormseed mustard

Cost (2006 suggested retail price):

Aatrex Liquid - $8.81 per L
Atrazine 480 - $7.30 per L

Application Information:

Water Volume: Minimum 61 L per acre.

Pressure: 30 to 45 psi (200 to 300 kPa).

Nozzles: Flat fan with 50-mesh or coarser screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Post-emergent applications made during periods of cold weather may cause crop lightening. Hot, dry weather preceding post-emergent applications may result in reduced weed control. Atrazine will move with soil if eroded.

Tank Mixes:

Herbicides:
Pre Plant Incorporated✧ - Eradicane (not sweet corn), Dual II Magnum
Pre-Emergent - Dual II Magnum
Post-Emergent*,✧ - Banvel II (not sweet corn), Pardner, Dual II Magnum.

✧ Aatrex Liquid only
* Do not use oils or adjuvants with post-emergent tank mixes.

Fertilizers: For pre-emergence applications, nitrogen solutions or complete liquid fertilizers may replace all or part of the water as a carrier for some formulations of atrazine. Aatrex Liquid may be impregnated onto dry granular fertilizers. Do not impregnate onto nitrate or super-phosphate.

Do not apply atrazine with nitrogen fertilizer after corn has emerged, as crop injury will occur.

Insecticides: None registered.

Note: The above mixes are those listed on the atrazine labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. See the general guidelines for mixing pesticides for more information.

Restrictions:

Rainfall: Within 2 hours of postemergence applications may result in reduced weed control.

Grazing: Do not graze or cut for feed before ear emergence.

Preharvest: Leave at least 45 days from application to harvest.

Recropping: All crops, except corn and triazine-tolerant canola, may be affected the year following the use of atrazine. Flax, peas and fababeans have some tolerance to atrazine residues and are usually not affected by rates of up to 0.9 L/acre applied the previous year. Other more sensitive crops may be affected 2 or more growing seasons after application.

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environment: Do not mix or load within 30 m, or apply within 10 m, of any wells, lakes, streams, ponds, dugouts or sinkholes.

Tank Cleaning:

When finished spraying atrazine, run clean water through the tank, pump and lines. Drain and refill with 1 L of 3% household ammonia solution per 100 L water. Circulate the solution through lines and nozzles. Let solution stand for several hours. Scrub inside surfaces but do not enter tank. Flush sprayer system with water.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Refer to page 14 for additional information.

Hazard Rating:

KEEP OUT OF REACH OF CHILDREN.

Harmful if swallowed.

Attain

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences

Formulation:

The Attain package has 2 components:
Attain A(PCP#24834): 180 g / L fluroxypyr
Attain B (PCP#24833): 564 g / L 2,4-D LV ester.
Both formulated as emulsifiable concentrates.

Container sizes - Attain A - 9.6 L, Attain B - 2 x 8 L.

Crops and Staging:

Spring wheat (including durum), barley - 4 leaf to flag leaf stage.

Forage Grasses for seed production only*:

Seedling grasses at the 4 leaf to flag leaf stage
Established grasses at the 4 leaf to flag leaf stage.

Bromegrass (meadow, smooth)
Fescue (creeping red)
Timothy
Wheatgrass (crested, intermediate)

* NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program , the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled at the 2 to 4 leaf stage, unless specified:

Bluebur
Burdock
Cleavers (1 to 4 whorls)
Clover (sweet)
Cocklebur
Field horsetail*
Flixweed
Goat's beard
Hoary cress*
Kochia
Lamb's-quarters
Mustards (except dog and tansy)
Plantain
Prickly lettuce
Ragweed
Round leaved mallow (1 to 6 leaf)
Shepherd's-purse
Stinkweed
Stork's-bill (1 to 8 leaf)
Sunflower (annual)
Vetch
Volunteer canola
Volunteer flax (1-12cm)
Wild radish
Wild buckwheat (1 - 4 leaf)
Wild mustard

Weeds controlled only when growing rapidly (control may be reduced when weed infestations are heavy):

Blue lettuce*
Dandelion**
Docks
Dog mustard
Field bindweed*
Field peppergrass
Gumweed
Hedge bindweed
Lady's-thumb
Leafy spurge*
Oak-leaved goosefoot
Redroot pigweed
Russian thistle
Smartweed
Tansy
Tartary buckwheat

Weeds suppressed:

Annual sow-thistle
Canada thistle*
Common chickweed up to 3 inches (8 cm) in height
Hemp-nettle (2 to 6 leaf stage)
Perennial sow thistle*

* Top growth only
** Spring rosettes only.

Cost (2006 suggested retail price):

$9.64 per acre.

Rate:

Apply Attain A at 0.24 L / acre and Attain B at 0.40 L / acre. One case of Attain treats 40 acres. Make only one application per year.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa)

Nozzles: Use nozzles that deliver a uniform coverage while minimizing fine droplets prone to drift.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Attain activity is influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought, heat or cold stress) or if extremely heavy infestations exist.

Tank Mixes:

Herbicides:
In spring wheat (including durum) and barley:
Achieve Liquid (0.2 L / acre) plus Turbocharge adjuvant.*
Assert (0.53 to 0.65 L / acre)

In spring wheat (including durum) only:
Horizon (93 mL / acre) plus Score adjuvant.*
Puma^{120} Super (0.16 to 0.31 L / acre)
Everest (17.4 g / acre) plus recommended surfactant

Fertilizer: None registered.

Insecticides: None registered.

Fungicides: None registered.

*Temporary crop injury (Achieve only) or reduced wild oat control may occur with these tank mixes.

Note: The above mixes are those listed on the Attain label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not permit lactating dairy animals to graze fields within 7 days of application. Do not harvest forage or cut hay within 30 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.

Preharvest Interval: Leave 60 days between application and harvest.

Recropping: Wheat, barley, oats, rye, forage grasses, flax, canola, mustard, lentils and peas may be grown the year after an Attain application. There are no recropping restrictions the second year after application.

Aerial Application: Do not apply by air.

Storage: May be frozen. If frozen, bring to room temperature and agitate before use. This product is combustible. Do not store near heat or open flame.

Environment: Avoid drift onto non-target areas. Leave a buffer of 15 meters from water bodies, wetland areas and plants that may be injured by Attain.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Danger Poison.

Warning Eye Irritant.

Caution Skin Irritant.

Avadex MicroActiv/ Extra Strength Avadex BW

Herbicide Group – 8
(Refer to page 27)

Company:

Gowan Canada

Formulation:

Extra Strength Avadex BW (PCP#16759): 480 g / L triallate formulated as an emulsifiable concentrate.

Container size -100 L.

Avadex MicroActiv (PCP#25112): 10% triallate formulated as a granular. Container size -22.7 kg, 454 kg.

Crops, Rates and Application Timing:

Avadex Liquid Rates – Spring Treatment

CROP	APPLICATION TIMING	RATE (L/acre)		ACRES TREATED PER 100 L CONTAINER	
		Organic Matter		Organic Matter	
		4% or less	Greater than 4%	4% or less	Greater than 4%
Spring and durum wheat	Before Seeding*	1.01	1.17	99	85.4
	After Seeding	1.17	1.41	85.4	70.9
Barley	Before and After Seeding	1.17	1.41	85.4	70.9
Canola, flax†, mustard	Before Seeding	1.41	1.86	70.9	53.7
Peas (dry)	Before Seeding	1.41	1.41	70.9	70.9

* Do not apply this product before seeding wheat in soils with 4 percent or less organic matter (brown, dark brown or grey wooded soils) where discers are to be used for seeding. If an air seeder is to be used, it must be equipped with a depth control device to ensure accurate seed placement, otherwise crop injury may occur.

† Excluding Solin (low linolenic acid flax).

Avadex Granular Rates – Fall Treatment

CROP	RATE (KG/ACRE)			ACRES TREATED PER 22.7 KG CONTAINER		
	Organic Matter			Organic Matter		
	Less than 2%*	2-4%	Greater than 4%	Less than 2%*	2-4%	Greater than 4%
Spring and durum wheat	4.45	5.67	6.88	5.1	4.0	3.3
Barley, canaryseed	4.45	5.67	6.88	5.1	4.0	3.3
Canola, flax†, mustard	5.67	6.88	8.90	4.0	3.3	2.6

* Fall treatments conducted under minimum tillage are not recommended on soils with less than 2 percent organic matter.

† Excluding Solin (low linolenic acid flax).

Avadex Granular Rates – Spring Treatment

CROP	APPLICATION TIMING**	RATE (KG/ACRE)		ACRES TREATED PER 22.7 KG CONTAINER	
		Organic Matter		Organic Matter	
		4% or less*	Greater than 4%	4% or less*	Greater than 4%
Spring and durum wheat	Before seeding***	4.45	5.67	5.1	4.0
	After seeding	5.67	6.88	4.0	3.3
Barley, canaryseed	Before and after seeding (barley only)	5.67	6.88	4.0	3.3
Canola, flax†, mustard	Before seeding	6.88	8.90	3.3	2.6

* Minimum tillage treatments must be applied to fields with at least 2 percent organic matter.

** Minimum tillage treatments must be applied 10 to 14 days before seeding or incorporating. For minimum tillage treatments on spring and durum wheat, apply 5.67 kg / acre on soils with 4% organic matter or less and 6.88 kg / acre on soils with greater than 4 percent organic matter.

*** Do not apply this product before seeding wheat in soils with 4% or less organic matter (brown, dark brown or grey wooded soils) where discers are to be used for seeding. If an air seeder is to be used, it must be equipped with a depth control device to ensure accurate seed placement, otherwise crop injury may occur.

† Excluding Solin (low linolenic acid flax).

Seedling Forage Legumes (under-seeded only):

Apply recommended rates for the companion crop.
Alfalfa
Bird's-foot trefoil
Clover (alsike, red, sweet)

Weeds and Staging:

For pre-emergent control of Wild oats.

Cost (2006 suggested retail price):

Liquid: $10.35 to $19.06 per acre.

Granular: $9.43 to $18.87 per acre.

Application Information:

Water Volume (Liquid formulations only):
45 L per acre.

Pressure: 30 psi (200 kPa), liquid formulation only.

Nozzles: Flat fan, liquid formulation only.

General Information: The liquid formulation must be incorporated into soil that is free of lumps or trash. The liquid formulation is recommended for spring use because soils are left in an erosion prone state if the liquid is fall-applied. The granular formulation may be incorporated into trashy soil and is best suited for fall use.

Fall Applications (Conventional Tillage): Apply Avadex granules to fields that are in good working condition, without excessive trash. Heavy trash or lumpy, wet fields may require tillage prior to application. Avadex must be applied after October 1 but before soil freeze-up. Application before October 1 may result in reduced weed control. Only one incorporation is required in the fall. The second incorporation may be done in the fall (before soil freeze-up) or in the spring.

Fall Application (Minimum Tillage): Applications of Avadex granules should be made to standing stubble, chemical fallow, or summerfallow fields that are not prone to erosion. Do not apply to smooth, hard packed soils that may allow granules to drift. If excessive crop residue exists at the time of application, harrowing should be conducted to ensure the granules are in good contact with the soil. Apply when the soil begins to cool (less than 4°C) and within 3 weeks of soil freeze-up. Incorporation can be performed in the spring before seeding or as part of the seeding operation.

Spring Application (Conventional Tillage): Apply Avadex (liquid or granules) to fields that are in good working condition, without excessive trash. Heavy trash or lumpy, wet fields may require tillage prior to application. Liquid formulations should be applied to fields with 30 percent or less trash cover. Avadex may be applied before or after seeding of wheat, barley, or canaryseed and before seeding of canola, flax, mustard or peas (liquid only). If wheat is being seeded into soils with an organic matter content of less than 4 percent, Avadex should be applied after seeding.

Spring Application (Minimum Tillage): Avadex granules should be applied in spring and when the soil temperature is 4°C or less. Apply granules 10 to 14 days before incorporation. Do not apply more than 4 weeks before seeding is intended.

Incorporation:

Conventional Tillage: Avadex applications require 2 incorporations, with the second incorporation at right angles to the first. Using a seeder that provides soil disturbance equivalent to a cultivator may replace 1 incorporation. The first incorporation of the granular formulation should be completed within 48 hours of application and the second incorporation should be delayed an additional 48 hours or more. The first incorporation of the liquid formulation should be completed as soon as possible after spraying, while the second incorporation may be done any time prior to crop emergence.

Incorporate to a depth of 2 inches (5 cm) by setting disc or cultivator implements to cut 3 inches (7.5 cm) into the soil. Mixing the product to greater depths will dilute the herbicide, decrease wild oat control, and may cause injury to cereals. Ensure that cereals are seeded below the treated layer (2 to 3 inches or 5 to 7.5 cm). Incorporations performed after seeding should be conducted with harrows or other suitable tillage equipment adjusted so as not to disturb the seed. Harrowing does not provide effective incorporation if compact soil prevents penetration of harrow teeth, if trash accumulates in the harrow sections, or if the harrows bounce.

Minimum Tillage: Incorporation of Avadex granules in minimum tillage systems is achieved with one high disturbance incorporation, which can be conducted prior to seeding, or as part of the seeding pass. A high disturbance system is one that disturbs the soil enough so that emerged weeds are controlled by the operation (example - air seeder with cultivator shovels). Harrowing after the incorporation operation is recommended for best results.

For optimum results in minimum tillage systems, incorporate when wild oat growth is noticeable in the field, as this will ensure that the soil is warm enough for activation of Avadex.

Under excessively warm or wet conditions between application and crop emergence, control may be reduced. For best results on heavy wild oat infestations, use the conventional tillage guidelines for incorporation.

Summer Fallow: Incorporation can be done by a disc followed by harrowing at right angles, a vibrashank cultivator followed by harrowing at right angles, or double harrowing. The second operation can be delayed until spring. If summerfallow must be ridged to prevent soil erosion the granular formulation should not be used in the fall. Note that fall minimum tillage applied granules do not require incorporation in the fall. If soils must be ridged following application of the liquid formulation, ridging depth should be kept to a minimum as deep ridging may reduce wild oat control and increase crop injury.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Reduced control may result if prolonged cool conditions or dry soil conditions prevail at the time weeds are emerging. If conditions are dry or wild oats germinate from below the treated zone, the weeds may emerge, but will usually be controlled. Thinning of wheat can occur under conditions of heavy rainfall or if cold soil conditions persist as the crop emerges.

Tank Mixes:

Herbicides: Avadex liquid may be tank mixed with liquid formulations of trifluralin for control of wild oats, green and yellow foxtail in wheat and barley. Apply after seeding but prior to crop emergence. Consult the recommendations for trifluralin for rates in different soil types.

Fertilizer: Avadex liquid alone, or tank mixed with liquid formulations of trifluralin, may be tank mixed with liquid fertilizer. Compatibility of the herbicide and liquid fertilizer should be checked. Follow the instructions on the herbicide label prior to adding the herbicide to the spray tank.

Avadex liquid may be sprayed on dry urea fertilizer. A minimum of 150 kg / ha (60 kg / acre) of dry urea fertilizer must be used. Only commercial blending is recommended.

Insecticides: None registered.

Note: The above mixes are those listed on the Avadex labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: At least 0.5 inches (1.5 cm) within 2 weeks of application is required for activation.

Grazing: Do not graze the treated crop or use as hay or feed prior to crop maturity or in year of treatment.

Recropping: Do not seed tame oats the year after treatment.

Aerial Application: May be applied by air with attachments designed for applying low volumes of granules.

Storage: Do not freeze liquid formulations. Store granular formulations in a cool, dry place.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison (liquid formulation)

Skin and Eye Irritant (granular formulation)

Avenge 200 C

Herbicide Group – 8
(Refer to page 27)

Company:

AmVac Corporation, distributed by UAP Canada (PCP#12853)

Formulation:

200 g/L difenzoquat formulated as a solution.
Container size - 20 L.

Crops and Staging:

Apply up the 6 leaf stage of cereal and grass crops:
Barley
Canaryseed
Fall rye (Cougar, Frontier, Kodiak, Puma, Rymin only)
Triticale (Carman and Welsh)
Wheat (AC Barrie, Biggar, Bluesky, CDC Makwa, CDC Teal, Columbus, Conway, Cutler, Fielder, Genesis, Glenlea, Katepwa, Lancer, Leader, Neepawa, Oslo, Pasqua, Selkirk and Wildcat wheat varieties).
Winter wheat (Norstar only)

Forages (only when underseeded to wheat and barley varieties listed above):

Alfalfa	Orchardgrass
Bird's-foot trefoil	Red clover
Bromegrass	Reed canarygrass
Creeping red fescue	Russian wild ryegrass
Crested wheatgrass	Sweet clover
Kentucky bluegrass	Timothy
Meadow fescue	

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Wild oats at the 3 to 5 leaf stage.

Cost (2006 suggested retail price):

$18.56 to $22.47 per acre.

Rate:

Apply Avenge 200 C at 1.42 to 1.72 L/acre. Use the higher rate if wild oat population exceeds 200 wild oats per square metre.

One 20 L container treats 14 to 11 acres.

Application Information:

Water Volume:
Ground application: 40 L per acre.
Aerial application: 8 to 20 L per acre

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan directed 45° forward.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crop injury is worse on cold or hot, humid days than when temperatures are moderate. Best weed control is attained when temperatures are 20 to 30°C, particularly when these temperatures follow application. Do not spray when crop or weeds are wet with heavy dew or rain. Do not apply when crop is under stress from drought, excessive moisture, or heat.

Tank Mixes:

Herbicides:

In wheat and barley:
2,4-D ester (up to 0.45 L/acre of 500 g/L formulation). Do not use amine formulations.
2,4-DB (see 2,4-DB section for rates). May be used on cereals underseeded to forages.
Ally (2 to 3 g/acre)*
Ally + MCPA ester*
Buctril M (0.4 L/acre)
Curtail M (0.8 L/acre)
Dichlorprop + 2,4-D (0.71 L/acre)
MCPA ester (up to 0.45 L/acre of 500 g/L formulation). Do not use amine formulations.
Pardner (0.4 to 0.48 L/acre)
Pardner + MCPA ester
Refine Extra (8 g/acre)
Thumper (0.4 L/acre)

In canaryseed:

MCPA ester (0.38 to 0.45 L/acre of 500 g/L formulation)

Pardner (0.4 L/acre)

*No additional adjuvant required.

Insecticides: None registered

Fertilizers: None registered.

Fungicides: None registered.

Allow a 5-day interval between the application of Avenge and other pesticides.

Note: The above mixes are those listed on the Avenge label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours of application will reduce control.

Grazing: Do not graze or feed treated cereal crop for 8 weeks after treatment. Do not graze or feed treated forages in the year of treatment. Straw from treated fields can be fed to livestock 8 weeks after application.

Preharvest Interval: Do not apply beyond the recommended crop stage.

Recropping: No restrictions the year after treatment.

Aerial Application: May be applied by air.

Storage: May be frozen.

Environment: Do not contaminate water bodies (sloughs, dugouts, lakes, streams, ponds, etc.).

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison

Axial

Herbicide Group – 1
(Refer to page 27)

Company:

Syngenta

Formulation:

Axial (PCP#28150): 100 g/L pinoxaden formulated as an emulsifiable concentrate.

Container size: 1 x 9.7 L jug.

Adigor Adjuvant (PCP#28151): 1x11.3 L jug.

Crops and Staging:

Spring wheat (not including durum), and barley. Do not apply past flag leaf stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates, and Staging:

Apply from the 1 to 6 leaf up to the emergence of the 4th tiller.

At 243 mL/acre (one case treats 40 acres)*:

Foxtail (green and yellow)	Volunteer canary seed
Proso millet	Wild oat
Volunteer oat	

Apply at the 2 to 3 leaf stage for optimum control.

Optimum weed control and yield response occurs when weeds are controlled before tillering.

*Add ADIGOR adjuvant at 280 mL/acre (one case treats 40 acres). Do not tank-mix with any other adjuvant.

Cost (2006 suggested retail price):

N/A

Application Information:

Water Volume: 20 to 40 L per acre.

Pressure: 40 to 45 psi (275 to 310 kPa)

Nozzles: 80° or 110° flat fan nozzles are recommended for optimum spray coverage. Use 50 mesh nozzle screens. Do not use flood type nozzles, controlled droplet application equipment, spray foils or hollow cone nozzles.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not apply to crops that are stressed (frost, low fertility, drought or flooding, disease or insect damage) as crop injury may result.

Weed control may be reduced if Axial is applied under stress conditions such as drought, heat, insufficient fertility, flooding or prolonged cool temperatures.

Tank Mixes:

Herbicides:

Tank-mix Partner*	Product Rates
Buctril M	0.4 L / acre
Frontline***	40 acre / case
MCPA ester (500 formulation)	0.34 L / acre
Mextrol 450M	0.5 L / acre
Refine Extra**	8 g / acre
Refine Extra** + MCPA ester***	8 g / acre + 0.28 L / acre
Trophy	20 acre / case

* Always consult the label of the broadleaf herbicide prior to use.

** Addition of surfactants other than Adigor is not required.

*** Suppression only of green foxtail.

Fertilizers: None registered

Note: The above mixes are those listed on the Axial label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall within 1 hour of Axial application may reduce weed control.

Preharvest: Observe a minimum interval of 60 days after treatment for grain and straw and 30 days after treatment for hay.

Grazing: Must not be grazed or fed to livestock for 7 days after treating crop.

Recropping: For fields treated with Axial herbicide, no crop may be seeded until the following year (emergency re-crop). There are no crop rotation limitations the year following application of Axial herbicide.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. May be frozen.

Environment: Leave 1 metre between the downwind edge of the boom and sensitive terrestrial habitats (grasslands, forested areas, shelterbelts, woodlots, hedgerows, pastures, rangelands and shrub lands) or sensitive freshwater habitats (lakes, rivers, sloughs ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands) of less than 1.0 m deep. Axial may otherwise be applied up to the edge of freshwater habitats 1.0 m deep or greater.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Warning: Eye and skin irritant

Basagran/Basagran Forté

Herbicide Group – 6
(Refer to page 27)

Company:

BASF Canada

Basagran (PCP#12221)
Basagran Forté (PCP#22006)

Formulation:

480 g / L bentazon formulated as a solution in both products. Basagran Forté has a built-in adjuvant.

Basagran container size -2 x 9 L jugs.

Basagran Forté container size -2 x 10 L jugs.

Crops and Staging:

Basagran and Basagran Forté:

CROP	STAGE
Soybeans	No restrictions
Dry beans ***	After the first trifoliate leaf
Corn	No restrictions
Peas*	After 3 pairs of leaves
Fababeans	At least 4 inches (10 cm) tall
Flax	After 2 inches (5 cm) in height

Basagran Forté only:

CROP	STAGE
Forage millet and forage sorghum*	3 to 6 leaf prior to canopy closure

Basagran only:

CROP	STAGE
Spring wheat (excluding durum)**	No restrictions (limited to the 4 leaf to flag leaf by 2,4-D staging)
Solin	After 2 inches (5 cm) in height
Forage grasses for seed production*: Bromegrass, creeping red fescue, crested wheatgrass, meadow foxtail, orchardgrass, timothy.	1 to 7 leaf stage
Forage legumes (seedlings) for seed production*: Alfalfa, alsike clover, red clover, sainfoin.	After the third trifoliate leaf
Alfalfa for seed production.	Established prior to flowering
Sweet clover and sainfoin for seed production.	3 to 10 inches (7.5 to 25 cm) high

* One application per season.

** Basagran only at 0.4 L / acre. Must be tank mixed with 2,4-D (no adjuvant required).

*** Refer to product labels for a list of dry bean types registered for Basagran and Basagran Forté application.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Cost (2006 suggested retail price):

Basagran: $29.43 per L not including adjuvant.

Basagran Forté: $ 23.53 per L adjuvant included in formulation.

Weeds, Rates and Staging:

Add Assist or XA oil concentrate at 0.41 to 0.81 L/acre to Basagran only. Basagran Forté does not require the addition of Assist or XA oil concentrate. If hot, humid conditions prevail (above 28°C and 80% relative humidity), use only the low rate of Assist or XA oil concentrate. Citowett Plus may be used on peas at 0.25 L per 100 L spray mixture.

Apply the rate listed when weeds in the table are within the recommended height:

ANNUAL WEEDS	0.71 L/acre		0.91 L/acre	
	Inches	Maximum Leaf Stage	Inches	Maximum Leaf Stage
Buttercup			2 to 4	6*
Cleavers			1 to 3 whorl stage	
Cocklebur	3 to 7	6*	7 to 12	10*
Common chickweed			1 to 3 weeks after emergence	
Common groundsel			2 to 4	10 cm
Common ragweed			1 to 2	6
Corn spurry			1 to 4	10 cm
Giant ragweed			2 to 6	4
Hairy galinsoga			2 to 3	6*
Hairy nightshade			0.2 to 0.8	6
Lady's-thumb (smartweed)	1 to 3	6*	3 to 8	10
Lamb's-quarters			0.5 to 1.0	8
Purslane			1 to 2	6
Redroot pigweed (suppression only)			0.5 to 1.5	4
Russian thistle (suppression only*)			1 to 3	4*
Shepherd's-purse	Rosette to 4	6*	4 to 10	6
Stinkweed	Rosette to 2	6*	2 to 6	6
Stork's-bill			1.5 to 4	2 to 6 leaf stage
Flower of an hour	1 to 2	6*	2 to 4	10*
Volunteer canola	0.75 to 6	8	0.75 to 6	8
Wild mustard	1 to 5	6*	5 to 10	10
Wild radish			1 to 2	6
PERENNIAL WEEDS	Repeat application 7 to 15 days after first application (if necessary)			
Canada thistle	6 to 8			
Field bindweed	1 to 2.5			
Yellow nutsedge	6 to 8			

*Applies to Basagran Forté only.

Basagran may be applied in wheat at 0.4 L/acre when tank mixed with 2,4-D amine or ester (500 g/L) at 0.3 to 0.4 L/acre to control lady's-thumb, redroot pigweed and daisy fleabane in addition to the weeds controlled by 2,4-D. No adjuvant is required for this mix.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 to 160 L per acre. A minimum of 80 L per acre is recommended for optimum control.*

Pressure: 40 to 60 psi (275 to 425 kPa)*

Nozzles: Flat fan nozzles capable of delivering high water volumes. Direct nozzles 45° forward.

* Higher water volumes and pressures should be used when the weeds are at the upper end of their recommended treatment stage.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Poor results will occur if temperatures are cool. Optimum results are achieved when applied at daytime temperatures between 20 and 28°C. Applications at temperatures greater than 28°C may result in crop injury.

Tank Mixes:

Herbicides:
In soybeans:
Pinnacle at 2.2 to 3.2 g / acre.
In dry beans (in the Red River Valley of Manitoba only):
Basagran only at 0.71 L / acre can be tank mixed with Reflex at 0.23 L / acre plus Agral 90.
In cranberry and black dry beans
Basagran Forté only at 0.7 to 0.91 L / acre can be tank mixed with Pinnacle at 3.2 g / acre.
In spring wheat (not including durum):
Basagran only at 0.4 L / acre can be tank mixed with 2,4-D amine or ester (500 g / L) at 0.3 to 0.4 L / acre. This tank mix DOES NOT need any adjuvant.

Fertilizers: Use of fertilizer mixes is not recommended for use under western Canadian environmental conditions for most crops. Ammonium sulphate may be added to a Basagran spray solution at a rate of 1.5% v / v to improve weed control consistency in dry beans (pinto, great northern, pink and small reds). The risk of bean injury increases with this mixture under hot humid conditions. Use with Assist Oil Concentrate. Not for use with Basagran Forté.

Insecticides: None registered.

Fungicides: None registered.

When mixing Basagran Liquid or Basagran Forté refer to the tank mix partner label for any additional restrictions and precautions.

Allow 4 days between application of Basagran and other herbicides, fertilizers or insecticides.

Note: The above mixes are those listed on the Basagran/ Basagran Forté labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 to 8 hours will reduce control.

Grazing: Allow 30 days between treatment with Basagran Forté and harvest of forage sorghum and millet for hay. Otherwise do not graze treated crops or cut for feed prior to crop maturity.

Preharvest Interval: 50 days for Basagran + 2,4-D in wheat, 84 days for Basagran + Reflex in Dry beans in Manitoba. Other uses are restricted only by appropriate staging.

Recropping: No restrictions the year after application.

Aerial Application: May be applied by air for weed control in dry beans or soybeans only. Use 23 to 45 L / acre water volume. Assist or XA oil concentrate at 0.05 to 0.1 L / acre must be added. Do not use Assist or XA oil concentrate in excess of 0.1 L / acre as substantial crop injury could occur. Do not apply fertilizer mixes in soybean or 2,4-D tank mix in wheat by air. Crop canopy should not cover the weeds.

Storage: May be frozen.

Environment: Avoid drift onto non-target areas. Do not contaminate domestic, irrigation or natural water sources.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison – Basagran

Warning Poison – Basagran Forté

Bromoxynil

Herbicide Groups – 6
(Refer to page 27)

Company:

Bayer CropScience (Pardner) -PCP#18001
Nufarm Agriculture (Koril 235) -PCP#25341
United Agri-Products (Bromotril) – PCP#28276

Formulation:

Pardner: 280 g / L bromoxynil formulated as an emulsifiable concentrate.
Container size -two 8 L containers per case.

Koril 235: 235 g / L bromoxynil formulated as an emulsifiable concentrate.
Container size – two 9.71 L containers per case.

Bromotril: 240 g / L bromoxynil formulated as an emulsifiable concentrate.
Container size – two 9.7 L containers per case.

Crops and Staging:

CROP	STAGE
Barley, oats, triticale, wheat (spring and durum)	2 leaf stage to early flag
Winter wheat	2 to 4 leaf stage (fall application) First growth to early flag leaf (spring application)
Corn (field or sweet)	4 to 8 leaf
Corn (field or sweet) with drop pipes	Beyond 8 leaf
Canaryseed	3 to 5 leaf
Seedling alfalfa	2 to 6 trifoliate leaf stage
Established alfalfa (seed production only)	In spring, before the crop begins to shield weeds. Apply no more than twice in one growing season.
Fall rye	In spring only, from first growth to early flag
Flax (including Solin)	2 to 4 inches (5 to 10 cm)

Registered uses for Pardner & Bromotril only:

CROP	STAGE
Forage millet and sorghum	4 leaf to 8 inches (20 cm)
Seedling grasses (seed production only): Bromegrass, Fescue (creeping red, meadow), Orchard grass, Reed canary grass, Russian wild rye, Timothy, Wheatgrass (crested, intermediate, slender, tall)	2 to 4 leaf (Establishment year only)
Summerfallow	Apply according to weed stage.

Weeds controlled at the 1 to 4 leaf stage:

American nightshade	Cow cockle*
Annual smartweed (green, pale, lady's-thumb)	Kochia**
	Pigweed*
Bluebur	Russian thistle**
Cocklebur	Stinkweed*
Common ragweed	Wild mustard*

* Use high rate.
** Apply before plants are 2 inches high.

Weeds controlled at the 1 to 8 leaf stage:

Common groundsel	Tartary buckwheat
Lamb's-quarters	Wild buckwheat
Tame buckwheat	

Cost (2006 suggested retail price):

Pardner: $8.72 to $10.57 per acre.

Koril: $8.95 to $10.85 per acre.

Bromotril: N / A

Rate:

Pardner: 0.405 to 0.486 L / acre (one 8 L container treats 20 to 16.5 acres).

Canaryseed, flax, seedling alfalfa, forage millet and sorghum - 0.405 L / acre (one 8 L container treats 20 acres).

Koril 235 & Bromotril: 0.486 to 0.57 L / acre (one 9.71 L container treats 20 to 17 acres).

Bromotril: Canaryseed, flax, seedling alfalfa, forage millet and sorghum - 0.486 L / acre (one 9.7 L container treats 20 acres). Use the higher rates if weeds are at the more advanced stages of the recommended treatment stages.

Application Information:

Water Volume:
Corn, Millet & Sorghum: 80 to 120 L per acre.
Seedling grasses: 60 L per acre.
Other crops: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Avoid spraying if temperatures are greater than 25°C. Leaf scorching may occur in corn and flax if applied during or after adverse growing conditions, such as cool and wet or hot (greater than 27°C) and humid weather.

Tank Mixes:

Herbicides:

CROP	TANK MIXES
Spring wheat	2,4-D, Achieve Liquid†, Avenge, Avenge + MCPA (ester only), MCPA, Horizon
Winter wheat	2,4-D, MCPA
Barley	2,4-D, Achieve Liquid†, Avenge, Avenge + MCPA (ester only), MCPA
Oats	MCPA
Fall rye, canaryseed	MCPA*
Flax	MCPA (amine, ester or K salt)
Seedling forage grasses††	MCPA
Corn	Accent† ✧ + surfactant, Atrazine**, Banvel II (field corn only)**

* The ester formulations are preferred but other formulations can be used.

** Do not add oil or surfactant to this mix. Do not use atrazine formulations that contain oil.

† Koril only.

†† Pardner only.

✧ Since the use of this tank mix on corn is registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Users of this tank mix on corn do so at their own risk.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the bromoxynil labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 1 hour of application will reduce control.

Grazing: Do not graze treated wheat, barley, oats, forage millet, sorgum or seedling alfalfa crops or cut for feed within 30 days of application.

Do not graze other treated crops or cut for hay prior to crop maturity.

Recropping: No restrictions.

Aerial Application: Registered for aerial application on wheat and barley. The use of low water volumes, 9 to 18 L per acre may result in less effective weed control than seen with ground application.

Storage: May be stored at freezing temperatures.

Will return to original state by warming to room temperature (20 to 22°C) and agitating thoroughly.

Environment: Avoid drift onto sensitive plants and contamination of water or wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison

Danger Eye and Skin Irritant (Koril 235)

Bromoxynil + 2,4-D Ester

Herbicide Group – 4, 6
(Refer to page 27)

Company:

Bayer CropScience (Thumper)

Nufarm Agriculture (Approve)

Formulation:

Thumper (PCP#22659): 280 g/L bromoxynil and 280 g/L 2,4 D ester formulated as an emulsifiable concentrate. Container size -8 L.

Approve (PCP#28123): 225 g/L bromoxynil and 225 g/L 2,4 D ester formulated as an emulsifiable concentrate. Container size -10 L.

Crops and Staging:

Spring wheat (including durum) and barley at the 4 leaf to early flag leaf stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled at the 1 to 4 leaf stage:

American nightshade	Lady's-thumb
Ball mustard	Night-flowering catchfly
Bluebur	Pale smartweed
Cocklebur	Redroot pigweed
Common ragweed	Shepherd's-purse
Cow cockle	Volunteer canola
Flixweed	Volunteer sunflower
Green smartweed	

Weeds controlled at the 1 to 8 leaf stage:

Common groundsel	Tartary buckwheat
Lamb's-quarters	Wild buckwheat
Stinkweed	Wild mustard
Tame buckwheat (4 leaf stage with Approve)	

Weeds Controlled from 1 to 12 leaf (max. 2 in. tall):

Kochia	Russian thistle

Cost (2006 suggested retail price):

Thumper: $6.88 per acre.
Approve: $6.45 per acre.

Rates:

Thumper: 0.4 L/acre (one 8 L container treats 20 acres).
Approve: 0.5 L/acre (one 10 L container treats 20 acres).

Application Information:

Water Volume:
Ground: 20 to 40 L per acre.
Aerial: 12 to 16 L per acre. Use the higher volume when there is a heavy crop canopy, or when the majority of weeds are cow cockle, smartweed, or pigweed.

Pressure: 40 psi (275 kPa).

Nozzles: 80° or 110° flat fan nozzles. All strainer and nozzle screens must be 50 mesh or coarser.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Less than acceptable weed control may be expected if weeds are under stress because of excessive moisture, drought, or cool weather.

Tank Mixes:

Herbicides:
In spring wheat (including durum) and barley:
Achieve Liquid (0.2 L/acre) plus Turbocharge aduvant
Avenge (1.4 to 1.7 L per acre)
Puma^{120} Super (0.15 to 0.31 L/acre)

In spring wheat (including durum) only:
Horizon (93 to 117 mL per acre) plus Score adjuvant

Insecticides: None registered.

Fungicides: None registered.

Fertilizers: None registered.

Note: The above mixes are those listed on the Bromoxynil + 2,4-D Ester labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze or cut for livestock feed within 30 days of application. Withdraw meat animals 3 days before slaughter.

Preharvest Interval: Do not harvest within 30 days of application.

Recropping: No recropping restrictions the year after application.

Aerial Application: May be applied by air .

Storage: May be frozen. Shake well before using after being frozen.

Environment: Apply when wind is blowing lightly away from non-target areas and water bodies or wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison

Caution Skin and Eye Irritant

Bromoxynil+MCPA ester

Herbicide Groups – 4, 6
(Refer to page 27)

Company:

Bayer CropScience (Buctril M)
Interprovincial Cooperative (Logic M)
Nufarm Agriculture (Mextrol 450)
Mahtkeshim Agan distributed by United Agri Products (Badge)

Formulation:

Buctril M (PCP#18022): 280 g/L bromoxynil present as heptyl and octyl esters and 280 g/L of MCPA ester formulated as an emulsifiable concentrate.
Container size -8 L.

Mextrol 450 (PCP#26999), Badge (PCP#16164) & Logic M (PCP#28109): 225 g/L bromoxynil present as octyl ester and 225 g/L of MCPA ester formulated as an emulsifiable concentrate.
Container size – 10 L.

Crops and Staging:

Field Crops:

All Products:
Barley, oats, spring wheat (including durum) -2 leaf to early flag.
Winter wheat - 2 to 4 leaf stage in the fall or after growth resumes in the spring, but prior to early flag leaf.
Fall rye - apply from the time growth commences in spring to early flag leaf.
Canaryseed - 3 to 5 leaf stage.
Flax, Solin - 2 inches (5 cm) to early bud stage. Best tolerance occurs when flax is 2 to 4 inches (5 to 10 cm) tall.
Corn - 4 to 6 leaf stage.

Seedling forage grasses:
2 to 4 leaf stage.

All Products:

Bromegrass	Russian wild-rye
Fescue (creeping red, meadow)	Timothy
Reed canarygrass	Wheatgrass (crested, intermediate, slender, tall)

Buctril M, Logic M and Badge only:

Fescue (tall)	Orchard grass
Meadow bromegrass	Wheatgrass (streambank)
Meadow foxtail	

Established Forage Grasses:
Timothy for seed (or hay with Buctril M and Mextrol 450 only) - apply prior to the emergence of the flag leaf.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds up to 4 leaf stage:

American nightshade	Kochia**
Annual smartweeds (green, pale, lady's-thumb)	Night-flowering catchfly
Bluebur	Redroot pigweed*
Ball mustard	Russian thistle**
Cocklebur	Scentless chamomile***
Cow cockle	Shepherd's-purse
Flixweed	Volunteer canola
	Volunteer sunflower

* May not be controlled in flax.
** Control before plants are 2 inches tall.
*** Spring seedlings only.

Weed up to 6 leaf stage:
Wild tomato (Buctril M, Logic M & Badge only)

Weeds up to 8 leaf stage:

Common groundsel	Tartary buckwheat
Common ragweed	Wild buckwheat
Lamb's-quarters	Wild mustard
Stinkweed	Wormseed mustard
Tame buckwheat	

Weeds where top growth is controlled:

Canada thistle	Perennial sow-thistle

Cost (2006 suggested retail price):

Buctril M: $6.95 per acre.
Logic M: N/A.
Mextrol 450: $6.95 per acre.
Badge: $6.61 per acre.

Rate:

Buctril M: 0.4 L per acre. One 8 L jug treats 20 acres.
Mextrol 450, Badge & Logic M: 0.5 L per acre. One 10 L jug treats 20 acres.

Application Information:

Water Volume:
Corn: 80 to 120 L per acre.
Flax, Solin: 20 to 40 L per acre.
Cereals: 20 to 40 L per acre.
Seedling forage grasses: 60 L per acre.
Established timothy: 60 L per acre.
Aerial: 8 to 20 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan nozzles.

Refer to specific labels for recommended water volumes.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Best weed control when humidity is high at the time of spraying and for the following day or two. Prolonged cool conditions may result in reduced weed control. Spraying during early morning may increase the risk of flax injury.

Avoid spraying in temperatures greater than 25°C.

Do not apply to flax, canaryseed or corn if daytime temperatures exceed 27°C within 48 hours before or after application.

Tank Mixes:

Herbicide Tank Mix Table:

Products listed below are at label rates for each crop. See labels for details.

CROP & TANK MIXES	Badge	Buctril M	Logic M	Mextrol
Flax (including Solin):				
Fusion		✓		✓
Poast Ultra + Merge adjuvant	✓		✓	✓
Select + Amigo adjuvant	✓	✓	✓	✓
Spring wheat (including durum) and Barley:				
Achieve Liquid				✓
Ally	✓	✓	✓	✓
Avenge	✓	✓	✓	✓
MCPA (amine, ester & K)	✓	✓	✓	✓
Puma[120] Super		✓	✓	✓
Refine Extra (2.7 g/acre)**	✓	✓	✓	✓
Refine Extra + Puma[120] Super (rates above)		✓		✓
Spring wheat (including durum) only:				
Everest				✓
Horizon	✓	✓	✓	✓
Spring wheat only (NOT including durum):				
Everest	✓		✓	
Winter Wheat:				
Refine Extra (2.7 g/acre)**	✓	✓	✓	✓
Oats:				
MCPA (amine, ester & K)	✓	✓	✓	✓
Corn:				
Atrazine	✓	✓	✓	✓

** Requires the addition of a surfactant as per Refine Extra.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the bromoxynil + MCPA ester labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall within 1 hour of application may reduce weed control.

Grazing: Do not graze treated grain or established timothy crops or cut for feed within 30 days of application. Do not graze meadow foxtail in the year of treatment. Do not graze other treated forage grasses within 56 days of treatment.

Preharvest Interval: Do not harvest Flax or Solin within 60 days of application.

Recropping: No recropping restrictions the year after treatment.

Aerial Application: May be applied by air to wheat, barley, and oats only. Must be applied in 8 to 18 L per acre water volume. Use higher water volume when the majority of weeds are cow cockle, smartweed, hemp-nettle, pigweed, and Canada thistle.

Storage: May be frozen.

Environment: Apply when wind is blowing away from sensitive plants and water or wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning (Badge, Buctril M and Logic M)


Danger Poison (Mextrol 450)

Warning Skin Irritant (Mextrol 450)

Casoron

Herbicide Group – 20
(Refer to page 27)

Company:

Crompton Co. (PCP#12533)
(distributed by United Agri Products)

Formulation:

4% dichlobenil formulated as a granular.
Container size - 3 kg, 15 kg.

Crops:

Poplar plantations

Shelterbelts consisting of the following species:

Ash	Honeysuckle
Barberry	Juniper
Birch (cutleaf-weeping)	Lilac
Boxwood	Linden
Caragana	Locust
Cedar (White, Eastern Red)	Maple
	Mock orange
Crabapple	Poplar
Elm	Rose
Euonymus (Burning bush)	Spirea
Forsythia	Willow

NOTE: Do not apply to shelterbelts with mugo pine, firs, hemlock, holly, spruce or other shallow rooted species or injury may result. Do not apply in or around greenhouses. Do not use on light sandy soils.

Weeds and Staging:

Apply in early spring or late fall prior to annual weed emergence, or after cultivation has removed existing weeds.

Annual blugrass	Mustard
Artemisia (absinthe,* wormwood, sage)	Nutsedge*
	Pigweed
Bindweed*	Plantain
Canada thistle*	Purslane
Chickweed	Quack grass*
Dandelion*	Sheep sorel*
Foxtail (green and yellow)	Shepherd's-purse
Groundsel	Smartweed
Horsetail	Sow-thistle
Knotweed	Spurge
Kochia	Vetch*
Lamb's-quarters	Wild buckwheat*
Loosestrife	

* Controlled with fall applications at the higher rates.

Cost (2006 suggested retail price):

$8.78 per kg.

Rates:

45 to 70 kg/acre. At the low rate, a 15 kg bag will treat a 4 yd by 407 yd (4 m by 340 m) strip of shelterbelt. At the high rate, a 15 kg bag will treat a 4 yd by 256 yd (4 m by 214 m) strip of shelterbelt. If application is followed by 0.5 to 1.0 inches (1.3 to 2.5 cm) of irrigation, the lower rates are recommended.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not apply during periods of high soil temperatures (more than 15°C).

Tank Mixes:

None registered.

Restrictions:

Grazing: Do not graze in treated area.

Storage: Store in a cool, dry place. Do not freeze.

Equipment Cleaning:

Refer to page 14.

Hazard Rating:

No specific rating. Keep out of reach of children.

Harmful if swallowed.

Avoid skin or eye contact.

Clethodim

Herbicide Group – 1
(Refer to page 27)

Company:

Arysta LifeScience Canada (Select) - PCP#22625

Bayer CropScience (Centurion) - PCP#27598

Makhteshim-Agan (Arrow) - PCP#28224,
(distributed by United Agri Products)

Formulation:

240 g/L of clethodim formulated as an emulsifiable concentrate. Container size -3 L.

Crops, Rates and Staging:

Crops are tolerant at all growth stages although maximum rates and preharvest intervals must be observed to prevent excess residue in the grain.

To a maximum rate of 80 mL/acre:
Chickpeas*
Dry beans (black, great northern, navy, pink, pinto, red)

To a maximum rate of 150 mL/acre:

Alfalfa (seedling only)	Lentils
Canola	Mustard (brown, oriental, yellow)
Coriander** ✧	
Fenugreek*** ✧	Potato
Field peas	Soybean
Flax (including Solin)	Sunflower

* Apply up to the 9 node stage (7 inches or 18 cm maximum height)

** Apply in the 2 to 5 leaf stage, one application per year. Registered for use with Centurion only.

*** Apply in the 3 to 5 leaf stage, one application per year. Registered for use with Centurion only.

✧ NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

WEED	RATE (mL/ ACRE)	ACRES TREATED PER 3 L CONTAINER	STAGE
Barnyard grass, Green✧ and Yellow foxtail✧, Proso millet, Volunteer cereals (barley✧, canary seed, corn, oat✧, wheat✧), Wild oat✧ (light infestations only*)	50**	60	✧2 to 4 leaf stage when treated with the 60 acre rate. For best results, apply at the 2 to 3 leaf stage.
Moderate to heavy infestations of the above grasses, plus Persian darnel	80	40	2 to 6 leaf stage. For best results, apply at the 2 to 3 leaf stage.
Quackgrass (suppression only)	80	40	2 to 6 leaf stage when 3 to 6 inches (6 to 15 cm) tall. For best results, apply at the 3 to 5 leaf stage.
Quackgrass (season long control)	150***	20	

* The manufacturers do not provide guidelines for weed densities under light infestations. When in doubt as to the level of weed infestation, use the higher rate or contact the manufacturer.

** At this rate, clethodim should not be tank mixed with any other pesticide and should only be applied under the following growing conditions: good crop stand, within the recommended leaf staging (2 to 3 leaf is optimum timing) prior to tillering, light weed infestations, adequate moisture and fertility, absence of stress, and good growing conditions.

*** Apply with 10 L of adjuvant per 1000 L of spray solution (Amigo adjuvant with Centurion and Select, X-Factor adjuvant with Arrow).

Adjuvants: Specific adjuvant must be applied with clethodim. Use 0.5 L of Amigo adjuvant (Centurion or Select) or X-Factor adjuvant (Arrow) per 100 L of spray solution (unless otherwise indicated on the label).

Refer to the product labels for complete mixing instructions. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

Select: $11.08 to $33.25 per acre.

Centurion: $11.06 to $33.20 per acre.

Arrow: N/A.

Application Information:

Water Volume: 20 to 40 L per acre. 40 L per acre under dense weed infestations or dense crop canopies.

Pressure: 40 psi (275 kPa).

Nozzles: Stainless steel 80° flat fan nozzles tilted forward at a 45° angle.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Clethodim will be less effective when plants are stressed by lack of moisture, excessive moisture, low temperature and/or very low relative humidity. Regrowth of tillers may occur if application is made under any of the above stress conditions.

Tank Mixes:

Clethodim may be tank mixed with other pesticides at the 80 to 150 mL/acre rates. Add the recommended amount of adjuvant with all tank mixes unless otherwise indicated.

Herbicides:

In flax (not including solin):
Buctril M (0.4 L/acre)
Curtail M (0.6 to 0.8 L/ac)♦**
MCPA ester (rates for flax).
Lontrel at 0.23 to 0.34 L/acre. ♦

In solin (low linolenic flax):
Buctril M (0.4 L/acre)
Curtail M (0.6 to 0.8 L/ac)♦✧
Lontrel at 0.23 to 0.34 L/acre♦✧

In canola:
Lontrel at 0.17 to 0.34 L/acre♦.
Muster at 8 to 12 g/acres (redroot pigweed is controlled at the 8 g/acre rate of Muster in this tankmix).

In Clearfield canola only:
Pursuit at 40 to 85 mL/acres At the low rate of Pursuit, the following weeds are controlled: chickweed, hemp-nettle, redroot pigweed* stinkweed, volunteer canola (NOT CLEARFIELD varieties) wild buckwheat*, wild mustard, plus weeds listed on clethodim labels.
*Light infestations only. For heavy infestations, use high rate of Pursuit.

In Liberty Link canola only:
Liberty at 1.1 to 1.35 L/acre plus clethodim at 25.5 mL/acre to enhance control of wild oat and volunteer cereals. When mixing add adjuvant to the water first, then Liberty, then clethodim. Consult labels for detailed mixing instructions.

In field peas:
Pursuit at 85 mL/acre

- ♦ Apply with the 80 mL/acre rate of clethodim only.
- ✧ Select only.
- ** Select and Centurion only

Allow 4 days between application of clethodim and any other chemical not recommended as a tank mix combination on the label.

Fertilizer: None registered.

Insecticide: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the clethodim labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 1 hour may reduce control.

Grazing: Do not graze or cut treated crops for forage until 60 days after application of clethodim to annual crops, and 30 days after application to seedling alfalfa.

Preharvest Interval: Do not apply within 60 days of harvesting canola, coriander, dry beans, flax (including Solin), lentils, potatoes, chickpeas (Desi and Kabuli) or mustard (brown, yellow, oriental). Do not apply within 75 days of harvesting soybeans or field peas. Do not apply within 30 days of harvesting seedling alfalfa or fenugreek. Do not apply within 72 days of harvesting sunflowers.

Aerial Application: Do not apply by air.

Storage: May be stored at any temperature. Shake well before use.

Other: Do not apply more than 0.15 L/acre to the same land area per season.

Environment: Leave a buffer of 15 meters between the last pass of the sprayer and open water, wellheads, wetlands and other non-target areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Warning Skin and Eye Irritant

Curtail M

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences (PCP#22764)

Formulation:

50 g/L clopyralid and 280 g/L MCPA ester formulated as an emulsifiable concentrate.

Container size - 8 L.

Crops and Staging:

Spring wheat (including durum), barley, oat, canaryseed* and timothy (established for seed, and hay or forage production)* at the 3 leaf to just before the flag leaf stage.

Flax, solin (low linolenic acid flax) at 2-6 inches (5 to 15 cm) height.

*NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply these uses do so at their own risk.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

The following weeds are controlled at the 1 to 4 leaf stage unless specified:

At 0.61 L/acre (8L jug treats 13 acres) for light infestations of:

Burdock	Ragweed
Canada thistle***	Shepherd's-purse**
Cocklbur	Stinkweed**
Field horsetail****	Sunflower annual
Flixweed**	Volunteer sunflower
Lamb's-quarters	Wild mustard
Plantain****	Wild raddish
Prickly lettuce	Vetch

At 0.81 L/acre (8L jug treats 10 acres) for medium to heavy infestations of the above weeds and:

Annual sow-thistle	Redroot pigweed
Canada Thistle***	Russian pigweed
Common groundsel	Scentless chamomile**
Dandelion*	Smartweed
Kochia (suppression only)**	Tartary buckwheat
Perennial sow-thistle (top growth control only)	Volunteer canola
	Wild buckwheat

* Spring rosettes only.

** 2 to 4 leaf stage, (spring seedlings only for winter annuals).

*** Season long control, some regrowth may occur in the fall. Apply from the 4 inch (10 cm) to prebud stage.

**** Top growth control only.

Cost (2006 suggested retail price):

$8.75 to $11.38 per acre.

Application Information:

Water Volume:
Canary seed and timothy 40 to 80 L per acre
All other crops 40 to 60 L/acre

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan nozzles tilted forward at a 45° angle.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

When weeds are stressed because of drought, flooding, hot or cool (less than 15°C) temperatures, weeds are not actively growing and control may be reduced. Do not apply to weeds stressed longer than 20 days from lack of moisture as poor control can result.

Tank Mixes:

Curtail M at 0.8 L/acre should be used in all tank mixes unless otherwise indicated. See labels for adjuvant rates.

Herbicides:

In spring wheat (including durum) and barley:
Achieve Liquid (0.20 kg/acre) plus Turbocharge adjuvant
Assert (0.52 to 0.64 L/acre) plus water pH adjuster
Puma^{120} Super (0.16 to 0.31 L/acre).

In spring wheat (not including durum) and barley:
Avenge (1.4 to 1.7 L / acre) no adjuvant required ✧*
Refine Extra (8 g / acre) plus a non-ionic surfactant with Curtail M at 0.61 L / acre.

In spring wheat (including durum):
Horizon (93 to 117 mL / acre) plus Score adjuvant.
Everest (17.4 g / acre) plus Ag-Surf or Agral 90 adjuvant.

✧ Use the 0.66 to 0.8 L / acre rate of Curtail M only. The 0.66 L / acre rate will control weeds listed for the 0.61 L / acre rate above.

* See Avenge label for varietal restrictions. Allow a minimum of 5 days between the application of Curtail M plus Avenge and the application of any other pesticide, as poor weed control may result.

Check product labels for additional crop staging restrictions.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Curtail M label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours will reduce control.

Grazing: Do not graze treated fields or cut for hay within 7 days of application.

Preharvest Interval: Leave 60 days between application and harvest.

Recropping: Wheat, barley, oats, rye, corn, flax, canola, forage grasses and mustard may be planted the year after application. Do not underseed crops to forage legumes the year after treatment.

Do not seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Dow AgroSciences representative or retailer for more information before seeding field peas following drought conditions in the previous year.

Do not sow any other crops until the second year after application. Apply manure bedded with straw from treated crops only to the crops listed above.

Aerial Application: Do not apply by air.

Storage: Store in a cool (above 5°C), dry area. If product is frozen, bring to room temperature and agitate before use.

Environment: Avoid drift onto sensitive plants and contamination of water or wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Caution Eye Irritant

Dicamba

Herbicide Group – 4
(Refer to page 27)

Company:

BASF Canada (Banvel II)

Gharda (Oracle) (distributed by United Agri Products and AgWest Inc.)

Formulation:

Banvell I (PCP#23957): 480 g/L dicamba formulated as a solution of a diglycolamine salt.

Oracle (PCP#26722): 480 g/L dicamba formulated as a solution of a dimethylamine salt.

Container sizes -2 x 10 L jugs.

Crops, Rates and Staging:

CROP	STAGE	RATE	
		(mL/acre)	Acres/10 L
Spring wheat*	2 to 5 leaf.	93 to 117	107.5 to 85
Barley*	2 to 5 leaf.	93 to 117	107.5
Oats*	2 to 5 leaf.	93 to 117	107.5 to 85
Canaryseed*	3 to 5 leaf.	117	85
Winter wheat*	In spring -6 to 10 inches (15 to 25 cm) -. prior to flag leaf	93 to 117	107.5 to 85
Spring rye*	2 to 3 leaf	93 to 117	107.5 to 85
Corn, field	Broadcast up to 8 inches (20 cm). When higher, use drop-nozzles.	243 to 505	41 to 20
Corn, field + 2,4-D	Apply no later than 2 weeks prior to tassle emergence and prior to 20 inches (50 cm).	117	85
Red fescue	Seedling: 2 inches (5 cm) tall. Established: up to the flag leaf stage.	243	41
Pastures	Established and actively growing	850 to 1,860 (0.85 to 1.86 L)	11.7 to 5.4
Seedling grasses: Fescue (creeping red, meadow, tall), Meadow foxtail, Orchardgrass, Smooth bromegrass, Timothy, Wheatgrass (crested, intermediate, pubescent, slender, streambank, tall)	2 to 4 leaf	93 to 117	107.5 to 85
Fall stubble	Apply according to weed stage.	1000 (1.0 L)	10
Fall stubble + glyphosate	Apply according to weed stage.	500	20
Pre-seeding cereals	Apply according to weed stage.	127	79
Chemfallow + 2,4-D	Apply according to weed stage.	93 to 117	107.5 to 85
Chemfallow + glyphosate	Apply according to weed stage.	117 to 243	85 to 41

* Should be mixed with a tank mix partner for broad spectrum control

Weeds, Rates and Staging:

Apply to annual broadleaf weeds at the 2 to 3 leaf stage and to winter annual rosettes up to 2 in. (5 cm) across.

Dicamba applied alone at 0.093 to 0.117 L/acre will control:

Cleavers (high rate only)
Cow cockle
Corn spurry
Canada thistle*
Lady's thumb
Perennial sow-thistle*
Smartweed (green)
Tartary buckwheat
Wild buckwheat

Dicamba at 0.25 to 0.5 L per acre control the weeds above plus:

Canada thistle**
Canada fleabane
Field bindweed**
Mustard (hare's-ear, Indian, tumble, wild, wormseed)
Perennial sow-thistle**
Pigweed (redroot, Russian)
Ragweed (common, false, giant)

Dicamba at 0.85 L/acre in rangeland or 1.0 L/acre in summerfallow will control the weeds above plus:

Curled dock*
English daisy
Goldenrod

Dicamba at 1.86 L/acre will control the weeds above plus:

Diffuse knapweed
Goat's-beard
Ground cherry
Pasture sage
Povertyweed
Sheep sorrel
Thyme-leaved spurge

* Top growth only.
** Three consecutive years of treatment are required for complete control.

Canada thistle, Perennial sow-thistle in summerfallow: Apply prior to the bud stage. Must be applied to thistle plants with 6 to 10 inches (15 to 25 cm) of new growth.

Brush control in pastures: When brush is actively growing and is 6 feet (2 m) in height or less (in spring or early summer).

Canada thistle control in fall stubble: When thistles exhibit new growth and at least 2 weeks prior to a killing frost.

Refer to label for full lists of weeds controlled by dicamba plus tank mixes in cereals, pastures, summerfallow and other situations.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Cost (2006 suggested retail price):

Banvel II Cost per L - $38.18.
Oracle Cost per L - $38.83

Application Information:

Water Volume:
Preseeding burnoff: 20 to 45 L per acre.
Annual crops: at least 45 L per acre.
Pastures, summerfallow and stubble: 45 to 90 L per acre.
Corn: 90 to 140 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crop damage (stunting, reduced seed set) can occur if the chemical is applied at any time other than the recommended stage. Do not apply to crop under stress from adverse environmental conditions, such as excess moisture, drought and disease. Apply when air temperature is between 10 and 25°C.

Do not apply:
- when there is a risk of severe temperature fall in the night;
- under high humidity, temperatures above 30°C, or fog conditions, to prevent drift to sensitive crops;
- when wind is blowing toward a nearby sensitive crop;
- when winds are gusty up to 5 mph (8 km / hr).

Tank Mixes:

Herbicides:

	Spring wheat	Winter wheat	Barley	Oats	Seedling grasses
2,4-D amine (500g ai / L) (0.34 L / acre)	✓	✓	✓		✓
MCPA Amine (0.34 L / acre)	✓	✓	✓	✓	✓
MCPA K (0.44 L / acre)	✓	✓	✓	✓	✓
Sencor (0.11 to 0.17 L / acre)	✓		✓		
Ally (2 g / acre)	✓		✓		

In Canaryseed: MCPA amine (0.34 L / acre)
In Corn, Spring rye: 2,4-D amine (500 g ai / L)(0.34 L / acre)
In Corn (Banvel II only):
Accent (13.5 g / acre) plus non-ionic surfactant
Option 35DF (40 g / acre) plus Hasten adjuvant plus liquid 28-0-0 (Banvel II at 0.12 L / acre) (Manitoba only).
Option 2.25 OD (0.63 L / acre) plus liquid 28-0-0 (Banvel II at 0.12 L / acre) (Manitoba only).
In Chemical fallow, stubble: 2,4-D, glyphosate products.
In Red fescue: 2,4-D amine (0.61 L / acre)
In Preseeding burnoff: glyphosate (0.38 L / acre)

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the dicamba labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing and Harvest Intervals:

Canaryseed: Use only as birdseed.

Corn: Do not graze cattle or harvest for silage until 7 days after treatment of dicamba or for at least 12 weeks following dicamba tank mixes with other herbicides.

Cereals, seedling grasses, pasture: If treated vegetation has been consumed by meat animals within 30 days of dicamba application, feed the animal with untreated diet for 30 days before slaughter. Meat animals may graze or feed on treated pasture 30 days after dicamba application without restrictions on slaughter.

Dairy cattle: no restrictions up to 0.50 L / acre.

Use the following guidelines for feeding dicamba treated forage to dairy animals:

RATE/ACRE	DELAY BETWEEN TREATMENT AND HAYMAKING/GRAZING (DAYS)
up to 0.5 L	0
0.501 L to 0.93 L	7
0.931 L to 1.86 L	14
1.861 L to 2.87 L	30

Recropping: Grow only cereals, corn, soybeans or white beans the year after treatment with the 1.0 L / acre rate. Grow only cereals, corn, field beans, soybeans or canola the year after applications of 0.5 L / acre. If applications are made after September 1, or if dry weather persists after application, crop injury may occur the following spring.

Aerial Application: May be applied by air on cereals only. Use a minimum water volume of 8 L / acre.

Storage: May be stored at freezing temperatures.

Environment: Do not contaminate domestic or irrigation water. Do not apply around desirable trees or plants or near the root zone of these plants.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Warning Eye Irritant

Dicamba+Mecoprop+MCPA

Herbicide Group – 4
(Refer to page 27)

Company:

Syngenta (Target – PCP#28028)
United Agri Products (Sword – PCP#27892)
IPCO (Tracker XP – PCP#27790)

Formulation:

275 g / L MCPA, 62.5 g / L mecoprop-P and 62.5 g / L dicamba formulated as a solution.
Container size - 10 L.

Crops and Staging:

All Products:
Cereals:

CROP	STAGE
Barley	2 to 4 leaf (3 leaf for best crop safety)
Canaryseed, Oats, Spring wheat (including durum)	2 to 5 leaf (3 to 4 leaf for best crop safety)
Winter wheat	Spring application only; up to 12 inches (30 cm) high (top leaf extended)
Summerfallow	Fall stubble

Target and Sword only:
Seedling grasses grown for forage only (NOT for seed production)*:
Apply at the 2 to 4 leaf stage.

Creeping red fescue	Orchardgrass
Crested wheatgrass	Smooth bromegrass
Intermediate wheatgrass	Timothy
Meadow foxtail	

Established grasses for forage only (NOT for seed production)*:
Apply up to flag leaf stage.

Bromegrass (meadow, smooth)	Orchardgrass
Fescue (creeping red, meadow, tall)	Timothy
Kentucky bluegrass	Wheatgrass (crested, intermediate, pubescent, slender, streambank, tall, western)
Meadow foxtail	

* NOTE: Use only one application per year by ground. Since applications to forage grasses in western Canada has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to forage grasses are at the risk of the user.

Cost (2006 suggested retail price):

Target: $13.52 per L.
Sword: $13.47 per L.
Tracker XP: $12.25 per L.

Weeds and Staging:

Weeds controlled at the 2 to 3 leaf stage unless otherwise indicated:

Annual sow-thistle	Lamb's-quarters
Ball mustard	Night-flowering catchfly
Canada thistle (6 to 8 inches (15 to 20 cm) and actively growing)*	Perennial sow-thistle*
	Prostrate pigweed
	Redroot pigweed
Cleavers (1-2 whorls)	Russian thistle (less than 2 inches-5 cm)
Common ragweed	Shepherd's-purse
Corn spurry	Stinkweed
Cow cockle	Tall mustard
Field bindweed*	Tartary buckwheat
Flixweed	Volunteer buckwheat
Green smartweed	Volunteer canola
Hedge bindweed*	Volunteer sunflowers
Hemp-nettle (less than 2 pairs of true leaves)	Wild buckwheat
Knotweed	Wild mustard
Kochia	Wormseed mustard
Lady's-thumb	Yellow mustard

* Top Growth Control only

Rates:

0.4 to 0.6 L per acre (10 L treats 25 to 16.7 acres).

Use the higher rate under adverse weather conditions, when weed density is high, for cleavers control, winter annual control and for suppression of Canada thistle and perennial sow-thistle.

Although dicamba + mecoprop-P + MCPA is registered up to the 5 leaf stage of the crop for the rates listed here, the low rate should be used when the crop is at the 5 leaf stage for optimum crop safety.

For Canada thistle, post-harvest or summerfallow application, use 0.81 L / acre (one 10 L container treats 12.4 acres).

Application Information:

Water Volume:
Ground: Minimum 40 L per acre.
Aerial: Minimum of 12 L per acre

Pressure: 30 to 45 psi (200 to 300 kPa).

Nozzles: Flat fan with 50 mesh screens and filters.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Hot and dry or cold and wet weather prior to spraying may result in reduced weed control and increased crop injury. Do not apply within 2 weeks of a killing frost.

Tank Mixes:

Herbicides:
Spring wheat (including durum):
Horizon plus Score adjuvant.
Spring wheat (excluding durum):
Everest*
Wheat and Barley:
Sencor or linuron for chickweed control.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

* May be tank-mixed with Sword only. A reduction in wild oat control may be observed with the tank-mix

Note: The above mixes are those listed on the dicamba +mecoprop-P+MCPA labels only. To check for other possible mixes see the blue chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Activity may be reduced if rainfall occurs within 3 hours of application. Contact manufacturer for more information.

Grazing: Do not graze or harvest for livestock feed within 7 days of application.

Preharvest: Leave at least 80 days from application to harvest.

Recropping: No restrictions the year after application.

Aerial Application: All may be applied by air.

Storage: Do not freeze.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

 Caution Poison

Dichlorprop + 2,4-D

Herbicide Group – 4
(Refer to page 27)

Company/Products:

United Agri Products (Turboprop - PCP#27967)
Nufarm Agriculture (Estaprop Plus - PCP#27968)
IPCO (Dichlorprop-D – PCP# 27966)

Formulation:

300 g/L of dichlorprop and 282 g/L of 2,4-D ester formulated as an emulsifiable concentrate.

Turboprop, Dichlorprop-D: Container sizes – 2 x 10 L, 115 L

Estaprop Plus: Container size – 2 x 10.6 L

Crops and Staging:

Wheat (spring, durum) and barley - 4 leaf until prior to the emergence of the flag leaf.

Winter wheat -in spring after tillering but prior to the emergence of the flag leaf stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Treat weeds when young and actively growing and before they are shielded by the crop. Additional stage restrictions are indicated.

Annual sow-thistle	Ragweed
Ball mustard	Redroot pigweed
Bluebur	Round-leaved mallow
Burdock	Russian pigweed
Canada thistle*	Russian thistle✧✧✧
Cocklebur	Shepherd's-purse
Curled dock*	Smartweed✧✧
Dog mustard	Stinkweed
Flixweed	Stork's-bill
Hare's-ear mustard	Tartary buckwheat✧✧
Indian mustard	Tumble mustard
Kochia✧✧✧	Volunteer canola✧✧
Lady's-thumb✧✧	Volunteer sunflower✧✧
Lamb's-quarters	Wild buckwheat✧✧
Night-flowering catchfly✧	Wild mustard
Oak-leaved goosefoot	Wormseed mustard
Perennial sow-thistle*	Toadflax**

* Top growth control only
** Suppression only. Treat before the majority reach 6 inches (15 cm).
✧ Spring annuals only
✧✧ Treat prior to the 4 leaf stage
✧✧✧ Treat up to 2 inches (5 cm)

Cost (2006 suggested retail price):

Dichlorporp-D: $6.32 per acre
Estaprop Plus: $6.16 per acre
Turboprop: $6.22 per acre.

Rates:

0.71 L / acre
One 10 L container treats 14 acres
One 10.6L container treats 15 acres

Application Information:

Water Volume:
Ground: 20 to 97 L per acre*. Use a minimum of 40 L of water per acre to reduce the risk of drift.
Aerial: Minimum 12 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

* May vary by product. Check label closely.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Applications made under dry conditions may result in reduced control. Crops under stress from adverse environmental conditions, such as excess moisture, frost or drought, may be injured. Best weed control when adequate soil moisture is present and warm temperatures prevail. Do not apply when daytime temperatures exceed 27°C.

Tank Mixes:

Herbicides:

	Spring Wheat (including durum)	Barley
Turboprop	Achieve, Assert, Avenge, Horizon, Puma[120] Super	Achieve, Avenge, Puma[120] Super
Dichlorprop-D or Estaprop Plus	None Registered	None Registered

Note: Always refer to the label or the Guide section of the tank mix partner for additional restrictions on staging and varieties.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on dichlorprop + 2,4-D labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing:
Estaprop Plus, Turboprop and Dichlorprop-D - Do not graze the treated crop or harvest for hay or feed within 40 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.

Recropping: No restrictions the year after application.

Aerial Application: May be applied by air. Refer to specific product labels for full details for application by air.

Storage: May be frozen.

Environment: Do not spray when winds are calm or greater than 8 km / hr. Apply when downwind of sensitive non-target plants, open water and wetland areas. No specific distance is indicated for an upwind buffer zone from these habitats. Contact Manufacturer for details.

Tank Cleaning:

Manufacturers of this product warn that even after thorough cleaning, the use of a sprayer that has come in contact with this product may cause damage to susceptible crops.

Do not use spray equipment to apply other pesticides to crops sensitive to these products. To clean sprayer, rinse all parts several times with water, then fill sprayer with a water / ammonia solution (1 L of a 3% household ammonia solution per 100 L of water) and let stand for 24 hours. Rinse several times after with clean water.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Hazard Rating:

 Warning Poison

Dual II Magnum

Herbicide Group – 15
(Refer to page 27)

Company:

Syngenta (PCP#25729)

Formulation:

915 g / L metolachlor formulated as an emulsifiable concentrate. Container size - 12 L.

Crops and Staging:

Preplant incorporated. In areas with good rainfall or under irrigation, Dual II Magnum may be applied as a pre-emergence surface treatment. When Dual II Magnum is applied to the soil surface, after planting but prior to emergence, at least 0.5 inches of water (1.25 cm) is required within 10 days of application for proper activity.

Corn (field, sweet, silage),	Potatoes
Dry beans (white, kidney and pinto)*	Soybeans
	Sweet white lupins

* Beans should be planted at least 4 cm deep to avoid crop injury.

Weeds and Staging:

Apply prior to weed emergence.

American nightshade	Hairy crabgrass
Barnyard grass	Old witch grass
Eastern black nightshade	Redroot pigweed*
Fall panicum	Smooth crabgrass
Giant foxtail	Yellow foxtail
Green foxtail	Yellow nutsedge**

* Suppression only.
** Preplant incorporated treatment only.

Cost (2006 suggested retail price):

$19.53 to $27.58 per acre.

Rates:

0.5 to 0.7 L / acre (12 L treats 24 to 17 acres). Use higher rates on heavy textured soils or when high populations of weeds are expected. Do not apply to soils with less than 1% or more than 10% organic matter. Make only one application per season.

Application Information:

Water Volume: A minimum of 60 L per acre.

Pressure: 30 to 45 psi (200 to 300 kPa).

Nozzles: Use flat fan nozzles, 50 mesh screens.

Incorporation:

Apply to a firm seed bed free of large clods or lumps. If using tandem disks, set disks to work the soil at a depth of 4 inches (10 cm) and operate at a speed of 6 km / hr (4 mph). If using an S-tine cultivator, set the implement to work the soil to a depth of 4 inches (10 cm) and operate at a speed of 10 km / hr (6 mph). Incorporation equipment should include rolling or western harrows.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

A moderate rainfall or equivalent irrigation is required within 10 days to activate pre-emergent surface treatments. If rain does not occur, a shallow cultivation or use of a rotary hoe is necessary. Drought conditions that persist after any application may reduce annual grass control. On sandy soils, heavy rainfall following application may cause leaching of Dual II Magnum, resulting in reduced weed control.

Tank Mixes:

Herbicides:
In Corn: Aatrex in both PPI and pre-emergent applications.
In Soybeans: Sencor, glyphosate, and Pursuit in both PPI and pre-emergent applications.

Fertilizers: May be applied with liquid fertilizer. May be impregnated onto dry bulk fertilizers (except nitrate fertilizers, superphosphate fertilizers or limestone).

Insecticides: None registered.

Note: The above mixes are those listed on the Dual II Magnum label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: When PPI, 0.5 inches (1.25 cm) of rain is required after application for proper activity.

Grazing: Do not graze the treated immature crop or cut for hay. In corn, immature means before ear emergence.

Recropping: In the year of treatment, seed only corn, soybeans, white beans, potatoes, snap beans, lima beans, processing peas, sweet white lupins, or (a minimum of 4.5 months after application) winter cereals. If Dual II Magnum has been applied in a tank mix with another product, consult those products' labels for additional recropping restrictions.

Aerial Application: Do not apply by air.

Storage: May be frozen.

Environment: Leave a buffer zone of 29 meters between last spray swath and the edge of important wildlife habitats such as wetlands, sloughs and water bodies.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Warning Eye Irritant

Potential Skin Sensitizer

DyVel

Herbicide Group – 4
(Refer to page 27)

Company:

BASF Canada (PCP#16545)

Formulation:

84 g/L of dicamba and 336 g/L of MCPA K+ formulated as a solution.

Container size -2 x 10 L jugs, 110 L.

Crops and Staging:

Spring wheat (including durum), barley or oats -2 to 5 leaf stage.

Winter wheat -apply in spring when crop is 6 to 10 inches (15 to 25 cm) tall but before shot blade stage.

Note: Crop damage can occur if applications are made at other than the recommended crop stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled in the 2 to 4 leaf stage unless otherwise stated:

Ball mustard
Burdock
Cleavers (suppression only)
Cocklebur
Common ragweed
Corn spurry (2 to 3 leaf)
Cow cockle (2 to 3 leaf)
False ragweed
Flixweed
Giant ragweed
Green smartweed
Hare's-ear mustard
Hemp-nettle (2 to 3 leaf)
Indian mustard
Kochia
Lady's-thumb
Lamb's-quarters
Prostrate pigweed
Redroot pigweed
Russian pigweed
Russian thistle
Shepherd's-purse
Stinkweed
Tartary buckwheat
Tumble mustard
Wild buckwheat
Wild mustard
Wild radish
Wormseed mustard
Volunteer canola (2 to 4 leaf)
Volunteer sunflowers

Top growth control:
Canada thistle
Perennial sow-thistle

Cost (2006 suggested retail price):

$6.05 per acre.

Rate:

0.51 L/acre (one 10 L jug treats 19.7 acres).

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 to 45 psi (275 to 310 kPa). To reduce the risk of drift damage to sensitive non-target crops, 20 to 30 psi (150 to 200 kPa) and higher water volumes are recommended.

Nozzles: Flat fan. Select nozzles that produce a low number of fine droplets to reduce the risk of drift.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

For best weed control, apply when temperature is between 10 and 25°C. Do not treat crops under stress from excessive moisture or drought. To avoid crop injury, do not apply when temperature is expected to exceed 30°C, or when there is a risk of a severe drop in overnight temperature.

Tank Mixes:

Herbicides:
In Spring wheat:
Horizon (93 mL / acre) (wild oat control only), plus Score adjuvant.
Horizon (117 mL / acre) (wild oat, green and yellow foxtail), plus Score adjuvant.
Everest – 17.4 g / acre plus non-ionic surfactant

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the DyVel label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze treated crop or cut for hay within 30 days of application.

Preharvest Interval: Leave 60 days between application and harvest.

Recropping: No restrictions the year after treatment.

Aerial Application: May be applied by air. Use a minimum of 8 L / acre water volume.

Storage: May be frozen.

Environment: Avoid drift onto sensitive plants. Leave a distance of 15 m between the outside edge of the sprayed area and sources of domestic, irrigation or natural water or wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

DyVel DSp

Herbicide Group – 4
(Refer to page 27)

Company:

BASF Canada (PCP#27856)

Formulation:

110 g/L dicamba, 295 g/L 2,4-D amine and 80 g/L mecoprop-p formulated as a solution.

Container size - 2 x 10 L jugs, 110 L.

Crops, Rates and Staging:

CROP	STAGE	RATE	
		(L/ACRE)	ACRES PER 10L JUG
Spring wheat (including durum)	3 to 5 leaf	0.34 to 0.45	29 to 22
Barley	2 to 3 leaf	0.34	29
Winter wheat	before crop is 12 inches (30 cm) tall in spring	0.34 to 0.45	29 to 22
Corn (field and sweet)	before corn reaches 6 inches (15 cm) in height with the top leaf extended	0.34 to 0.45	29 to 22
Native range and permanent grass pasture*	Established	1.3	7.7
Fall stubble, summerfallow	Stage according to weed	0.45 to 0.71	22 to 14

* Legumes will be severely injured by this application.

Applications outside the recommended stage may result in crop injury.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

The low registered rate for each crop will control the following weeds at the 2 to 3 leaf stage unless otherwise indicated:

Annual smartweed (including lady's-thumb)
Annual sow-thistle
Cocklebur
Common ragweed
Corn spurry
Hedge bindweed
Knotweed
Kochia
Lamb's-quarters
Mustards (wild, ball, tall, wormseed, yellow)
Pigweed (prostrate, redroot)
Russian thistle
Stinkweed*
Volunteer canola (2 to 4 leaf, prior to bolting)
Volunteer tame buckwheat
Wild buckwheat

Use the high registered rate for each crop to control the following weeds:

Canada thistle (top growth only)***
Cleavers (1 to 2 whorls)**
Cow cockle
Field bindweed†
Flixweed*
Jerusalem artichoke
Round-leaved mallow**
Shepherd's-purse
Tartary buckwheat

† Apply when actively flowering.
* Rosette stage in winter wheat.
** Suppression only.
*** Canada thistle should be treated when 6 to 8 inches (15 to 20 cm) of new growth is present in Fall Stubble and in the early bud stage in Summerfallow.

Rates for Native Range and Pasture will control:

Alder	Poison ivy
Bull thistle	Ragwort
Chicory	Sheep laurel
Goat's-beard	White cockle

The high rate for each crop should be used for all weeds under adverse growing conditions, when weeds are at an advanced stage of growth or when weed densities are high. Guidelines are not provided for weed densities under light or heavy infestations. When in doubt as to the infestation level, use the high rate or contact the manufacturer.

NOTE: It is possible that poisonous plants such as ragworts, hemlocks and death camas could be more palatable to livestock after treatment with DyVel DSp. Suitable precautions should be taken to avoid livestock access when such plants are present.

Cost (2006 suggested retail price):

$4.93 to $6.52 per acre in crop applications.
$6.52 to $10.28 per acre for fall stubble and summer fallow.
$18.83 per acre for pasture

Application Information:

Water Volume:
Cereals: Minimum 40 L per acre.
Corn: 81 to 142 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crops under stress from excess moisture, drought or disease may suffer a setback when this herbicide is applied. Do not apply when temperature exceeds 27°C or when relative humidity is high. Stubble treatments for thistle control in fall should be made at least 2 weeks prior to killing frost.

Do not apply DyVel DSp at wind speed greater than 5 mph (8 km / hr).

Tank Mixes:

Herbicides:
In corn:
Atrazine.
In spring wheat (NOT including durum):
Everest (17.4 g / acre) plus non-ionic surfactant.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the DyVel DSp label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not harvest for livestock feed within 30 days of application. Do not permit lactating dairy animals to graze fields within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter.

Recropping: No restrictions the year after treatment.

Aerial Application: Do not apply by air.

Storage: May be frozen.

Environment: If there are sensitive plants within 400 m, apply only when there is a light breeze away from the sensitive area. Do not contaminate wetlands or water used for domestic or livestock consumption, irrigation or natural habitat.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison

Eclipse

Herbicide Group – 4, 9
(Refer to page 27)

This product is a prepackaged tank mix of Eclipse A (Lontrel page 153) and Eclipse B (Vantage Plus pages 127 to 136). Information listed is restricted to Crop, Weeds, Rates and Cost and other important details. For other detailed information on the component products see the product pages listed above.

Company:

Dow AgroSciences

Formulation:

Eclipse A (PCP#26633): 360 g/L clopyralid formulated as a solution.

Eclipse B (PCP#26634): 360 g/L glyphosate present as an isopropylamine salt and formulated as a solution.

Container size – Each case will treat 30 acres and will consist of 3 split jugs (10 acres/jug). Each split jug will contain 1.12 L of Eclipse A and 5 L of Eclipse B.

Crops and Staging:

Glyphosate tolerant (Roundup Ready) canola varieties only in the 2 to 6 leaf stage. Some yellowing may occur when applied at the 4 to 6 leaf stage. This effect is temporary and will not influence crop growth, maturity or yield.

Weeds and Staging:

No staging is specified on the label.

Annual grasses:

Green foxtail	Volunteer barley
Wild oat	Volunteer wheat

Annual broadleaf weeds:

Chickweed	Redroot pigweed
Cleavers	Russian thistle
Corn spurry	Shepherd's-purse
Cow cockle	Smartweed
Hemp nettle	Stinkweed
Kochia	Wild buckwheat
Lady's-thumb	Wild mustard
Lamb's-quarters	Volunteer canola*
Night-flowering catchfly	Wild tomato

Perennial weeds (season long control):
Canada thistle
Dandelion less than 15 cm diameter**
Dandelion greater than 15 cm diameter***
Perennial sow-thistle**
Quackgrass

* Not including glyphosate tolerant (Roundup Ready) varieties.
** Top growth only.
*** Suppression only.

Cost (2006 suggested retail price):

$14.90 per acre.

Rates:

Apply Eclipse A at 0.112 L/acre and Eclipse B at 0.5 L/acre or 10 acres/jug (30 acres/case).

To prepare spray solution, add Eclipse A to the spray tank. Once it is half filled with water, add Eclipse B as the remaining water is added to the tank.

Application Information:

Water Volume: 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa)

Nozzles: Use nozzles that give even coverage without producing small droplets that are prone to drifting. Do not use with galvanized sprayer tanks since explosive hydrogen gas can be produced.

Restrictions:

Recropping: Wheat, oats, barley, rye (not underseeded to legumes such as alfalfa and clover), forage grasses, flax, canola, mustard and field peas* can be grown the year after application. Apply manure bedded with straw from treated crops only to the crops listed above excluding field peas.

*Do not seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Dow AgroSciences representative or retailer for more information before seeding field peas following drought conditions in the previous year.

Aerial application: Do not apply by air.

Edge

Herbicide Group – 3
(Refer to page 27)

Company:

Dow AgroSciences (PCP#20980)

Formulation:

Edge Granular - 5% ethalfluralin formulated as a granular.
Container size - 25 kg or 544 kg.

Crops and Staging:

Edge can be applied prior to seeding the following crops:

Seedling alfalfa (seed production only)
Canola
Caraway
Coriander
Dry beans (white or kidney)
Fababeans
Lentils (fall application only)†
Mustard (yellow only)
Peas
Safflower
Soybeans
Sunflowers

Weeds and Staging:

For pre-emergent control of the following weeds:

Grasses:
Barnyard grass
Crabgrass
Foxtail (green & yellow)
Volunteer barley*
Volunteer spring wheat
Wild oat*

Broadleaf Weeds:
Cleavers*
Chickweed
Cow cockle
Corn spurry
Hemp-nettle*
Kochia
Lady's-thumb*
Lamb's-quarters
Nightshade*
Prostrate pigweed
Purslane
Redroot pigweed
Russian thistle*
Wild buckwheat

* Suppression only.

Rates:

TIME OF APPLICATION	RATE (KG/ACRE)				
	LIGHT TEXTURED SOILS		MEDIUM TO HEAVY TEXTURED SOILS		
	2-6% Organic Matter / Dark Brown-Black	6-15% Organic Matter Deep Black	2-4% Organic Matter Dark Brown	4-6% Organic Matter Black	6-15% Organic Matter Deep Black
Spring	6.9	8.9	6.9	8.9	8.9 - 11.3
Fall *	8.9	11.3	8.9	11.3	11.3

* To conserve crop residue, one incorporation may be completed in the fall and the second incorporation completed in the spring prior to planting.

Do not apply Edge to peat soils, soils containing less than 2 percent organic matter or soils containing greater than 15 percent organic matter. Application to eroded knolls or grey-wooded soils with highly variable texture or organic matter may result in reduced crop stand, delayed development or reduced yields in either the treated or rotational crop. To reduce the possibility of injury to the treated crop, use good quality certified seed. Seed shallow into a warm, moist, firm seedbed using recommended agronomic practices that will promote rapid and even crop germination and emergence.

† Special instructions for lentils:
Edge is registered for use on lentils for fall application only. One incorporation must be completed in the fall. Seeding depth is critical - do not seed more than 1.5 inches (4 cm) deep. Avoid loose seedbeds and planting into cold soils.

Cost (2006 suggested retail prices):

$15.85 to $26.41 per acre.

Application Information:

Equipment: Apply Edge Granular using a calibrated granular applicator.

Incorporation: Two incorporations are required at right angles for thorough mixing. The first incorporation must be completed within 24 hours of application. When using the granular formulation, delay the second incorporation for at least three days after the first. If applying Edge granular in the fall, it is preferred that both incorporations be done in the fall. The second incorporation may be delayed until spring to conserve trash; however, both incorporations must be done to the same depth.

Incorporate with a tandem disc, discer or field cultivator (Vibrashank type). A cultivator should have 3 to 4 rows of sweeps spaced 8 inches apart and staggered so that no soil is left unturned. Set equipment to work at a depth of 3 to 4 inches (8 to 10 cm). Operate disc implements at 4 to 6 mph (7 to 10 km / hr), cultivators at 6 to 8 mph (10 to 13 km / hr).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crops stressed by cold weather, excessive moisture or drought may be injured by Edge. Dry soil conditions between application and emergence may result in decreased weed control.

Tank Mixes:

None registered.

Restrictions:

Rainfall: No effect once incorporated.

Grazing: Do not graze or cut treated crops for livestock feed prior to crop maturity.

Recropping: Do NOT grow - sugar beets, oats, and small-seeded annual grasses such as timothy, canaryseed and creeping red fescue in rotation following a crop treated with Edge. Do not seed wheat as a rotational crop onto land that has been treated with trifluralin and / or ethalfluralin at oilseed / special crop / barley rates for 2 consecutive crop years Thinning of crop may occur in areas that have received abnormally low amounts of precipitation or in crops that are emerging slowly.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. Edge Granular may be frozen. Do not expose to prolonged sunlight or heat.

Environment: Toxic to fish and other aquatic organisms. Do not contaminate water bodies or wetland areas.

Tank Cleaning:

Refer to page 14.

Eptam 8-E

Herbicide Group – 8
(Refer to page 27)

Company:

Gowan Canada (PCP#11284)

Formulation:

800 g / L of EPTC formulated as an emulsifiable concentrate. Container size - 10 L.

Caution:

The level of weed control may be reduced where Eptam 8-E is used on soils that have been treated with Eradicane or Eptam 8-E the previous growing season. It is expected that the reduction in control will be greater where Eradicane or Eptam 8-E have been used repeatedly for 2 or more years.

Crops, Rates and Staging:

Eptam is applied as a preplant incorporated treatment prior to seeding the following crops:

CROP	RATE (L/ACRE)	ACRES TREATED PER 10 L CONTAINER
Dry and snap beans	1.72 -2.23	5.8 -4.5
Alfalfa, Bird's-foot trefoil Cicer milkvetch** Sweet clover** Sunflowers*	1.72	5.8
Potatoes	1.72 -3.44	5.8 -2.9
Flax*	1.42 -1.72	7.0 -5.8

* May also be applied in late fall prior to freeze-up
** Seed production only

NOTE: The use of Eptam 8-E on flax is not recommended in Saskatchewan because of the risk of crop injury.

Where a rate range appears, use the lower rate on light textured soils and the higher rate on heavy textured soils. Do not use on soils with less than 3 percent organic matter or more than 15 percent organic matter.

Weeds and Staging:

Must be applied prior to the emergence of the following weeds. Emerged weeds will not be controlled.

Barnyard grass
Chickweed*
Corn spurry*
Green foxtail
Hairy nightshade*
Henbit *
Lamb's-quarters*
Nettleleaf goosefoot*
Purslane*
Pigweed (prostrate, redroot, tumble)*
Quackgrass (suppression)**
Volunteer cereals (wheat, barley, oats)
Wild oat
Yellow foxtail
Yellow nutsedge**

* Will be controlled only if treatment is made when conditions are favourable for germination and growth.

** Roots of perennial weeds must be thoroughly chopped prior to application.

Cost (2006 suggested retail price):

$18.25 to $44.20 per acre

Application Information:

Carrier Volume: Minimum of 40 L per acre of water or liquid fertilizer (see label for liquid fertilizer compatibility).

Pressure: 30 to 40 psi (200 to 275 kPa).

Equipment and Nozzles: Since Eptam 8-E is highly volatile, the product must be incorporated immediately. This is best accomplished by mounting spraying equipment directly onto the incorporation equipment (tandem disks, field cultivators on light soil).

May also be applied to cleanly cultivated soil for potatoes, by metering into the irrigation water to achieve the recommended rate per acre ("herbigation" or "chemigation"). See label for detailed instructions.

Incorporation: All growth and stubble should be thoroughly worked into the soil before treatment. Apply to a dry soil surface. Incorporate immediately after application preferably during the spraying operation as Eptam 8-E is volatile. Set disc and cultivator implements to cut to a depth of 4 to 6 inches (10 to 15 cm). A second operation at a right angle to the first is required. The disc or cultivator must be followed with a harrow or other levelling device that extends beyond the width of the implement. Speeds in excess of 5 mph (8 km / h) will result in excessive pulverization and trash destruction leaving the field susceptible to erosion. The maximum recommended tillage depth is 4 inches (10 cm).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crop injury can occur if stressful environmental conditions (cold, wet soils, drought or excessive heat) prevail after seeding. To minimize crop injury, delay seeding 10 days if these conditions prevail at the time of application, or select an alternative product. Very cold or dry soil conditions during weed emergence will reduce control.

Tank Mixes:

Herbicides:
Dry beans (white and red kidney only): Liquid formulations of Treflan and Rival.

Fertilizers: May be mixed with liquid fertilizer.
Compatibility test should be conducted according to instructions on the herbicide label.
Dry bulk fertilizers, except nitrate fertilizers, may be impregnated or coated with Eptam 8-E. The impregnated fertilizer should be spread uniformly onto the field using a double overlap pattern immediately after impregnation. The impregnated fertilizer must be applied to the field when the soil surface is dry to at least 1/2 inch (1.5 cm) depth. The first incorporation must be done immediately after application.

Insecticides: Do not tank mix with insecticides.

Fungicides: None registered.

Note: The above mixes are those listed on the Eptam label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No effect once incorporated. Do not apply prior to pre-irrigation.

Grazing: Do not graze or feed treated crops to livestock in the year of application.

Recropping: Will not injure crops the year after spring application.

Aerial Application: Do not apply by air.

Storage: May be frozen.

Environment: Do not apply within 15 m of fish bearing waters or wildlife habitat.

Soil Type: Do not use on soils with less than 3 percent organic matter as crop injury will result.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Eradicane 8-E

Herbicide Group – 8
(Refer to page 27)

Company:

Gowan Canada (PCP#12239)

Formulation:

800 g/L of EPTC (plus safener) formulated as an emulsifiable concentrate.

Container size - 10 L.

Caution:

The level of weed control may be reduced where Eradicane 8-E is used on soils that have been treated with Eradicane 8-E or Eptam 8-E the previous growing season. It is expected that the reduction in control will be greater where Eradicane 8-E or Eptam 8-E has been used repeatedly for 2 or more years.

Crops and Staging:

Corn (field, sweet* and silage). Eradicane is applied as a preplant incorporated treatment.

* Maximum 2.23 L/acre rate.

Weeds and Staging:

Must be applied prior to the emergence of the following weeds. Emerged weeds will not be controlled.

Barnyard grass
Chickweed
Corn spurry
Foxtail (green and yellow)
Hairy nightshade
Henbit
Lamb's-quarters
Pigweed (prostrate, redroot, tumble)
Purslane
Quackgrass (suppression)
Volunteer cereals (wheat, barley, oats)
Wild oats
Yellow nutsedge

Rates:

USE	RATE (L/ACRE)	ACRES TREATED PER 10 L CONTAINER
Annual weed control in light textured soils	1.72	5.8
Annual weed control in heavy textured soils	2.23	4.5
Quackgrass suppression	3.44	2.9

Cost (2006 suggested retail price):

$22.10 to $44.20 per acre.

Application Information:

Carrier Volume: Minimum of 40 L per acre of water or liquid fertilizer (See label for liquid fertilizer compatibility).

Pressure: 30 to 40 psi (200 to 275 kPa).

Equipment and Nozzles: Since Eradicane 8-E is highly volatile, the product must be incorporated immediately. This is best accomplished by mounting spraying equipment directly onto the incorporation equipment (tandem disks, field cultivators on light soil).

Incorporation:

All growth and stubble should be thoroughly worked into the soil before treatment. Apply to a dry soil surface. Incorporate immediately after application, preferably during the spraying operation, as Eradicane 8-E is volatile. Set disc and cultivator implements to cut to a depth of 4 to 6 inches (10 to 15 cm). A second operation at a right angle to the first is required. The disc or cultivator must be followed with a harrow or other levelling device that extends beyond the width of the implement.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Poor weed control may result if soils are wet during incorporation.

Crop injury may result if soil is cold and wet during germination and emergence. Hot, dry conditions during germination and early crop growth may also lead to crop injury.

Tank Mixes:

Herbicides: Atrazine.

Fertilizers: Dry bulk fertilizers, except nitrate fertilizers, may be impregnated or coated with Eradicane 8-E. The impregnated fertilizer should be spread uniformly onto the field using a double overlap pattern immediately after impregnation. The impregnated fertilizer must be applied to the field when the soil surface is dry to at least 1/2 inch (1.5 cm) depth. The first incorporation must be done immediately after application.

May also be mixed with liquid fertilizer. Conduct a compatibility test prior to mixing in tank. See label for instructions on conducting a compatibility test.

Insecticides: Do not tank mix with insecticides.

Note: The above mixes are those listed on the Eradicane 8-E label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No effect once incorporated.

Grazing: Do not graze treated crops or cut for feed prior to ear emergence.

Recropping: Will not injure crops the year after spring application.

Aerial Application: No labelled restrictions, however, since this product must be incorporated within seconds of application, aerial applications are impractical.

Storage: May be frozen.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

 Caution Poison

Escort

Herbicide Group – 2
(Refer to page 27)

Company:

E. I. duPont Canada (PCP#23005)

Formulation:

60% metsulfuron methyl formulated as a dry flowable. Container size - 0.25 kg.

Crops and Staging:

Pasture, rough turf, and rangeland.

No stage restrictions.

Weeds, Rates and Staging:

For seedling weeds apply to young plants up to 4 inches (10 cm) tall or wide. For established non-woody plants (biennial or perennial) apply up to the early bud stage. For western snowberry, wild rose and other woody species, apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

RATE	WEEDS CONTROLLED	
8 g / acre	Canada thistle*	Common tansy
	Dandelion*	Kochia
	Russian thistle	Scentless chamomile
	Sow-thistle*	Sweet clover
10 g / acre	Above weeds plus:	
	Canada thistle*	Dandelion*
	Sow-thistle*	Western snowberry
12 g / acre	Above weeds plus:	
	Wild rose	Dandelion
	Canada thistle*	Sow-thistle*
40 g / acre**	Balsam poplar	Willow
60 g / acre**	Cherry	Trembling aspen

At all rates add Agral 90, Agsurf, or Citowett at 0.2 L per 100 L of spray solution.

* Suppression only.

** Rangeland only. See label for detailed application instructions.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$14.08 to $21.12 per acre for weeds and up to $105 per acre for woody species.

Application Information

Water Volume: 40 to 91 L per acre for weedy growth and up to 809 L per acre applied to the point of run-off for woody species. See the label for details.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not apply during periods of intense rainfall or to soil saturated with water. Warm, moist conditions following treatment enhance the activity of Escort, while cold, dry conditions may reduce or delay activity. Brush hardened off by cold weather and drought stress may not be controlled.

Tank Mixes:

Herbicides: 2,4-D amine or ester at 0.79 L / acre (500 g / L formulations) plus surfactant.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: May be grazed on the day of treatment.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. May be frozen.

Environment: Leave a 15 meter buffer from the down-wind edge of the spray boom to sensitive areas for rates up to 12 g / acre and 45 meters for rates up to 60 g / acre.

Tank Cleaning:

Escort can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Escort should be flushed out immediately after use. The manufacturer recommends that sprayers used to apply this product be flushed twice with water / ammonia solution (1 L of 3% household ammonia per 100 L of water). All nozzles, screens and filters should be removed and cleaned with water / ammonia solution after applying this product. Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Refer to page 14 for more information on tank cleaning.

Hazard Rating:

Caution Eye Irritant

Everest

Herbicide Group – 2
(Refer to page 27)

Company:

Arysta LifeScience Canada (PCP#26447)

Formulation:

66% flucarbazone-sodium formulated as a water dispersible granule.

Container size -567 g bottle.

Crops and Staging:

Spring wheat (including durum) with 1 leaf to a maximum of 4 main stem leaves plus 2 tillers (6 total leaves). Tank mixes containing 2,4-D provide improved crop safety. Tank mix options are listed in the tank mix section.

Note: Several of the tank mix partners have more limiting staging than Everest. When tank mixing use the most restrictive application state or injury may result.

Weeds, Rates and Staging:

WEED	STAGE	RATE
Green foxtail	1 to 6 leaf, maximum of 4 main stem leaves and 2 tillers	8.7 g / acre
Weeds listed above plus: Wild oat (light infestations) (< 100 plants / m^2), green smartweed, redroot pigweed, shepherd's purse, volunteer canola*, wild mustard , stinkweed (2 to 9 leaf stage)	Grass weeds: 1 to 6 leaf, maximum of 4 main stem leaves and 2 tillers Broadleaf weeds: 2 to 6 leaf stage	11.5 g / acre
Weeds listed above plus: Wild oat (heavy populations) (> 100 plants / m^2), volunteer oat	1 to 6 leaf, maximum of 4 main stem leaves and 2 tillers	17.4 g / acre

Add non-ionic surfactant (Agral 90, Agsurf, Surf 92, Super Spreader, LI700) at 0.25 L per 100 L of spray solution.

* Will not control imidazolinone tolerant (CLEARFIELD) canola volunteers.

Refer to the product label for complete mixing instructions.

A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$10.60 to $21.20 per acre, not including adjuvant and required tank mix partner.

Application Information:

Water Volume:
Spring wheat: 20 to 40 L per acre.
Note: Only Agral 90 and Ag-Surf may be used at the 20 L per acre water rate.
Durum wheat and reduced rate for green foxtail control: 40 L per acre.

Pressure: 30 to 50 psi (200 to 345 kPa)

Nozzles: Flat Fan nozzles at 80° or 110°. Use of flood-jet or controlled droplet application equipment is not recommended.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crop tolerance and weed control may be reduced if applications are made to plants growing under stress. Stress includes saturated or water-logged soil, drought, extreme temperatures, low fertility or visible disease symptoms at application. Adopting practices to increase crop vigor will improve crop tolerance.

Tank Mixes:

Herbicides:

Note: All mixes must be applied with a registered surfactant unless otherwise indicated. Only one registered surfactant is required. Both Everest wild oat rates (17.4 and 11.5 g / acre) can be used in the tank-mixes listed below, unless otherwise indicated. All tank-mix partners listed below may be mixed with Everest at the green foxtail rate (8.7 g / acre).

In spring wheat (including durum):
2,4-D Amine or Ester at recommended rates up to 0.34 L / acre (500 g / L formulation)* ■ ✧
Frontline (40 acres per case)*
Spectrum (20 acres per case)*

In spring wheat (NOT including durum):
2,4-D Amine or Ester at recommended rates up to 0.45 L / acre (500 g / L formulation)✧ ■
Ally at 2 to 3 g / acre + 2,4-D amine or ester up to rates recommended above*■ ✧
Attain (label rate)* ✧ ■
Buctril M (0.4 L / acre)
Curtail M (0.6 to 0.8 L / acre)* ✧
DyVel (0.5 L / acre)*# ✧♦
DyVel DSp (0.34 L / acre)* # ✧ ♦
Estaprop / Dichlorprop D (0.71 L / acre) ■
Express Pack (label rate)* ■
Frontline 2,4-D (label rate)* ■ ✧
Frontline (40 acres per case)*
MCPA Amine or Ester at recommended rates up to 0.45 L / acre (500 g / L formulation)*
Pardner (0.4 L / acre)*#
Prestige (labeled rate)* ✧
Refine Extra (8 g / acre) + 2,4-D (ester* or amine) at rates on this page. ■
Spectrum (20 acres per case)*
Target (0.4 to 0.6 L / acre)* # ✧ ♦
Thumper (0.4 L / acre)■
Unity (40 acres per case)* # ✧

* Registered for use with Agral 90 and Agsurf surfactants only.
✧ Apply in 40 L / acre of water only.
♦ Wild oat control may be reduced with this mix.
■ Mixes containing 2,4-D provide improved crop safety.
\# Tank-mix only with the high wild oat rate of Everest (17.4 g / acre).

Fertilizers: None.

Insecticides: None

Note: The above mixes are those listed on the Everest label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall within 1 hour of application may reduce control.

Grazing: Do not graze treated fields. Mature grain or straw may be fed to livestock.

Preharvest: Leave at least 80 days from application to harvest.

Recropping Interval: Follow the chart below:

Soil Zones and Rotational Crops			
Grey-Wooded	Black	Dark Brown	Brown
Spring Wheat	Spring Wheat	Spring Wheat	Spring Wheat
Barley	Barley	Barley	
Canola (all varieties)	Canola (all varieties)	Canola (all varieties)	
Field Peas*	Durum Wheat	Durum Wheat	
	Field Peas*	Field Peas*	
	Flax	Flax	
	Field Bean		

* Field peas may be grown the year following Everest application in fields where precipitation has been equal to or above the 10 year average during the growing season, and where organic matter content is above 4%, and pH is below 7.5. The company suggests a minimum of 100 mm (4 inches) of rain is needed in the 60 days following application for adequate breakdown to take place.

NOTE: Other rotational crops may also be affected if rainfall is less than the 10 year average for the area. Soils in the grey wooded, black and dark brown soil zones with a combination of low organic matter (less than 2%), light textured soils or high pH (greater than 7.5) (i.e. eroded knolls, sandy soils) may result in delayed growth and development in rotational crops.

Aerial Application: Do not apply by air.

Storage: Store in closed original container in a cool, dry area away from fertilizers, food or feed. Everest herbicide is not affected by storage at freezing temperatures.

Environment: Leave at least 20 m from the downwind edge of the spray swath to sensitive plants like shelterbelts and woodlots and at least 35 m to well heads, sloughs, dugouts, ponds, marshes, ditches, streams, lakes, etc. Avoid drift onto sensitive crops like canola and tame oat. Do not mix or load within 10 m of wellheads, sloughs, dugouts, ponds, marshes, ditches, streams, lakes, etc.

Tank Cleaning:

Everest residues in the spray tank can cause severe injury to sensitive crops at very low concentrations. Sprayers should be cleaned out immediately before using another product.

Follow the steps below:

1. Drain the tank and thoroughly rinse the spray tank, boom and hoses with clean water. Pay particular attention to flushing out any visible deposits.
2. Fill the tank with ammonia/water solution (1 L of 3% household ammonia per 100L of water) and flush the hoses, boom and nozzles with the solution. Circulate for at least 15 minutes. Flush hoses, boom and nozzles once more, then drain the tank.
3. Remove all nozzles, screens and filters and clean in a separate container using an ammonia/water solution as above.
4. Repeat #2.
5. Rinse tank, boom and hoses with clean water. And wash any residue from the outside of the tank.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk. For additional information on tank cleaning see page 14.

Hazard Rating:

Keep out of reach of children

Express Pack

Herbicide Group – 2, 4
(Refer to page 27)

Company:

E. I. duPont Canada

Formulation:

The Express Pack package contains 2 containers:

Express (PCP#22335): 75% tribenuron methyl, formulated as a dry flowable. Container size - 160 grams.

2,4-D herbicide (PCP#23192): 660 g/L 2,4-D LV ester, formulated as an emulsifiable concentrate. Container size - 10 L.

Crops and Staging:

Express Pack: Wheat (spring and durum), barley - 3 leaf up to emergence of the flag leaf.

Summerfallow.

Weeds: Rates and Staging,

Wheat (spring and durum), barley and summerfallow.

Express Pack case treats 40 acres. Apply when weeds are up to 4 inches (10 cm) tall or across, unless otherwise indicated:

Annual sunflower	Redroot pigweed
Ball mustard	Russian pigweed
Canada thistle*	Russian thistle
Cow cockle	Shepherd's-purse✧✧
Flixweed✧✧	Stinkweed✧✧
Hare's-ear mustard	Sweet clover
Indian mustard	Thyme-leaved spurge
Kochia✧✧✧	Tumble mustard
Lamb's-quarters	Wild mustard
Narrow-leaved hawk's-beard✧✧	Wild radish
	Wormseed mustard
Prickly lettuce	Wild buckwheat**✧

* Top growth control
** Suppression only
✧ 1 to 3 leaf stage only
✧✧ Fall rosettes and spring seedlings
✧✧✧ 2 to 10 leaf stage, if SU resistant, use the Banvel II tank mix

Express may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Refer to the product label for complete mixing instructions.

A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

Express Pack: $5.04 per acre.

Application Information:

Water Volume: Minimum 22 L per acre.
Pressure: Not listed on label. Use appropriate pressure for nozzle.

Nozzles: Flat fan nozzles with 50 mesh (or coarser) line strainers and screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not apply to wheat, durum or barley that is stressed by severe weather conditions (frost, drought or water saturated soil, extreme heat), as crop injury may result. Under certain conditions (such as heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures), lightening in crop colour and reduction in crop height may occur.

Tank Mixes:

Herbicides:
In spring wheat (including durum) and barley:
Assert (0.53 to 0.65 L/acre).
Puma^{120} Super (0.155 L/acre -green foxtail rate only)

In spring wheat (excluding durum) and barley:
Banvel II (44.5 mL/acre)

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Express Pack label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check product labels for detailed application directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours will reduce control.

Grazing: Do not graze or feed to livestock within 7 days of application. Withdraw meat animals from treated fields at least 3 days prior to slaughter.

Preharvest: Do not harvest forage or cut for hay within 30 days of application.

Recropping: No restrictions the year after treatment. Canola, flax, lentils and alfalfa may be planted 2 months after an application of Express Pack.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. May be frozen.

Environment: Leave a 15 meter buffer zone between the last spray swath and important wildlife habitats such as shelterbelts, wetlands sloughs, and woodlots.

Tank Cleaning:

Express can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Express should be flushed out immediately after use. The manufacturer recommends that sprayers, including booms and nozzles, be flushed and emptied twice with a water-household ammonia rinse (1 L of 3% ammonia per 100 L of water) followed by a clean water rinse. All nozzles, screens and filters should be removed and cleaned with the above solution after applying this product. Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Hazard Rating:

 Warning Poison

Warning Eye Irritant
Potential Skin Sensitizer

Express TNG†/Express SG

Herbicide Group – 2 (mixed with 4 or 9)
(Refer to page 27)

Company:

E. I. duPont Canada

Formulation:

Express TNG (PCP#27532)†: 75% tribenuron methyl, formulated as a dry flowable.
Container size – 4 x 80 g water soluble packets.

Express SG (PCP#28262): 50% tribenuron methyl, formulated as a soluble granule.
Container size – 486 g water soluble packets.

† Express TNG is no longer manufacturer but supplies may still remain in the distribution system. Express TNG may be removed from this page in future editions.

Express TNG and SG are purchased separately but must be used in a mix with either 2,4-D ester or glyphosate before use.

Crops and Staging:

Express + glyphosate: One day prior to seeding barley and spring wheat (including durum) and summer-fallow.

Express + 2,4-D ester: Summerfallow

Weeds: Rates and Staging,

Pre-seed wheat (including durum) and barley✧✧✧, summerfallow✧.

Express TNG 4 g/acre or Express SG 6 g/acre (one 320 g package of Express TNG or one 486 g container of Express SG treats 80 acres) plus Touchdown iQ at 0.5 L/acre or Roundup Weathermax at 0.34 L/acre:
Weeds controlled by above glyphosate products at these rates plus:

Canada thistle rosettes**
Cow cockle *
Dandelion (up to 6 inches)
Volunteer canola (including glyphosate tolerant varieties) *

Summerfallow✧

Express TNG 4 g/acre or Express SG 6 g/acre (one 320 g package package of Express TNG or one 480 g package of Express SG treats 80 acres) plus 2,4-D ester 0.24 L/acre (LV 700 formulation):
Weeds controlled by 2,4-D ester at 0.24 L/acre plus:
Flixweed✧✧ Stinkweed✧✧

* Express TNG only
** Suppression only
✧ Allow 10 days between summerfallow treatment and tillage.
✧✧ Fall rosettes and spring seedlings.
✧✧✧ Fields treated with Express TNG and glyphosate tank mix can be seeded to wheat, durum wheat and barley 24 hours following treatment.

Express may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Refer to the product label for complete mixing instructions.

A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

Express TNG†: $3.10 per acre

Express SG: $3.16 per acre
plus cost of 2,4-D or glyphosate & adjuvant.

† Because Express TNG was not produced by the manufacturer in 2006, the price listed reflects the suggested retail price from 2005.

Application Information:

Water Volume: 22 to 40 L per acre.

Pressure: Not listed on label. Use appropriate pressure for nozzle.

Nozzles: Flat fan nozzles with 50 mesh (or coarser) line strainers and screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance the activity of Express. Weeds hardened off by environmental stress such as cold weather, drought or excessive heat may not be adequately controlled.

Tank Mixes:

Herbicides:
Prior to spring wheat (including durum) and barley:
Must be mixed with glyphosate.
Summrfallow:
Must be mixed with either glyphosate or 2,4-D ester.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Express labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check product labels for directions.

General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours will reduce control.

Recropping: There are no restrictions one year after treatment. Canola, flax, lentils and alfalfa may be planted 2 months after an application of Express plus 2,4-D

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. May be frozen.

Environment: Leave a 15 meter buffer zone between the last spray swath and important wildlife habitats such as shelterbelts, wetlands sloughs, and woodlots

Tank Cleaning:

Express can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Express should be flushed out immediately after use. Product labels recommend that sprayers, including booms and nozzles, be flushed and emptied twice with a water-household ammonia rinse (1 L of 3% ammonia per 100 L of water) followed by a clean water rinse. All nozzles, screens and filters should be removed and cleaned with the above solution after applying this product. Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk. See product label for more detailed cleaning instructions. For additional information on tank cleaning see page 14.

Hazard Rating:

Warning Eye Irritant

Potential Skin Sensitizer

FlaxMax DLX

Herbicide Group – 1, 4
(Refer to page 27)

Company:

BASF Canada

Formulation:

One case of FlaxMax DLX contains 3 containers (tepraloxydim and Merge in one dual chamber jug):

Tepraloxydim (PCP#27603): 200 g/L tepraloxydim formulated as an emulsifiable concentrate.
Container size – 1.62 L of tepraloxydim.

FlaxMax (PCP#25819): 50 g/L clopyralid and 280 g/L MCPA ester formulated as an emulsifiable concentrate.
Container size – 2 x 8 L.

Merge adjuvant (PCP#24702): 6.1 L.

Crops and Staging:

Flax – (NOT including Solin varieties) 2 to 6 inches (5 to 15 cm) in height. Spraying at an early stage will reduce the risk of crop injury.

Weeds, Rates and Staging:

Tepraloxydim at 81 mL/acre plus FlaxMax at 0.8 L/acre (20 acres per case):

Annual grass weeds at the 1 to 6 leaf, 2 tiller stage:
Green foxtail, volunteer barley, volunteer wheat, wild oat

Annual broadleaf weeds at the 2 to 4 leaf stage:

Annual sow-thistle	Shepherd's-purse
Buckwheat (tartary, wild)	Smartweed
Common groundsel	Stinkweed
Flixweed	Volunteer canola
Lamb's-quarters	Volunteer sunflower
Pigweed (redroot, Russian)	Wild mustard
Scentless chamomile	

Perennial weeds:

Canada thistle	Perennial sow-thistle***
Dandelion**	

** Apply at the spring rosette stage.

*** Top-growth control only.

Flaxmax DLX requires the addition of Merge Adjuvant at 0.75 L per 100L of spray solution.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

N/A

Application Information:

Water Volume: 40 L per acre.

Pressure: 35 to 40 psi (240 to 275 kPa).

Nozzles: Stainless steel 80° or 110° flat fan nozzles.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Most effective control is achieved when grasses are actively growing. Weeds stressed by drought, flooding, hot or prolonged cool temperatures (<15°C) and poor fertility are more difficult to control. Use the higher of the recommended rates for grasses growing under stressed environments. Control may be reduced if temperatures are below 15°C. Retillering may occur under stress conditions or if fertility is low.

Tank Mixes:

Herbicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the FlaxMax DLX label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze the treated crop or cut for feed.

Preharvest Interval: Flax (including Solin) – 60 days

Recropping: Recropping: Wheat, barley, oats, rye, corn, flax, canola, forage grasses and mustard may be planted the year after application. Do not underseed crops to forage legumes the year after treatment.

Do not seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Dow AgroSciences representative or retailer for more information before seeding field peas following drought conditions in the previous year.

Do not sow any other crops until the second year after application. Apply manure bedded with straw from treated crops only to the crops listed above.

Aerial Application: Do not apply by air

Storage: Store in a cool dry location.

Environment: Avoid drift onto sensitive plants and contamination of water or wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Warning eye and skin irritant

FlaxMax Ultra

Herbicide Group – 1, 4
(Refer to page 27)

This product is a prepackaged tank mix of Poast Ultra (page 169) and FlaxMax (Curtail M page 90) . Information listed is restricted to Crop, Weeds, Rates and Cost and other important details. For other detailed information on the component products, such as restrictions and the effects of growing conditions see the product pages listed above.

Company:

BASF Canada

Formulation:

One case of FlaxMax Ultra contains 3 containers:

Poast Ultra (PCP#25820): 450 g/L of sethoxydim formulated as an emulsifiable concentrate.
Container size - 3.65 L.

FlaxMax (PCP#25819): 50 g/L clopyralid and 280 g/L MCPA ester formulated as an emulsifiable concentrate.
Container size – 2 x 8.1 L.

Crops and Staging:

Flax – (NOT including Solin varieties) 2 to 6 inches (5 to 15 cm) in height. Spraying at an early stage will reduce the risk of crop injury.

Weeds, Rates and Staging:

Poast Ultra at 0.13 L/acre plus FlaxMax at 0.61 L/acre (27 acres per case):
Annual grass weeds at the 1 to 6 leaf stage:

Barnyard grass	Persian darnel
Crabgrass	Proso millet
Fall panicum	Volunteer corn
Foxtail (green and yellow)	Witch grass

Annual grass weeds at the 1 to 4 leaf stage:

Volunteer barley	Wild oat
Volunteer wheat	

Annual broadleaf weeds at the 2 to 4 leaf stage:

Flixweed	Stinkweed
Lamb's-quarters	Volunteer sunflower
Shepherd's-purse	Wild mustard

Perennial weeds:
Canada thistle*

Poast Ultra at 0.19 L/acre plus FlaxMax at 0.81 L/acre (20 acres per case):
Annual grass weeds above at the 1 to 6 leaf stage plus:

Volunteer barley	Wild oat
Volunteer wheat	

Annual broadleaf weeds above at the 2 to 4 leaf stage plus:

Annual sow-thistle	Scentless chamomile
Buckwheat (tartary, wild)	Smartweed
Common groundsel	Volunteer canola
Pigweed (redroot, Russian)	

Perennial weeds:

Canada thistle	Perennial sow-thistle***
Dandelion**	

* Apply from 10 cm until early bud stage. This treatment will provide season long control of light Canada thistle infestations with some regrowth in the fall.

** Apply at the spring rosette stage.

*** Top-growth control only.

Merge adjuvant (sold separately) must be used with FlaxMax Ultra. Mix to a final ratio of 0.75 to 1.0 L of Merge per 100 L of spray solution.. When applying 40 L per acre of spray solution use one 8.1 L jug of Merge for every case of FlaxMax Ultra, regardless of whether the 20 or 27 acre per case rate FlaxMax Ultra is being used.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$17.11 to $23.10 per acre

Application Information:

Water Volume: 40 L per acre.

Pressure: 35 to 40 psi (240 to 275 kPa).

Fortress

Herbicide Group – 3, 8
(Refer to page 27)

Company:

Gowan Canada (PCP#19521)

Formulation:

10% triallate and 4% trifluralin formulated as a granular.

Container size -22.7 kg bag, 454 kg container.

Crops and Staging:

Prior to planting wheat (spring and durum), barley, canola, flax (not including Solin), mustard.

Preplant incorporated: In fall after September 15 until soil freeze-up or in the spring prior to seeding crop.

Surface application: Apply in the fall after October 1 and when soil temperature is less than 4°C at a 2 inch (5 cm) depth and delay incorporation until the following spring.

Do not apply to fields with heavy trash cover or after snow has fallen. Some wheat or barley injury may be noted on eroded knolls.

Weeds and Staging:

Pre-emergent control of wild oats, green foxtail, yellow foxtail.

Suppression of lamb's-quarters, kochia, redroot pigweed, Russian thistle, wild buckwheat.

Cost (2006 suggested retail price):

$12.15 to $18.78 per acre.

Rates:

Apply Fortress according to soil organic matter content.

ORGANIC MATTER	RATE (KG/ACRE)					
	RAPESEED (CANOLA), FLAX***, MUSTARD		BARLEY		SPRING WHEAT AND DURUM WHEAT	
	Spring	Fall	Spring	Fall	Spring	Fall
< 2%	5.67	5.67	N.R.*	4.45	N.R.*	N.R.*
2 -4%	5.67	5.67	4.45	5.67	N.R.*	4.45
4 -6%	6.88	5.67	5.67	5.67	4.45	5.67
> 6%	6.88	6.88	6.88	6.88	5.67	5.67**

* N.R. -Not Recommended.
** For fall incorporated applications (not surface) apply 6.88 kg / acre when organic matter exceeds 8 percent.
*** Excluding Solin (low linolenic acid flax).

Application Information:

Fortress may be applied in the fall with or without a fall tillage operation, or in the spring as a preplant incorporated treatment. Before application of this product, the soil must be in good working condition. Application to a field that is wet, lumpy, rough or ridged will result in reduced weed control and promote crop thinning.

Fall Surface Application: Where fields are prone to water and / or wind erosion, and tillage is therefore undesirable, fall surface application should be made when the soil begins to cool (less than 4°C) and within 3 weeks of soil freeze-up, which usually occurs by October 1. Application can be made to standing stubble or to previously worked fields with incorporation delayed until spring. For best results on heavy wild oat infestations, use the incorporated treatment.

Fall Incorporated Application: Fortress must be applied after September 15 and before soil freeze-up. Application prior to September 15 may result in reduced weed control. An incorporation may be completed within 24 hours of application. The second incorporation may be done in the fall (prior to soil freeze-up) or in the spring prior to, or after, seeding. If performed after seeding, it must be completed with harrows prior to emergence of the crop. Fall incorporation is not recommended on soils where a lack of trash cover combined with the required incorporation operation could result in soil erosion.

Spring Application: Fortress can be applied before seeding but must be incorporated within 24 hours of application. The second incorporation must be delayed at least 48 hours after the first and may be performed at any time prior to crop emergence.

Incorporation:

Fortress applications require two incorporations, with the second incorporation at right angles to the first. Seeding with a seeder that provides soil disturbance equivalent to a cultivator may replace one incorporation. Incorporate to a maximum depth of 2 inches (5 cm) by setting disk or cultivator implements to cut a maximum of 3 inches (7.5 cm) into the soil. Mixing the product to greater depths will dilute the herbicide, decrease wild oat control, and may cause injury to cereals. If the second incorporation is conducted after seeding, it should be done with harrows or other suitable tillage equipment adjusted so as not to disturb the seed. Harrowing does not provide effective incorporation if compact soil prevents penetration of harrow teeth, if trash accumulates in the harrow sections, or if the harrows bounce.

Seeding Requirements: Accurate seeding depth control is critical. Thinning of wheat and barley has been known to occur when seeding depth has been inadequate. Ensure that cereals are seeded below the treated layer (2 to 3 inches or 5 to 7.5 cm). Do not seed deeper than 3 inches (7.5 cm). To ensure an even crop stand, increase the usual seeding rate of wheat or barley by 10 percent, especially if soil conditions are cold or dry. See product label for more information.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crop injury can occur on fields where Fortress has been applied and heavy rainfall or cold weather occur after seeding but prior to crop emergence. Seeding under warm soil conditions (greater than 10°C and generally after May 15) will ensure optimum crop germination and emergence and will reduce the risk of crop injury. Very dry conditions in spring or prolonged cool soil temperatures at time of wild oat germination will result in reduced control. Poor results may be expected from incomplete incorporation due to wet, cloddy soil or heavy trash. Ridges left at seeding may disrupt the treated layer and allow weed escapes.

Restrictions:

Rainfall: Moisture is required for activation. Rainfall of at least 0.6 inches (1.5 cm) within 2 weeks of seeding is required to ensure optimum results.

Grazing: Do not graze or cut treated crops for livestock feed prior to crop maturity.

Recropping: Fortress will leave a residue in the soil. Oats, canaryseed, and small seeded forage grasses may be injured if planted within 24 months of application. Do not apply Fortress on land to be sown to wheat if the land has been treated with trifluralin since June 1 of the previous year.

Aerial Application: May be applied by airplane with attachments designed for applying low volumes of granules.

Storage: Store in a cool, dry place.

Hazard Rating:

Skin and Eye Irritant

Frontier

Herbicide Group – 15
(Refer to page 27)

Company:

BASF Canada (PCP#23462)

Formulation:

900 g / L dimethanamid formulated as an emulsifiable concentrate. Container size - 10 L.

Crops and Staging:

Pre-plant incorporated:
Corn (not sweet corn, popcorn, or corn grown for seed)
Dry beans (white and kidney beans only).

Pre-emergence surface:
Dry beans (white and kidney beans only).

Weeds and Staging:

Pre-emergent control of green foxtail.

Rates:

Pre-plant incorporated treatments:
Apply at 0.51 to 0.57 L / acre. Apply at the higher rate on fine-textured or high organic soils and for heavier anticipated weed problems.

Pre-emergence treatments:

SOIL TYPE	RATE (L/ACRE)		
	Less than 3% Organic Matter	3 to 6% Organic Matter	7 to 10% Organic Matter
Coarse Textured Soils	0.45	0.45	0.51
Medium and Fine Textured Soils	0.45	0.51	0.57

Cost (2006 suggested retail prices):

$9.11 to $24.18 per acre.

Application Information:

Water Volume: A minimum of 40 L per acre.

Pressure: 30 to 45 psi (200 to 300 kPa).

Nozzles: Flat fan. Use 16 mesh suction screen, 50 mesh elsewhere on sprayer.

Incorporation: For pre-plant incorporated treatments, apply Frontier as a broadcast treatment and incorporate using a harrow, rolling cultivator or other implement capable of giving uniform, shallow incorporation into the top 5 cm (2 inches) of soil within 7 days of planting. Avoid deeper incorporation or reduced weed control and / or crop injury may result. Immediate incorporation after application is not necessary.

Beans must be planted at least 4 cm (1.5 inches) deep or crop injury may occur.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Rainfall is required within 7 to 10 days of application to activate and move Frontier into the soil zone. If dry conditions persist, a shallow cultivation or the use of a rotary hoe is necessary to move the herbicide into moist soil and control weed escapes. Shallow tillage is important to minimize dilution of the herbicide. If drought conditions persist after pre-plant incorporated or pre-emergence applications, weed control may not be adequate.

Tank Mixes:

Herbicides: None registered.

Fertilizers: May be applied with a liquid fertilizer carrier. Test compatibility of Frontier with liquid fertilizer by mixing a small amount of herbicide with a proportional quantity of liquid fertilizer in a jar. May also be impregnated on dry bulk fertilizers for pre-plant incorporated treatments. A minimum of 90 kg / acre of dry bulk fertilizer should be applied. Do not impregnate Frontier on nitrate fertilizers, superphosphates or limestone.

Insecticides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall after application is important for good weed control.

Grazing: Do not graze or feed the treated corn crop within 40 days of application. Do not graze the treated bean crop or feed bean forage, hay or straw to livestock.

Recropping: Do not plant winter wheat within 120 days of application.

Aerial Application: Not registered.

Storage: Do not freeze. Must be stored under heated warehouse conditions.

Environment: Avoid drift onto non-target plants. Leave a buffer of 15 meters from water bodies and wetland areas.

Tank Cleaning:

The manufacturer does not provide information on tank cleaning. Generally, a mixture of water and household ammonia (1 L per 100 L of water) flushed twice through the tank and circulated through the lines and nozzles is an effective method of cleaning the sprayer tank.

Hazard Rating:

 Caution Poison.

Warning Eye Irritant and Potential Skin Sensitizer.

Frontline 2,4-D

Herbicide Group – 2, 4
(Refer to page 27)

Company:

Dow AgroSciences

Formulation:

The Frontline 2,4-D package has 2 components:

Frontline 2,4-D A (PCP#27242): 50 g / L florasulam formulated as a suspension concentrate

Frontline 2,4-D B (PCP#27243): 564 g / L 2,4-D LV ester formulated as an emulsifiable concentrate.

Container sizes – Frontline 2,4-D A - 1.6 L, Frontline 2,4-D B – 2 x 8 L.

Crops and Staging:

Spring wheat (including durum) in the fully expanded 3 leaf to 6 leaf stage.

When mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Broadleaf weeds controlled at the 2 to 4-leaf stage:

Bluebur	Ragweed (common)
Burdock	Redroot pigweed
Chickweed	Russian thistle
Cleavers	Shepherd's-purse
Cocklebur	Smartweed
Dandelion*	Sow-thistle (annual)
Flixweed	Stinkweed
Kochia**	Sunflower (annual)
Lady's-thumb	Tartary buckwheat
Lamb's-quarters	Vetch
Mustard (ball, wild)	Volunteer canola†
Narrow-leaved hawk's-beard***	Wild buckwheat
Plantain	Wild radish
Prickly lettuce	

Broadleaf weeds suppressed:
Canada thistle (top growth control only)
Hemp-nettle
Perennial sow-thistle (top growth control only)

* Seedlings and overwintered rosettes
** Up to 5 cm (2 inches) in height.
*** Up to 2 leaf stage.
† Including all herbicide-tolerant canola varieties

Cost (2006 suggested retail price):

$6.60 per acre.

Rate:

Frontline 2,4-D A: 40 mL / acre

Frontline 2,4-D B: 0.4 L (400 mL) / acre.

One case treats 40 acres.

Refer to the product label for complete mixing instructions for this product and its mixes.

A general guide to mixing can be found on page 13 of the Guide to Crop Protection.

Application Information:

Water Volume: 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Use nozzles capable of delivering appropriate pressures and volumes.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity of Frontline 2,4-D. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. Under conditions of low crop and high weed density, control may be reduced. Extreme growing conditions such as drought or near freezing temperature prior to, at, or following time of application may reduce weed control and increase the risk of crop injury at all stages of growth.

Tank Mixes:

Herbicides:
In spring wheat (including durum):
Assert 300 SC (0.65 L / acre) plus Acidulate
Everest (17.4 g / acre) plus recommended surfactant.
Puma^{120} Super (0.154 L / acre)

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the Frontline 2,4-D label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. Do not harvest forage or cut hay within 30 days of application.

Pre-harvest Interval: Leave 60 days between application and harvesting mature crop.

Recropping: Wheat, barley, canola, oats and peas may be grown the year following an application.

Aerial Application: Do not apply by air.

Storage: Store in dry, heated area. If frozen, bring to room temperature and agitate before use.

Environment: Leave a buffer zone of at least 30 m between the downwind edge of the boom and the closest edge of non-target areas such as shelterbelts, hedgerows and shrublands. A buffer zone of at least 5 m is required between the downwind edge of the boom and the closest edge of water or wetland areas such as ponds, streams, rivers, prairie potholes and sloughs.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison

May cause skin and eye irritation

Frontline

Herbicide Group – 2, 4
(Refer to page 27)

Company:

Dow AgroSciences

Formulation:

The Frontline package contains 2 components:

Frontline A (PCP#27029): 50 g/L florasulam formulated as a suspension concentrate. Container size - 1.6 L

Frontline B (PCP#27030): 500 g/L MCPA Ester formulated as an emulsifiable concentrate. Container size - 11.2 L.

Crops and Staging:

Spring wheat (including durum), barley and oats in the 2 to 6 leaf stage.

When tankmixing, always check the tankmix partner recommendations for additional staging restrictions.

Weeds and Staging:

Broadleaf weeds controlled at the 2 to 4 leaf stage:

Ball mustard	Russian pigweed**
Burdock**	Shepherd's-purse
Chickweed	Smartweed
Cleavers	Stinkweed
Flixweed	Sunflower (annual)**
Hemp-nettle✧	Volunteer canola (all varieties)*
Lamb's-quarters	Wild mustard
Prickly lettuce**	Wild buckwheat
Ragweed (common)	
Redroot pigweed✧	

Broadleaf weeds suppressed:

Canada thistle ✧†	Stork's-bill✧
Dandelion♦	Sow-thistle (annual)
Plantain†	Sow-thistle (perennial)†

* including all herbicide-tolerant canola varieties
** up to the 4 leaf stage of development
✧ for improved control of this weed add an additional 57 ml per acre of MCPA LV500 (Frontline B)
† top growth control
♦ seedlings and overwintered rosettes less than 15cm (6 inches)

Cost (2006 suggested retail price):

$7.49 per acre.

Rate:

Frontline A: 40 mL per acre

Frontline B: 280 mL per acre

One case treats 40 acres.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: A minimum of 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Use nozzles capable of delivering appropriate pressures and volumes.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity of Frontline. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur. Under conditions of low crop and high weed density, control may be reduced. Extreme growing conditions such as drought or near freezing temperature prior to, at or following time of application may increase the risk of crop injury at all stages of growth.

Tank Mixes:

Herbicides:
In spring wheat (including durum) and barley only:
Assert (0.65 L / acre) plus Acidulate.
Puma^{120} Super (155 mL / acre or 310 mL / acre).

In spring wheat (including durum) only:
Horizon (93 or 117mL / acre) plus Score adjuvant.
Everest at 17.4 g / acre plus Ag-Surf or Agral 90 adjuvant.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Frontline label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze treated crop or cut for feed within 7 days of application.

Preharvest Interval: Do not apply within 60 days of harvest.

Recropping: Wheat, barley, oats, canola and peas may be grown the year following an application.

Aerial Application: Do not apply by air.

Storage: Store in dry, heated area. If frozen, bring to room temperature and agitate before use.

Environment: Leave a buffer zone of at least 30 m between the downwind edge of the boom and the closest edge of non-target areas such as shelterbelts, hedgerows and shrublands. A buffer zone of at least 5 m is required between the downwind edge of the boom and the closest edge of water or wetland areas such as ponds, streams, rivers, prairie potholes and sloughs.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Warning Poison

May cause eye and skin irritation irritation

Fusion

Herbicide Group – 1
(Refer to page 27)

Company:

Bayer CropScience

Formulation:

One case of Fusion contains:

Component 1 (PCP#22845): 80.5 g / L fenoxaprop-p-ethyl. Container size - 3.7 L.

Component 2 (PCP#22850): 125 g / L fluazifop-p-butyl. Container size - 6.5 L.

Both components are formulated as emulsifiable concentrates.

Crops and Staging:

Crops are tolerant at all stages but the following preharvest restrictions apply:

CROP	STAGING
Canola	Do not apply beyond the 5 leaf stage, 80 day preharvest interval
Flax (including Solin)	Tolerant at all growth stages, 80 day preharvest interval
Field peas	Tolerant at all growth stages, 75 day preharvest interval
Lentils	Do not apply beyond the 6 node stage, 82 day preharvest interval
Mustard	Do not apply beyond the 5 leaf stage, 70 day preharvest interval

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Apply at the 1 to 6 leaf stage of the following annual grassy weeds. Apply at the 2 to 3 leaf stage for optimum control. Optimum weed control and yield response occur when weeds are controlled before tillering.

Barnyard grass
Green foxtail
Persian darnel
Volunteer barley
Volunteer wheat
Wild oats

Cost (2006 suggested retail price):

$11.95 per acre.

Rates:

Component 1: 0.19 L / acre.

Component 2: 0.32 L / acre.

One case treats 20 acres.

Refer to the product label for complete mixing instructions for this product and its mixes.

A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 23 to 45 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: 80° or 110° stainless steel flat fan nozzles tilted forward at a 45° angle.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

If daytime temperatures before or after application are very hot and dry with low humidity, reduced control may result. Do not apply to crop that is stressed (frost, heat, drought, water saturated soil, disease, etc.) as crop injury may result.

Tank Mixes:

Herbicides:

Canola:
Lontrel (0.23 L / acre).
Muster (8 to 12 g / acre) (Argentine varieties only).

In Liberty Link canola only:
Liberty at 1.1 to 1.35 L / acre plus Fusion at 40 acres per case may be tank mixed to enhance control of wild oat and volunteer cereals.

Flax (including Solin):
Buctril M (0.40 L / acre)*.

Flax (not including Solin):
MCPA ester or amine (up to 0.34 L / acre - 500 g / L formulations)*.

Curtail M (0.6 to 0.8 L / acre)

* Under adverse conditions, tank mixes of Fusion and Buctril M or Fusion and MCPA may result in reduced grassy weed control.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: An interval of 4 days prior to, or 4 days after application of Fusion is required before any other pesticide can be applied (unless registered in a Fusion tank mix).

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Note: The above mixes are those listed on the Fusion label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Restrictions:

Rainfall: Within 2 hours may result in reduced control. Grazing: Do not graze treated crops or cut for feed prior to crop maturity.

Recropping: If it is necessary to re-seed a crop within 60 days of applying Fusion herbicide, seed only the broadleaf crops listed on the Fusion label. If tank mixed with a broadleaf herbicide refer to both labels for recropping information. There are no recropping restrictions for Fusion herbicide applied alone the year after application.

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environment: Do not apply within 15 m of non-target areas, water or wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Warning Eye and Skin Irritant

Experimental studies have shown that the active ingredient in Component 2 may cause birth defects in laboratory animals. Women capable of bearing children should avoid contact with this product.

glyphosate

Herbicide Group – 9
(Refer to page 27)

Company, Formulation and Cost (2006 suggested retail prices):

Product Name	Company	Salt*	Glyphosate acid content	Formulation	Container size**	Cost
Credit (PCP#25866)	Nufarm Agriculture	IPA	356 g / L	Solution	1, 2, 3	$7.40 per L
Factor (PCP#27090)	IPCO	IPA	356 g / L	Solution	1, 2	$6.75 per L
Factor 540 (PCP#27988)	IPCO	K+	540 g / L	Solution	1, 2, 3	N / A
Glyfos (PCP#24359)	Cheminova	IPA	360 g / L	Solution	1, 2, 3, 5	$8.95 per L
Maverick II (PCP#28245)	Dow AgroSciences	IPA	480 g / L	Solution	1, 2	N / A
Renegade HC (PCP#27946)	Monsanto	K+	540 g / L	Solution	1, 2, 3, 5	$17.19 per L
Roundup Transorb HC (PCP#25344)	Monsanto	K+	540 g / L	Solution	1, 2, 3, 4, 6	$8.97 per L
Roundup Ultra (PCP#27764)	Monsanto	K+	540 g / L	Solution	1, 2, 3, 5	$14.69 per L
Roundup WeatherMax (PCP#27487)	Monsanto	K+	540 g / L	Solution	1, 2, 3, 5	$14.97 per L
Touchdown iQ (PCP#27192)	Syngenta	DA	360 g / L	Solution	1, 2, 3	$9.89 per L
Vantage Plus Max (PCP#27615)	Dow AgroSciences	IPA	480 g / L	Solution	1, 2, 3	N / A

* Salt type: IPA = Isopropylamine, MA = Monoammonium, DA = Diammonium, K+ = Potassium
** Container sizes available: 1) 2 x 10 L, 2) 115 L, 3) 450 L, 4) 750 L, 5) 1000 L, 6) 1200 L, 7) 10.4 kg

Some products may be more effective (not related to higher glyphosate content) under adverse conditions, but that benefit is reduced when applications are made under optimal conditions for activity (i.e. rapid weed growth). When selecting a glyphosate product, consult the product manufacturer or ask your retailer about differences in the level of post-sales support provided for different products.

Crops and Uses:

1. Annual weed control prior to crop emergence or in summerfallow.
2. Quackgrass control prior to seeding or after harvest.
3. Dandelion control (other than preharvest).
4. Canada thistle control in summer-fallow, shelterbelts and post-harvest.
5. Alfalfa control (other than preharvest).
6. Other perennial weeds control in summerfallow, shelterbelts and post-harvest.
7. Patch treatments of perennial weeds in cereals, corn, soybean and forages.
8. Preharvest perennial weed control.
9. For use in Roundup Ready (glyphosate tolerant) crops.
10. Tank Mixes.

1. Annual weed control prior to crop emergence or in summer-fallow:

Weeds listed may not occur on all product labels. Check individual product labels for a specific list of weeds controlled.

PRODUCTS	RATE/ ACRE	SURFACTANT*	WEEDS CONTROLLED	WEED STAGE
356-360 g/L Formulations	0.30 L	0.14 L/acre	Grasses: Green foxtail, volunteer cereals, wild oat (light infestations) Broadleaves: lady's-thumb, stinkweed, volunteer canola (NOT including Roundup Ready varieties), wild mustard.	Less than 3 inches (8 cm) high. Apply at the 1 to 3 leaf stage of wild oat.
480 g/L Formulations	0.23 L			
540 g/L Formulations	0.20 L			
356-360 g/L Formulations	0.40 L	0.14 L/acre	Above weeds plus: Grasses: heavy infestations of wild oat. Broadleaves: suppression of flixweed, kochia.	1 to 3 leaves for wild oat Weeds 3 to 6 inches (8 to 15 cm).
480 g/L Formulations	0.3 L			
540 g/L Formulations	0.27 L			
356-360 g/L Formulations	0.51 to 0.77 L	Not required	Above weeds plus: Grasses: downy brome, Persian darnel. Broadleaves: Canada fleabane, cleavers, common ragweed, flixweed, hemp-nettle, lamb's-quarters, narrow-leaved hawk's-beard, redroot pigweed, Russian thistle, volunteer flax, wild buckwheat.	Canada fleabane, common ragweed, less than 3 inches(8 cm) high. Other weeds less than 6 inches (15 cm). Use high rate for narrow- leaved hawk's-beard 3 to 6 inches (8- 15 cm) or wild buckwheat at the 3-4 leaf stage.
480 g/L Formulations	0.38 to 0.57 L			
540 g/L Formulations	0.33 to 0.51 L			
356-360 g/L Formulations	0.91	Not required	Above weeds plus: Grasses: annual blue grass, crabgrass. Broadleaves: annual sow-thistle, kochia, prickly lettuce, shepherd's purse.	Less than 6 inches (15 cm) high
480 g/L Formulations	0.68 L			
540 g/L Formulations	0.61 L			
356-360 g/L Formulations	1.42 L	Not required	Above weeds.	Greater than 6 inches (15 cm) high
480 g/L Formulations	1.1 L			
540 g/L Formulations	0.94 L			

* Unless otherwise specified, use one of the following surfactants: Agral 90, Agsurf, Companion, Enhance, Frigate or LI 700.

2. Quackgrass control prior to seeding or after harvest:

PRODUCT	RATE PER ACRE	QUACK GRASS STAGE
356-360 g/L Formulations	1.0 L	Season long control of light to moderate infestations. Apply when quack grass is 8 inches (20 cm) tall and has 3 to 4 actively growing leaves. Apply spring or fall.
480 g/L Formulations	0.76 L	
540 g/L Formulations	0.67 L	
356-360 g/L Formulations	1.0 to 2.8 L	Apply when quack grass has 3-4 new leaves for long term control of heavy infestations. Use high rate for sod-bound quack grass (left undisturbed for at least 2 years).
480 g/L Formulations	0.76 to 2.13 L	
540 g/L Formulations	0.67 to 1.89 L	

Do not apply fall treatments if a hard frost has occurred (-5°C) or if plants are drought stressed. Spread straw to allow regrowth and good spray coverage.

Cultivation prior to application will result in reduced control. Do not cultivate between harvest and treatment when using fall applications. If using spring applications on fields which have been fall-tilled, delay application until the quack grass has reached the 4 to 5 leaf stage. (This will occur 1 to 4 weeks later on fall-tilled fields than in undisturbed fields).

Cultivation after application usually will improve control of quack grass. Wait a minimum of 3 days after application before cultivating. If growing conditions are poor (cold or dry), particularly in the fall, waiting longer than 5 days may improve control.

3. Dandelion control (other than preharvest):

Apply up to and including dandelion bloom for best results.

PRODUCT	Less than 6 inches (15 cm) diameter. Allow 3 or more days after treatment before tillage.	Greater than 6 inches (15 cm) diameter. Use higher rate when infestation is heavy.	Prior to seeding or after harvest. Use higher rate for weeds beyond 3 inches (8 cm) or for heavy infestation. Allow 7 or more days after treatment before tillage.
356-360 g/L Formulations	1.0 L/acre	1.5 to 2.0 L/acre	–
Touchdown iQ	1.0 L/acre	1.5 to 2.0 L/acre	1.82 to 2.83 L/acre
450 g/L Formulations	0.76 L	1.13 to 1.5 L/acre	–
540 g/L Formulations	0.67 L/acre	1.0 to 1.34 L/acre	–

4. Canada thistle control in summer-fallow, shelterbelts and post-harvest:

PRODUCT	RATE PER ACRE	WEED STAGING
356-360 g/L Formulations	1.9 to 2.8 L	Bud stage or beyond. Allow at least 5 days after application before tillage.
480 g/L Formulations	1.44 to 2.13 L	
540 g/L Formulations	1.28 to 1.89 L	
356-360 g/L Formulations	1.0 L	Rosettes at least 6 inches (15 cm) in diameter, treated in late summer, following tillage in spring and early summer (up to August 1). Allow thistles to regrow for 5 weeks following last tillage. Wait a minimum of 10 days after application before tillage. Treatment after a mild frost is possible if leaves are green and pliable and plants are actively growing.
480 g/L Formulations	0.76 L	
540 g/L Formulations	0.67 L	
356-360 g/L Formulations	1.9 to 2.8 L	Post-harvest stubble treatment. Allow 8-10 inches (20-25 cm) of new growth before application. Must be sprayed at least 2 weeks prior to killing frost. Straw should be removed or evenly spread to allow for proper regrowth and spray coverage.
480 g/L Formulations	1.44 to 2.13 L	
540 g/L Formulations	1.28 to 1.89 L	

5. Alfalfa Control (other than preharvest):

PRODUCT	RATE PER ACRE	WEED STAGING
356-360 g/L Formulations	1.5 to 2.0 L	Fall control of alfalfa in early bud to full bloom stage. Use high rate when alfalfa populations are high or when perennial grasses are present. Allow at least 5 days before tillage. See tank mix section for minimum tillage or spring applications. Apply with 23-135 L/acre water.
480 g/L Formulations	1.13 to 1.52 L	
540 g/L Formulations	1.0 to 1.34 L	
Touchdown iQ	0.91 to 1.82 L	Prior to seeding or after harvest. Use higher rate for weeds beyond 3 inches (8 cm) in height or for heavy weed infestations. Wait 7 days after application for tillage. Apply in 23-135 L/acre water.

6. Other perennial weed control in summerfallow, shelterbelts and post-harvest:

(Refer to individual product labels for detailed application information.)

	RATES IN UNITS PER ACRE		
Products	Foxtail Barley Seedling to heading*	Toadflax (vegetative stage in summer fallow)	Other Perennial weeds**
356-360 g/L Formulations	1.0 to 2.0 L (0.4 L suppression only)	1.0 L	2.8 to 4.9 L
480 g/L Formulations	0.76 to 1.5 L	0.76 L	2.13 to 3.6 L
540 g/L Formulations	0.67 to 1.34 L/acre	0.67 L	1.89 to 3.24 L

* Late fall applications may provide better control of established foxtail barley plants than spring applications.

** Perennial weeds such as absinthe, blue grass spp., smooth brome grass, cattail, curled dock, field bindweed (bloom stage or beyond), hemp dogbane, hoary cress, poison ivy, purple loosestrife, perennial sow-thistle, and yellow nutsedge applied at the early heading to early bud stage.

7. Patch treatments of perennial weeds in wheat, oat, barley, corn, soybean, forage legumes and forage grasses:

(Refer to individual product labels for detailed application instructions)

Products	RATES PER ACRE				
	Quack grass 8 in (20 cm) tall	Canada thistle Bud or beyond	Milkweed Bud to bloom	Other perennial weeds*	Spot treatment rates for hand held equipment (per 10 L water**)
356-360 g/L Formulations	1.0 to 2.8 L	1.9 to 2.8 L	4.9 L	2.8 to 4.9 L	100 to 200 mL
480 g/L Formulations	0.76 to 2.13 L	1.44 to 2.13 L	3.6 L	2.13 to 3.6 L	76 to 152 mL
540 g/L Formulations	0.67 to 1.89 L	1.28 to 1.89 L	3.24 L	1.89 to 3.24 L	67 to 134 mL

* Perennial weeds such as absinthe, blue grass spp., smooth brome grass, cattail, curled dock, field bindweed (bloom stage or beyond), hemp dogbane, hoary cress, poison ivy, purple loosestrife, perennial sow-thistle, and yellow nutsedge applied at the early heading to early bud stage.

** Use the low rate for quack grass and the high rate for all other perennials.

8. Preharvest perennial weed control:

Do not apply to any crops grown for seed.

Not all glyphosate products are registered for pre-harvest applications on all crop species listed below. Refer to specific glyphosate labels for a list of registered uses and crop species.

Crops registered and rates (per acre):

PRODUCTS	Barley*, bean (dry), canola, field pea, flax (including solin) lentil, oat*, soybean, wheat.	Chickpea**, lupin**, faba bean**	Forages
356-360 g/L Formulations	1.0 L	–	1.0 to 2.0 L
480 g/L Formulations	0.76 L	–	0.76 to 1.52 L
540 g/L Formulations	0.67 L	0.67 L	0.67 to 1.34 L

* Registered for application to barley grown for malt and tame oat grown for milling. Contact malt barley or milling oat buyers prior to application to confirm acceptance of glyphosate-treated grain.

** These applications are registered for use with Roundup WeatherMax only.

NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply Roundup WeatherMax to chickpea, lupin or fava bean, do so at their own risk.

Weeds Controlled with preharvest applications:

Quack grass 4-5 green leaves	Canada thistle and perennial sow-thistle at bud stage or beyond	Common milkweed at bud to bloom stage	Toadflax at bud to full bloom stage	Dandelion from rosette to full bloom stage
X	X	X	X	X

Crop Staging for preharvest applications:

Apply to crops (except forage) when grain moisture is less than 30%. The following chart lists visual symptoms that can be used as guidelines to when 30% grain moisture has been reached.

CROP*	VISUAL SYMPTOMS
Wheat, Barley, Oat	Hard dough stage – a thumbnail impression remains on seed.
Canola	Pods are green to yellow and most seeds are yellow to brown.
Flax (including Solin)	Majority (75 to 80% of bolls) are brown.
Lentil	Lowermost pods (bottom 15%) are brown and rattle when shaken.
Pea	Majority (75 to 80%) of pods are brown.
Chickpea**	Stems are green to brown in colour: pods are mature (yellow to brown in colour); 80%-90% leaf drop (original leaves).
Lupin**	Stems are green to brown in colour: pods are mature (yellow to brown in colour); 80%-90% leaf drop (original leaves).
Faba bean**	Stems are green to brown in colour: pods are mature (yellow to brown in colour); 80%-90% leaf drop (original leaves).
Soybean	Stems are green to brown in colour and pod tissue is brown and dry in appearance (80 to 90% leaf drop).
Dry Bean	Stems are green to brown in colour and pods are mature (yellow to brown) and 80 to 90% of the original leaves have dropped.
Forage	3 to 7 days prior to the last cut before rotation or forage renovation. Do not apply to forage stands that are to be maintained.

* Not all glyphosate products are registered for pre-harvest application on all crops species listed above. Refer to individual crop labels for a list of registered uses and crop species.

9. For Use in Roundup Ready (glyphosate tolerant) Crops:

Roundup Ready Canola:

Weeds, Staging and Rates:

All applications must be made within the cotyledon to 6 leaf stage of RR canola. Temporary yellowing may occur if applied at the 4 to 6 leaf stage of the crop.

Not all glyphosate products are registered for use on Roundup Ready Canola at all rates listed. Refer to individual product labels for specific uses and rates.

PRODUCT	RATES (L/ACRE)	WEEDS CONTROLLED
Single application	356-360 g/L Formulations 0.33 to 0.50 L/acre	Annual grasses: barnyard grass, green foxtail, volunteer cereals, wild oat.
	480 g/L Formulations 0.27 to 0.38 L/acre	Annual broadleaves: annual smartweed spp.**, chickweed, corn spurry, cow cockle*, hemp-nettle, kochia, lamb's-quarters, night-flowering catch-fly*, redroot pigweed, Russian thistle, shepherd's-purse*, stinkweed, volunteer canola (except Roundup Ready varieties), wild mustard, wild tomato.
	540 g/L Formulations 0.22 to 0.34 L/acre	
	356-360 g/L Formulations 0.50 L/acre	Annual broadleaves: cleavers, flixweed, wild buckwheat, stork's-bill , narrow-leaved hawk's-beard.
	480 g/L Formulations 0.38 L/acre	Perennial weeds suppressed: Canada thistle, dandelion, perennial sow-thistle, and season long quack grass control.
	540 g/LFormulations 0.34 L/acre	
Second applications	356-360 g/L Formulations 0.50 L/acre	Annual broadleaves: round-leaved mallow
	480 g/L Formulations 0.38 L/acre	Season long control of following perennials: Canada thistle, foxtail barley, and perennial sow-thistle.
	540 g/L Formulations 0.34 L/acre	
Single application	356-360 g/L Formulations 0.75 L/acre	Season long control of following perennials: Canada thistle and perennial sow-thistle.
	480 g/L Formulations 0.56 L/acre	
	540 g/L Formulations 0.51 L/acre	

* Low rates can be used only up to the 3 leaf stage of the crop otherwise use the high rate.

** Low rates can be used only when annual smartweed is in the 4 to 6 leaf stage.

NOTE: A maximum of 1.0 L/acre (356-360 g/L formulations), 0.76 L/acre (450 g/L formulations) and 0.67 L/acre (540 g/L formulations) per season is allowed in Roundup Ready Canola.

Roundup Ready Corn and Roundup Ready Soybean:

Weeds, Staging and Rates:

All applications must be made within the following crop growth stages.
Corn -1-8 leaf stage Soybean -first trifoliate leaf through flowering.

Not all glyphosate products are registered for use on Roundup Ready Corn and Soybeans at all rates listed. Refer to individual product labels for specific uses and rates.

PRODUCT	RATE (L/ACRE)	WEEDS CONTROLLED
Single application	356-360 g / L Formulations 1.0 L / acre	Grasses: barnyard grass crabgrass spp. foxtail (green, yellow, giant) proso millet quack grass volunteer barley and wheat wild oats Broadleaves: chickweed cleavers corn spurry cocklebur cow cockle common milkweed (suppression only) common ragweed eastern-black flowering night-shade flixweed hemp-nettle kochia lamb's-quarters narrow-leaved hawk's-beard night-flowering catchfly pigweed (smooth, redroot) round-leaved mallow Russian thistle shepherd's-purse smartweed spp. stinkweed stork's-bill velvetleaf volunteer canola (except Roundup Ready varieties) wild mustard wild buckwheat wild tomato yellow nutsedge (suppression)
	480 g / L Formulations 0.76 L / acre	
	540 g / L Formulations 0.67 L / acre	
Second applications	356-360 g / L Formulations 1.0 L / acre	Late flushes of heavy infestations of the above weeds plus control of: Canada thistle, common milkweed, field bindweed, perennial sow-thistle, yellow nutsedge
	480 g / L Formulations 0.76 L / acre	
	540 g / L Formulations 0.67 L / acre	

Additional Weeds, Staging and Rates in Roundup Ready Soybean and Corn*:

PRODUCT	RATE (L/ACRE)	WEEDS CONTROLLED
Single application	356-360 g / L Formulations 2.0 L / acre	Heavy infestations of the annual weeds listed above plus control of: Field bindweed, common milkweed, perennial sow-thistle, Canada thistle, and yellow nutsedge.
	480 g / L Formulations 1.51 L / acre	
	540 g / L Formulations 1.35 L / acre	

* This single application rate in Roundup Ready Corn only applies to Roundup WeatherMax and Roundup Transorb HC. Refer to individual glyphosate labels for the registration status of this rate usage in Roundup Ready Soybean.

Tank mixes in Roundup Ready Crops:
Mixes listed may not occur on all product labels. Refer to individual product labels for registered tank-mixes.

Canola: Lontrel at 112 mL / acre.
Soybean: Assure II at 154 mL / acre for volunteer RR corn control.
Corn: Atrazine at 0.63 to 0.84 L / acre of 480 to 500 g / L formulations or 0.34 to 0.45 kg / acre of 90% dry formulations for residual control of annual broadleaf weeds.

10. Tank Mixes:

Not all glyphosate products are registered for all tank mix options below. Refer to individual glyphosate labels for registered tank mixes, glyphosate rates and registered crop species.

	RATE PER ACRE
Preseeding cereals***:	2,4-D✧ (0.23 to 0.58L)*
	Express TNG + Agral 90 (4 g / acre + 0.35 v / v)
	Pardner (0.51 L)
	MCPA (0.2 to 0.4 L)*
	Buctril M (0.2 to 0.4 L)*
Preseeding corn & flax:	MCPA✧✧ (0.2 to 0.4 L)*
	Buctril M (0.2 to 0.4 L)*
Preseeding lentil & chickpea:	MCPA Amine✧✧ (0.2 to 0.28 L)*
Preseeding field pea:	MCPA Amine✧✧ (0.2 to 0.28 L)*
Preseeding canaryseed & seedling forage grasses✧✧✧:	Buctril M (0.2 to 0.4 L)*
Chem fallow:	2,4-D✧ (0.5 L)*
	Dicamba (0.12 L)*
	Express TNG (4 g)
	Pardner (0.51 L)
Canada thistle control in stubble or fallow:	Dicamba (0.51 L)**
Alfalfa control in spring / fall:	2,4-D (0.50 to 1.0 L)*

* Roundup Ready (RR) canola control: Tank mixes of 2,4-D at 0.23 to 0.34 L / acre, MCPA and Buctril M will control volunteer RR canola up to the 4 leaf stage and 2,4-D at 0.45 to 0.68 L / acre will give control up to the 6 leaf stage. Earlier application will result in more consistent control. Dicamba at 0.12 L / acre will not control RR canola.

** See recropping restrictions for Dicamba with fall applications.

*** 2,4-D tank-mixes in cereals are registered for winter wheat, wheat, barley, and rye; Pardner tank-mixes in cereals are registered on wheat, oats and barley; Buctril M and MCPA tank-mixes registered on cereals include wheat, barley oat and rye; Express Toss n Go tank-mixes in cereals include wheat, durum and barley.

✧ Rates based on 500 g / L formulations. All formulations are registered for tank mixes.

✧✧ Use only amine formulations of MCPA prior to corn lentil, chickpea and field peas

✧✧✧ Forage grasses include brome grass, crested wheatgrass, intermediate wheat grass, slender wheatgrass, tall wheatgrass, Russian wild rye, Timothy, Orchard grass, creeping red fescue, meadow fescue, meadow foxtail, tall fescue, meadow bromegrass, streambank wheatgrass and reed canary grass.

Note: The above mixes are those listed on the glyphosate labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. See the general guidelines for mixing pesticides for more information.

Application Information:

Water Volume: Do not use 'hard' or dirty water or weed control may be reduced.

Using clean water at 23-45 L per acre will provide acceptable weed control in most situations; use of the lower volume will improve control.

Refer to specific weed control situations or labels for more information on water volumes and adjuvants.

Pressure: 30 to 40 psi (200 to 275 kPa)

Nozzles: Flat fan

How it Works:

Refer to table 2 on page 29.

Effects of Growing Conditions:

Best results are achieved when temperatures are near 20°C and when weeds are actively growing. Frost which kills more than 40% of the above ground tissue will reduce control. Control will also be reduced if foliage is heavily covered with dust.

Restrictions:

Rainfall: Do not apply if rainfall is forecast for the time of application, as weed control may be reduced. Consult manufacturer for more information.

Grazing Interval: Only grain and forages treated with Touchdown iQ may be fed to livestock. All portions of forage and crops treated with other products may be fed to livestock.

Recropping Interval: No restrictions.

Aerial application: Glyfos, Factor 540, Roundup Transorb HC, Roundup Ultra, Roundup WeatherMax, Touchdown iQ, Vantage Plus Max, and Renegade HC are registered for aerial application for some preharvest treatments. Not all crop species listed in the pre-harvest section are registered for aerial application of these products.. Do not apply any other brands of glyphosate by air. Consult manufacturer for current aerial preharvest registration status.

Storage: May be stored below 0° C.

Equipment: Do not mix, store or apply this product in galvanized steel or unlined steel (except stainless steel) containers or spraytanks.

Environment: Glyphosate is very toxic to non-target plants.

Ground applications - maintain a 15 m buffer zone from the downwind edge of the spray boom to non-target areas to minimize drift damage.

Preharvest aerial applications - maintain a 25 m buffer zone from water and wetland areas, and a 55 m buffer from shelterbelts, woodlots and other cover on the edge of treated fields.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison (Factor 540, Renegade HC, Roundup Transorb HC, Roundup WeatherMax)

Warning Eye and Skin Irritant (Factor 540, Renegade HC, Roundup Transorb HC, Roundup WeatherMax)

Danger Eye and Skin Irritant (Maverick II, Roundup Ultra, Vantage Plus Max)

Caution Skin and Eye Irritant (all other products)

Gramoxone

Herbicide Group – 22
(Refer to page 27)

Company:
Syngenta (PCP#8661)

Formulation:
200 g / L paraquat. Container size - 5 L, 20 L.

Crops and Staging:
Stale seedbed - Non-selective weed control applied 3 days prior to crop emergence in beans, corn, potatoes, peas, soybeans.

Non-selective weed control applied as a directed spray between rows in row crops. Avoid contact with crop foliage.

Control of weed seedlings in established alfalfa and bird's-foot trefoil for hay - apply 5 days after first cut.

Control of weed seedlings in bird's-foot trefoil for seed - apply in spring when bird's-foot trefoil shoots are 3 to 6 inches (7.5 to 15 cm) long.

Non-selective weed control applied as a directed spray in and around shelterbelt trees or woodlot plantings. Avoid contact with foliage.

Pre or Post seeding burndown (prior to crop emergence) in barley, canary seed, canola, corn (field, sweet and pop), dry beans, field peas, flax (including low linolenic types), lentils, mustard, oats, potato, rye, soybean, sunflower, triticale, wheat.

Weeds and Staging:
Annual weed burn-off. Best control when weeds are less than 2 inches (5 cm) in height or diameter.

Cost (2006 suggested retail price):
$19.35 to $53.21 per acre.

Rates:
Pre or post seeding burndown: 0.8 to 1.6 L / acre

All other applications: If weeds are less than 2 inches (5 cm) in height, apply 1.1 L per acre (5 L treats 4.5 acres). If weeds are taller than 2 inches (5 cm), increase the rate of Gramoxone to 2.2 L per acre (5 L treats 2.2 acres).

Application Information:
Water Volumes:
Pre or post seeding burndown: at least 40 liters per acre.
All other applications: 135 to 500 L per acre. Use the higher water volumes within the range if weed growth is dense.

Good coverage is critical for good control.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

How it Works:
Refer to Table 2 on page 29.

Effects of Growing Conditions:
Best results on cloudy days or just prior to darkness.

Tank Mixes:
Corn: Aatrex, Dual II Magnum, Frontier and Primextra II Magnum*
Soybean: Dual II Magnum, Sencor, Lorox, Linuron, Sencor, Pursuit*
* Refer to product labels for time of application and restrictions.

Restrictions:
Rainfall: Within 1 hour will reduce weed control.

Grazing: Do not graze or harvest treated foliage. Regrowth from treated alfalfa or bird's-foot trefoil may be fed to livestock.

Recropping Interval: No restrictions

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environment: Maintain a buffer zone of 15 m between the downwind edge of the spray boom and non-target plants and 45 m for wetland areas. Do not spray when conditions are dead clam or when wind is gusty or blowing faster than 16 km / hr.

Tank Cleaning:
Refer to page 14.

Hazard Rating:

Danger - Poison (may be fatal if swallowed)


Danger - Corrosive to eyes

Re-entry Period: Do not re-enter treated fields for 24 hours following application. If necessary, workers may re-enter field after 4 hours if wearing protective clothing. See label for details.

Grazon

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences (PCP#26649)

Formulation:

65 g/L picloram + 240 g/L 2,4-D formulated as a solution.

Container size – 2 x 10 L.

Note: Available only through selected retail outlets.

Crops and Staging:

Permanent grass pasture and rangeland. Apply in spring or early summer.

Weeds, Rates and Staging:

Broadleaf weeds:

Apply at 1.5 L/acre:

Canada thistle	Common yarrow
Dandelion	

Apply at 2.8 L per acre:

Burdock	Goldenrod
Clovers (red, sweet)	Plantain
Common ragweed	Prickly lettuce
Dock	Vetch
Fleabane	Wild carrot

Woody plants:

Apply at 7.3 to 10.1 L per acre by ground and 10.1 to 14.2 L per acre by air:

Alder	Oak*✧
Aspen✧	Pine*
Birch	Poplar
Cedar (red cedar*)	Spruce*
Cherry✧	Sumac ✧
Locust✧	Willow✧
Maple*	

✧ Aerial application only

* High rate by air when species growing on heavy clay soils.

Use an approved drift control additive or system.

Cost (2006 suggested retail price):

$14.25 per L.

Application Information:

Water volume:
Ground application: 80 L per acre.
Aerial application: 60 L per acre.

Pressure: Use pressures that will give the lowest amount of drift while maintaining good pattern and coverage.

Nozzles: Use an approved drift control system that produces coarse droplets in a uniform pattern.

Drift of even small amounts of Grazon into sensitive plants or areas where sensitive crops may be grown can cause injury. Do not apply under conditions prone to drift (i.e. high winds and temperature inversions).

How it Works:

Refer to table 2 on page 29.

IMPORTANT: Picloram is a very persistent and water-soluble herbicide. Treated soil should not be moved from the treated area. Do not apply to soils that are permeable, have sinkholes, or lie over limestone bedrock. Do not apply to soils whose surfaces are composed of fractured rock or unconsolidated gravel. Application to these sites may allow the movement of herbicide to underlying water sources or aquifers. When applying Grazon over sandy soils ensure that aquifers are not within 1.8 m of the soil surface. If shallow aquifers are present, do not apply Grazon. Grazon must not be applied on range and pasture acres that are irrigated. Do no compost or mulch clippings or manure from grass treated with Grazon unless being reapplied to the treated area.

Effects of Growing Conditions:

Nothing listed on label.

Tank Mixes:

None registered.

Restrictions:

Rainfall: Do not apply if rainfall is forecast.

Grazing: Do not allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. Do not harvest forage or cut hay within 30 days of application. See restrictions in “How it Works” section above.

Recropping: Legumes may not be established in a pasture for several years after treatment. If legumes are essential in a pasture, do not use Grazon. Do not break up treated pasture and plant to sensitive broadleaf crops for at least 5 years after application of Grazon.

Storage: Store product in original containers in a secure, dry, cool area. Do not freeze.

Environment: This product is moderately toxic to fish. Apply this product well back from any water bodies to avoid contamination. Heavy rains can move this product from its application site down slope toward sensitive areas. Do not load or mix near wells, dugouts or other water bodies. Contact the provincial environment department for permits to apply near water.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

May cause skin and eye irritation

Harmony K†

Herbicide Group – 1, 2, and 4
(Refer to page 27)

Harmony K is equivalent to Harmony Total† (page 140) tank mixed with Banvel II (page 92). For other detailed information on the component products see the product pages listed above and Refine Extra TNG (page 183) and Horizon (page 141).

Company:

E. I. duPont Canada

Formulation:

Harmony K package contains the following components:

Refine Extra (PCP#22575)†: 50% thifensulfuron methyl + 25% tribenuron methyl; formulated as a water dispersible granule.
Container size: 4 x 80 g water soluble pouches (320 g total).

Horizon WO (PCP#25477): 240g / L clodinafop-propargyl formulated as an emulsifiable concentrate.
Container size: 1 x 3.68 L

Banvel II (PCP#23957): 480 g / L dicamba diglycolamine salt, formulated as a solution.
Container size: 1.8 L

Score Adjuvant (PCP#25476): Container size -2 x 6.4 L

† NOTE: Harmony Total and Refine Extra are no longer manufactured, but some supplies may still remain in the distribution system. Harmony K will eventually switch to use Refine SG in its packaging in place of Refine Extra TNG.

Crops and Staging:

Spring wheat (NOT including durum) up to the emergence of the 4th tiller.

Weeds and Staging:

Harmony K controls the same weeds as Harmony Total with the addition of Group 2 resistant kochia.

Cost (2006 suggested retail price):

Harmony K: $24.28 per acre

Rates:

Refine Extra - 8 g / acre

Horizon WO - 93 mL / acre

Banvel II – 44.5 mL / acre

Score adjuvant - 0.8 L per 100 L of spray solution

One package treats 40 acres (16 ha)

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

See Harmony Total, Horizon and Refine Extra TNG pages for additional information and precautions.

Harmony Total* / Harmony SG

Herbicide Group – 1, 2
(Refer to page 27)

This product is a prepackaged tank mix of Refine Extra (Harmony Total) or Refine SG (Harmony SG) (page 183) and Horizon (page 141). Information listed is restricted to Crop, Weeds, Rates, Cost and Tank mixes. For other detailed information on the component products see the product pages listed above.

Company:

E. I. duPont Canada

Formulation:

Both Harmony Total* & Harmony SG packages contain the following components:

Horizon WO (PCP#25477): 240g / L clodinafop-propargyl formulated as an emulsifiable concentrate.
Container size: 1 x 3.68 L

Score Adjuvant (PCP#25476): Container size: 2 x 6.4 L

Harmony Total* package contains the following component:

Refine Extra (PCP#22575): 50% thifensulfuron methyl + 25% tribenuron methyl; formulated as a water dispersible granule.
Container size: 4 x 80 g water soluble pouches (320 g total).

Harmony SG package contains the following component:

Refine SG (PCP#28285): 33.35% thifensulfuron methyl + 16.65% tribenuron methyl; formulated as a water soluble granule.
Container size: 486 g bottle.

* NOTE: Harmony Total is no longer manufactured, but some supplies may still remain in the distribution system. Harmony Total may be removed from future versions of this publication.

Crops and Staging:

Spring wheat (including durum) up to the emergence of the 4th tiller.

Weeds and Staging:

Grass Weeds:
Wild oat - 1 to 6 leaves up to the emergence of the 4th tiller.
Green foxtail - 1 to 5 leaves up to the emergence of the 3rd tiller.

Broadleaf Weeds:
Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.

Controlled:

- Ball mustard
- Chickweed (1 to 6 leaf)
- Common groundsel
- Corn spurry
- Cow cockle
- Flixweed
- Green smartweed
- Hemp-nettle
- Kochia (Group 2 resistant biotypes with Banvel II tankmix only)
- Lady's-thumb
- Lamb's-quarters
- Narrow-leaved hawk's-beard
- Redroot pigweed
- Russian thistle
- Shepherd's-purse
- Stinkweed
- Tartary buckwheat
- Volunteer canola (CLEARFIELD canola only with MCPA Ester tank mix)
- Volunteer sunflowers
- Wild buckwheat***
- Wild mustard

*** Wild buckwheat controlled at the 3 leaf stage for Harmony Total and at the 5 leaf stage for Harmony SG.

Suppressed:
Cleavers - 1 to 3 whorls
Stork's-bill, round-leaved mallow - 2 to 6 leaves
Canada thistle, perennial sow-thistle - under 6" (15 cm) tall, prior to budding
Scentless chamomile
Toadflax - less than 6" (15 cm) tall

For optimum control apply before the annual grasses tiller. Harmony Total will also control or suppress the broadleaf weeds listed for Refine Extra alone at 8 g / acre.

Cost (2006 suggested retail price):

Harmony Total: $23.80 per acre.
Harmony SG: $24.28 per acre

Rates:

Refine Extra - 8 g / acre (Harmony Total only)
Refine SG – 12 g / acre (Harmony SG only)
Horizon WO - 93 mL / acre
Score adjuvant - 0.8 L per 100 L of spray solution
One case treats 40 acres (16 ha)

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kpa).

Nozzles: Flat fan nozzles with 50 mesh line strainers and screens.

Tank Mixes:

Do not tank mix with substances that contain boron or that release chlorine.

Herbicides:
MCPA Ester (0.38 to 0.45 L / acre of 500 g / L formulation).
Banvel II (44.5 mL / acre). Not for use in durum.

Horizon

Herbicide Group – 1
(Refer to page 27)

Company:

Syngenta

Formulation:

Horizon (PCP#24076): 240 g / L clodinafop-propargyl formulated as an emulsifiable concentrate.
Container size – 3.68 L.

Score Adjuvant (PCP#20475): 2 x 6.4 L.

Crops and Staging:

Spring wheat (including durum) - prior to the emergence of the 4th tiller.

When tank mixing, check broadleaf product description for additional restrictions.

Weeds, Rates and Staging:

Apply at 95 mL per acre (40 acres per case) for:

WEED	STAGE
Barnyard grass	1 to 5 leaf prior to tillering
Green and yellow foxtail	1 to 5 leaf stage, prior to emergence of 3rd tiller
Volunteer canaryseed, wild oats	1 to 6 leaf, maximum 3 tillers
Volunteer oats	3 to 6 leaf, maximum 3 tillers

Add Score adjuvant at a rate of 0.8 L per 100 L spray solution.

Apply at 115 mL per acre (32 acres per case) to control the above weeds plus

WEED	STAGE
Persian darnel	1 to 5 leaf prior to tillering

Add Score adjuvant at a rate of 1 L per 100 L spray solution.

Apply at the 2 to 3 leaf stage for optimum control.

Optimum weed control and yield response occurs when weeds are controlled before tillering.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$18.59 to $23.24 per acre.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 to 45 psi (275 to 310 kPa).

Nozzles: 80° or 110° flat fan stainless steel nozzles tilted forward at an angle of 45°.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

For optimum results, apply to actively growing weeds. Do not apply to crops or weeds that are stressed by hot or cool conditions, frost, drought, low fertility, water-saturated soil, disease or insect damage as crop injury and poor weed control may result.

Tank Mixes:

Mixes provide control of wild oat, green foxtail, and weeds/insects controlled by the tank mix partner unless otherwise noted.

Herbicides:

In spring wheat (including durum except where indicated):
2,4-D amine (0.34 to 0.45 L/acre)
Ally (3 g/acre)
Attain (40 acres/case)
Bromoxynil+MCPA (Buctril M*** or Mextrol only) (label rates)
Curtail M (0.81 L/acre)
Dichlorprop + 2,4-D (0.71 L/acre)**
DyVel (0.50 L/acre)
Frontline (40 acre per case)†
Lontrel (0.17 to 0.34 L/acre)
Lontrel (0.11 to 0.17 L/acre) + MCPA ester (0.45 L/acre)
Lontrel (85 mL/acre) + Refine Extra (8 g/acre)
MCPA amine or ester (0.34 to 0.45 L/acre)
MCPA Sodium Salt (0.48 to 1.09 L/acre)*
Mecoprop-P (2.2 to 2.8 L/acre)
Pardner (0.40 L/acre)
Prestige (20 acres/case)
Refine Extra (8 g/acre)
Target (0.4 to 0.6 L/acre)**
Thumper (0.40 L/acre)
Trophy (20 acres per case)
Unity (40 acres/case)

* Rate above 0.81 L/acre may cause crop injury.

** Barnyard grass also controlled

*** Barnyard grass and Persian darnel also controlled

† High rate of Horizon required for wild oat and green foxtail control. May use and addition 57 mL/acre of MCPA Ester for improved control of specific weeds. See Frontline page for details.

Refer to the broadleaf herbicide label for crop staging, and other information. When tank mixing, always add the broadleaf herbicide first, followed by Horizon, with the Score adjuvant added last. Reductions in green foxtail and wild oat control may be observed when tank mixed with 2,4-D amine and MCPA amine.

Fertilizers: None registered.

Insecticides:
Decis 5F (32 to 48 mL/acre).
Matador (25 to 33 mL/acre).

Fungicides: Tilt (0.2 L/acre)

Note: The above mixes are those listed on the Horizon label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall within 30 minutes may reduce control.

Grazing: Do not graze or harvest treated crops for forage within 3 days of application.

Preharvest: Leave at least 60 days from application to harvest.

Recropping: No restrictions.

Storage: May be frozen.

Aerial Application: Do not apply by air.

Environment: Do not apply within 15 m of rivers, lakes, ponds, wetlands, sloughs, irrigation water, vegetated ditch banks, or water used for livestock or domestic purposes.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Warning Eye and Skin Irritant

Horizon BTM

Herbicide Group – 1, 4, 6
(Refer to page 27)

This product is a prepackaged tank mix of Horizon (page 141) and Mextrol 450 (page 84). Information listed is restricted to Crop, Weeds, Rates and Cost. For other detailed information on the component products see the product pages listed above.

Company:

Syngenta

Formulation:

The Horizon BTM package has three components:

Horizon 240 EC (PCP#25477): 240 g / L clodinafop-propargyl formulated as an emulsifiable concentrate. Container size -1.84 L

Mextrol 450 (PCP#26999): 225 g / L bromoxynil and 225 g / L MCPA ester formulated as an emulsifiable concentrate. Container size -10.2 L

Score Adjuvant (PCP#25476): Container size: 6.4 L
Each case treats 20 acres.

Crops and Staging:

Spring wheat (including durum) from the 2 leaf stage up to the emergence of 4th tiller.

Weeds and Staging:

Grass Weeds:

Wild oat	1 to 6 leaves to the emergence of the 4th tiller.
Green foxtail	1 to 5 leaves to the emergence of the 3rd tiller.

Broadleaf Weeds:

Weeds controlled up to 4 leaf stage:

American nightshade	Night-flowering catchfly
Bluebur	Pale smartweed
Ball mustard	Redroot pigweed
Cocklebur	Russian thistle**
Cow cockle	Scentless chamomile***
Flixweed	Shepherd's-purse
Green smartweed	Volunteer canola
Kochia**	Volunteer sunflower
Lady's-thumb	

** Control before plants are 2 inches tall.
*** Spring seedlings only.

Weeds controlled up to 8 leaf stage:

Common groundsel	Tartary buckwheat
Common ragweed	Wild buckwheat
Lamb's-quarters	Wild mustard
Stinkweed	Wormseed mustard
Tame buckwheat	

Weeds with top growth controlled:

Canada thistle	Perennial sow-thistle

Cost (2006 suggested retail price):

$24.71 per acre.

Rates:

Mextrol 450: 0.51 L / acre
Horizon: 95 mL / acre
Horizon BTM adjuvant: 0.32 L / acre

One case treats 20 acres.

Add Mextrol 450 first, followed by Horizon 240 EC with the Horizon BTM adjuvant added last.

Application Information:

Water Volume: 40 L per acre

Kerb 50-WSP

Herbicide Group – 15
(Refer to page 27)

Company:

Dow AgroSciences (PCP#25595)

Formulation:

50% propyzamide formulated as a wettable powder. Container size - 1.36 kg (3 x 454 g water soluble pouches).

Crops and Staging:

Apply to the following established crops between October 1 and freeze-up or very early spring*:

Seedling and established alfalfa, bird's-foot trefoil, and established pastures**.

* Seed alfalfa only.

** Severe stand thinning may occur to pastures consisting primarily of crested wheatgrass, meadow fescue and timothy. Some thinning (10 to 15%) may occur with tall fescue and creeping red fescue.

Weeds, Rates and Staging:

Apply in late fall or very early spring (seed alfalfa only) prior to the emergence of weeds.

Established grass or grass/legume pastures for control of foxtail barley:
Brown, dark brown or gray wooded soils - 0.36 kg / acre.
Black soils - 0.45 kg / acre.

Alfalfa and bird's foot trefoil:
Annual grasses, volunteer cereals, wild oat - 0.71 kg / acre.
Quackgrass, orchardgrass, timothy, chickweed - 0.91 to 1.32 kg / acre*.
Dodder control (fall application only) - 1.3 kg / acre. Note that complete control may not be achieved.

* Maximum 0.91 kg per acre with spring application. Low temperatures and adequate moisture following application are needed for efficacy.

Caution: Do not use on soils with more than 6% organic matter. Do not apply to soils prone to flooding. Do not apply to pastures that contain high proportions of timothy, crested wheat grass or meadow fescue. Consult the manufacturer for other forage grass species sensitivities to Kerb 50-WSP.

Cost (2006 suggested retail price):

$83.69 per kg.

Application Information:

Water Volume: 120 to 200 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Dry soil conditions at time of weed emergence may result in reduced control. Approximately 3 inches of total precipitation is required for adequate activation. Best results when soil temperatures are low but above freezing.

Tank Mixes:

None registered.

Restrictions:

Rainfall: Surface applications are most effective if followed by 0.5 to 1 inch (1.25 to 2.5 cm) of rain within 2 days of application.

Grazing: Do not graze or harvest for livestock feed within 90 days of the 1.32 kg / acre rate and 60 days of application for lower rates.

Recropping: Do not replant to crops within 1 year of treatment.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. Do not freeze

Environment: Do not contaminate domestic or natural water sources or wetlands.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Laddok

Herbicide Groups – 5,6
(Refer to page 27)

Company:
BASF Canada (PCP#16641)

Formulation:
200 g/L bentazon and 200 g/L atrazine formulated as a solution.
Container size - 10 L.

Crops and Staging:
Corn (grain, silage, sweet, and seed) at the 1 to 5 leaf stage. Seed corn producers should consult their seed corn company regarding the tolerance of seed production lines to Laddok and oil concentrates.

Weeds, Staging and Rates:
Add Assist at 1.0 L per 100 L of spray solution.

	1.21 L/ACRE		1.62 L/ACRE	
ANNUAL WEEDS	inches	(cm)	inches	(cm)
Bird rape	2 - 4	(5.0 - 10.0)		
Black nightshade			0.2 - 0.8	(0.5 - 2.0)
Buttercup			2 - 4	(5 - 10)
Cocklebur	3 - 7	(7.5 - 17.5)	7 - 12	(17.5 - 30.0)
Common chickweed			Apply 1 to 3 weeks after emergence	
Common groundsel			2 - 4	(5 - 10)
Common ragweed	1 - 1.5	(2.5 - 4.0)	1.5 - 3	(4.0 - 7.5)
Corn spurry			1 - 4	(2.5 -10.0)
Giant ragweed			2 - 6	(5 - 15)
Hairy galinsoga			2 - 3	(5.0 - 7.5)
Lady's-thumb (smartweed)	1 - 3	(2.5 - 7.5)	3 - 8	(7.5 - 20.0)
Lamb's-quarters	1 - 2	(2.5 - 5.0)	2 - 4	(5 - 10)
Purslane			1 - 2	(2.5 - 5.0)
Redroot pigweed	0.7 - 1.2	(1.5 - 3.0)	1.2 - 1.5	(3 - 4)
Russian thistle			1 - 3	(2.5 - 7.5)
Venice mallow	1 - 2	(2.5 - 5.0)	2 - 4	(5 - 10)
Wild mustard	1 - 5	(2.5 - 12.5)	5 - 10	(12.5 - 25.0)
PERENNIAL WEEDS	Rate: 1.21 - 1.62 L / acre			
Yellow nutsedge	4 - 6	(10 - 15)	(repeat 7 -10 days if necessary)	

Cost (2006 suggested retail price):

$16.09 to $21.55 per acre.

Application Information:

Water Volume: 80 to 160 L per acre. The higher recommended water volumes and pressures should be used for dense weed infestations or for weeds approaching the upper limit of their recommended stage for treatment.

Pressure: 40 to 45 psi (275 to 300 kPa).

Nozzles: Flat fan nozzles capable of delivering high water volumes.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Crop injury may occur if applications are made when crop is under stress because of prolonged cold weather, poor fertility or other factors; or when corn is wet and succulent from recent rainfall.

Best weed control is under warm, humid conditions.

Tank Mixes:

None registered.

Restrictions:

Rainfall: Within 6 to 8 hours of application will reduce control.

Grazing: Do not graze the treated crop or cut for hay prior to crop maturity.

Preharvest Interval: Do not harvest within 60 days of application to field corn

Recropping: No restrictions the year following treatment when label rates for annual weeds have been used. Use of the double application for yellow nutsedge control may cause injury to rotational crops because of carryover of the Atrazine component of the product. Under particularly dry soil conditions, there may be greater carryover of the atrazine component of Laddok that could damage a number of different special crops. Refer to the "Atrazine" product description for information.

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environment: Avoid conditions that will risk drift to non target plant, water sources or wetlands. A buffer zone of 10 metres is required when spraying next to sensitive aquatic areas such as sloughs, ponds, potholes, lakes, rivers, streams and wetlands. A buffer zone of 30 metres is required when mixing or loading next to the above mentioned aquatic areas.

Tank Cleaning:

The manufacturer does not provide information on tank cleaning.

Refer to Basagran and Atrazine recommendations and page 14.

Hazard Rating:


Caution Poison

Liberty

Herbicide Group – 10
(Refer to page 27)

Company:

Bayer CropScience (PCP#26694)

Formulation:

150 g/L glufosinate ammonium formulated as a solution. Container sizes - 13.5 L, 108 L.

Crops and Staging:

Liberty Link Canola - cotyledon to early bolting stage. Temporary crop discolouration (bronzing) may be observed after application.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

For Desiccation use only:
Alfalfa (seed production only) - 50 to 75% pod turn (brown)
Lentils* - 40 to 60% pod turn (yellow to brown)
Potatoes* - 14 to 21 days prior to harvest.
*Not for crops grown for seed production.

Weeds, Rates and Staging:

WEED	WEED STAGE (from emergence to stage)	RATE (L/ACRE)	ACRES PER 13.5 L
Cow cockle	4 leaf	0.54	25
Green foxtail	6 leaf (max. 3 tillers)		
Barnyard grass, volunteer canola✧✧	4 leaf	0.81	16.6
Wild mustard	5 leaf		
Lamb's-quarters, smartweed (lady's-thumb)	6 leaf		
Stinkweed	8 leaf		
Volunteer flax	2.5 inches (6 cm)		
Russian thistle	3 inches (8 cm)		
Wild buckwheat	3 leaf	1.1	12.4
Redroot pigweed, round-leaved mallow, quackgrass*	4 leaf		
Light to moderate infestations✧ of volunteer wheat, volunteer barley*	4 leaf (max. 2 tillers)		
Hemp-nettle (1 to 3 leaf pairs), shepherd's purse	6 leaf		
Common chickweed (max. 4 leaf pairs), Perennial sow-thistle	8 leaf		
Kochia	3 inches (8 cm)		
Canada thistle*, scentless chamomile	4 inches (10 cm)		
Cleavers	2 whorls (nodes)	1.35	10
Stork's-bill and heavy populations of wild buckwheat	3 leaf		
Quackgrass (light to moderate** or heavy infestations*)✧, volunteer wheat, volunteer barley*, wild oat	4 leaf (max. 2 tillers except quackgrass)		
Hemp-nettle	8 leaf (1 to 4 leaf pairs)		
Dandelion rosettes	6 in. (15 cm) across		
Flixweed, Canada thistle*	4 inches (10 cm)		
Quackgrass***	4 leaf	1.6	8.3
Canada thistle**	4 inches (10 cm)		

* Temporary top growth control. Plants may return from surviving growing points.
** Extended top growth control.
*** Season long control.
✧ The company does not provide guidelines for weed densities. When in doubt as to the infestation level, use the high rate or contact the manufacturer.
✧✧ NOT including Liberty Link varieties.

A second application can be made to fields that were treated initially with up to 1.35 L / acre. Apply Liberty at a rate of 0.81 to 1.35 L / acre in the second application.

Desiccation Rates:

Alfalfa (seed production only) - 1.09 L per acre.
Lentil* - 0.81 to 1.09 L per acre.
Potato* - 1.21 L per acre.
* Not for crops grown for seed production.

Cost (2006 suggested retail price):

$14.04 per L.

Application Information:

Water Volume:
Ground applications: 45 L per acre.
Aerial applications:
In Liberty Link canola use 22 L per acre.
For desiccation, 13 to 22 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles:
Ground Application: 80° or 110° stainless steel flat fan nozzles tilted forward at an angle of 45°.
Aerial applications: Do not use raindrop nozzles. Use a combination of nozzles and pressure to provide a coarse droplet size distribution (mean diameter of 350 microns).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Liberty activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought, and low humidity conditions slow weed growth. Applications made under these stressed conditions may result in reduced weed control.

Tank Mixes:

Herbicides:
For enhanced control of wild oat and volunteer barley, in Liberty Link canola Liberty at 1.1 -1.35 L/acre mixed with:

Clethodim (25.5 mL / acre).

Fusion (40 acres per case).

Consult Liberty label for exact weed control options. For Clethodim tank mix add Amigo to the tank first at 0.5 L per 100 L spray solution followed by Liberty and then tank mix partner. Consult label for specific mixing instructions.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Liberty label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 4 hours may reduce control.

Grazing: Do not graze the treated crop or cut for feed.

Preharvest Interval: Do not harvest desiccated potato or lentil crops within 9 days of treatment.

Recropping: No restrictions.

Aerial Application: May be applied by air.

Storage: Do not freeze.

Environment: Do not apply within 15 m of environmentally sensitive areas using ground equipment or within 30 m of environmentally sensitive areas when applying by air. Do not apply when dead calm or when winds exceed 16 km / hr when using unprotected booms or applying by air, or exceeding 25 km / hr when using shrouded booms.

Tank Cleaning:

Refer to tank cleaning section on page 14.

Hazard Rating:


Warning Poison

Skin and Eye Irritant

Liberty 200 SN

Herbicide Group – 10
(Refer to page 27)

Company:

Bayer CropScience (PCP#25337)

Formulation:

200 g/L of glufosinate ammonium formulated as a solution.

Container sizes - 10 L

Crops and Staging:

For use on LIBERTY 200 SN tolerant Corn only. Apply from 1-8 leaf stage of the crop, refer to product label for appropriate method of determining crop leaf stage.

Weeds Rates and Staging:

Weeds controlled with 0.61 L per acre rate

WEED	WEED STAGE (from emergence to stage)
Green foxtail	5 leaf
Proso millet	5 leaf
Chickweed	8 leaf
Cocklebur	4 leaf
Ragweed	5 leaf
Redroot pigweed	6 leaf
Shepherd's-purse	6 leaf

Weeds controlled with 0.81 L per acre rate

WEED	WEED STAGE (from emergence to stage)
Barnyard grass	5 leaf
Wild oat	4 leaf
Yellow foxtail	4 leaf

WEED 0.81 L per acre rate continued	WEED STAGE (from emergence to stage)
Eastern black nightshade	5 leaf
Lady's thumb	6 leaf
Lamb's quarters	6 leaf
Perennial sowthistle	4 leaf
Ragweed	7 leaf
Stinkweed	8 leaf
Wild buckwheat	4 leaf
Wild mustard	4 leaf
Wormseed mustard	6 leaf
Field bindweed*	6 leaf
Canada thistle*	6 leaf

* season long suppression.

Weeds controlled with 1.0 L per acre rate

WEED	WEED STAGE (from emergence to stage)
Quackgrass**	4 leaf

** season long suppression, apply with ammonium sulphate, 2.4 L/acre (49% solution) or 1.2 kg/acre (99%).

Second Application:
A second application of LIBERTY 200SN may be made to fields treated initially with up to 1 L/acre, if weeds are present. Apply when new weed growth is in the correct leaf staging, and before maximum allowable leaf staging for crop. Do not apply more than 1.8 L/acre LIBERTY 200SN to a crop in a single season.

Split Application Program:
For season long control of the above listed weeds a split application of Liberty 200SN may be employed. The first application must be a minimum of 0.81 L/acre LIBERTY 200SN made at the correct weed staging. For the second application of LIBERTY 200SN a 0.51 L/acre rate may be used. The second application timing must be made as soon as the second flush of weeds occurs and before the maximum leaf stage for the crop.

Cost: (2006 suggested retail price)

$16.71 to $27.40 per acre.

Application Information:

Water Volume: A minimum of 45 L per acre.

Pressure: 25 to 40 psi (175 to 275 kPa).

Speed: 6 to 10 km/h.

Nozzles: 80° or 110° flat fan nozzles tilted forward at an angle of 45°.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Liberty 200SN activity is influenced by environmental conditions. Cool temperatures (less than 10°C), drought and low humidity conditions slow weed growth. Applications made under these stress conditions may result in reduced weed control.

Weed control may also be reduced when heavy dew, fog, or mist are present at the time of application.

Tank Mixes:

None registered.

Restrictions:

For use on glufosinate-ammonium tolerant field corn only.

Rainfall: Rainfall within 4 hours of application may reduce weed control.

Grazing: Do not graze treated fields within 20 days of application.

Pre-harvest Interval: Do not apply within 86 days of harvesting corn grain.

Recropping: No recropping restrictions the year after treatment.

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environmental: Do not contaminate water supplies, ponds, lakes, streams, and irrigation ditches by direct applications, spray drift, or when cleaning and rinsing spray equipment or containers. Leave a 15 meter buffer between the edge of the treated field and adjacent crops not tolerant to LIBERTY 200SN or environmentally sensitive areas (e.g. wetlands, ponds, rivers, or other open bodies of water, shelter belts or wildlife habitat).

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Warning Eye and Skin Irritant

Linuron

Herbicide Group – 7
(Refer to page 27)

Company/Products:

E. I. duPont Canada (Lorox L – PCP#16279)

United Agri Products (Linuron 400* – PCP#15544)

The following recommendations are a blend of recommendations of all linuron products. Consult the individual product labels for specific recommendations.

Formulations:

Linuron 400: 400 g/L linuron formulated as a flowable. Container size - 10 L.

Lorox L: 480 g/L linuron formulated as a flowable. Container size - 10 L.

*Linuron 400 may be in short supply in the distribution system for 2006 but is expected to be produced in the future.

Crops, Rates and Stages:

Post-emergent applications only:

CROP	STAGE	LINURON 400 (L/acre)	LOROX L (L/acre)
Spring wheat (including durum), oats and barley*	2 to 4 leaf stage	0.20 -0.26	0.17 -0.22
Field corn (post-emergent** directed spray, do not spray over top of corn)	Apply when corn is at least 15 inches (38 cm) high (highest leaf on free standing plant)	1.16 -2.18	0.97 -1.82
Caraway, coriander	Apply when in the 2 to 4 leaf stage	—	0.50 to 0.67
Dill†	Apply when dill has at least 2 full leaves developed	—	0.77 to 1.9
Shelterbelts (caragana, green ash, Siberian and American elm, Manitoba maple, poplar, willow, white spruce, Colorado spruce, Scots pine)	Apply as an overall spray to dormant stock or as a directed spray if buds have broken.	2.18	1.82

* Only when tank mixed with MCPA amine at 0.34 to 0.45 L / acre (500 formulation) or 0.4 to 0.57 L / acre MCPA K (400 formulation).

** Use lower rate when weeds do not exceed 2 inches (5 cm) and higher rate for weeds up to 8 inches (20 cm) in height, preferably before they are 5 inches (13 cm) high. Requires the addition of a mineral oil surfactant blend at 1 to 2 L per 100 L or spray solution or spray oil at 1 to 2 L per 10 L of spray solution. See oil labels for directions. DO NOT apply if linuron has been applied pre-emergent.

† A split pre-emergent / post emergent application of linuron may be made in dill. See below for more information.

Pre-emergent surface (not incorporated) applications for use on loam to clay soils only:

	LINURON 400 (L/acre)		LOROX L (L/acre)	
Soil organic matter	less than 2%	from 2 -5%	less than 2%	from 2 -5%
Field corn	1.09*	1.58	0.91*	1.31*
Soybeans	1.09 -1.58	1.58 -2.18	0.91 -1.31	1.31 -1.82
Sweet white lupins	1.01	1.50	0.85	1.25
Potatoes	1.11 -1.72	1.72 -2.22	0.91	1.82
Dill†	—	—	0.53 – 0.77	0.77 – 1.0

* Must be tank mixed. Refer to specific labels for registered tankmix partners.

† A split pre-emergent / post emergent application of linuron may be made in dill. See below for more information.

If used on sandy soils, severe crop injury may result.
Seed the crop at least 2 inches (5 cm) deep. Make only one application per year to field crops.
When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

†Split applications:
This product may also be applied to dill as a split pre / post – emergent application. A pre-emergent surface application of up to 0.77 L / acre, followed by a second post-emergent application, no sooner than two weeks after the first, of up to 1.0 L / acre. Minimum staging for post-emergent applications given above still applies.

Banded Applications:
This product may also be applied in a narrow band directly over the row in wide rowed crops if another method is to be used for weed control in between the rows. For band treatment, use proportionately less; for example, for 10 inch band on 30 inch row, use 1 / 3 of the broadcast rate.

Weeds and Staging:

Post-Emergence

When tank mixed with MCPA amine in cereals, the following weeds are controlled:

Chickweed
Corn spurry
Cow cockle
Flixweed
Green foxtail (suppression possible)
Green smartweed
Hemp-nettle
Lady's-thumb
Lamb's-quarters
Ragweed (common, giant)
Redroot pigweed
Shepherd's-purse
Stinkweed
Stork's-bill
Tartary buckwheat
Wild buckwheat

Apply when annual broadleaf weeds are in the 2 to 4 leaf stage and when green foxtail is in the 1 to 3 leaf stage.

In shelterbelts, apply when weeds are less than 4 inches (10 cm) tall.

Pre-emergent surface treatments and Post-emergent applications in corn and shelterbelts:
Sufficient moisture (1 to 2 inches or 3 to 5 cm) in the form of rainfall or irrigation is necessary within 7 to 10 days of a pre-emergence application or poor weed control will result.

Barnyard grass*
Common chickweed
Common groundsel■
Corn spurry■
Crabgrass*
Dandelion (seedlings only)■
Foxtail (green and yellow)*
Goosefoot
Knotweed
Kochia■
Lamb's-quarters
Pigweed (prostrate■, redroot)
Plantain (seedlings only)■
Purslane
Ragweed (common)
Shepherd's-purse
Smartweed (annual)
Sow-thistle (annual, perennial■ seedlings only)
Stinkweed°
Wild buckwheat
Wild radish■
Witchgrass
Wormseed mustard

* partial control
■ Not registered with Lorox products.
° Not registered with Linuron 400.

Costs (2006 suggested retail prices):

Lorox L - $25.27 per L
Linuron 400 - $26.50 per L

Application Information:

Water Volume:
Post-emergent: Cereals, coriander & caraway - 40 L per acre.
Field Corn directed spray – 69 to 138 L per acre.
Dill – 89 to 178 L per acre
Pre-emergent surface: 81 to 162 L per acre.
Shelterbelts: 90 to 180 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Stainless steel, flat fan nozzles with 50-mesh (or coarser) line strainers and screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

In post-emergent applications the best weed control occurs when temperatures are moderate, when relative humidity is high and when soil moisture is adequate. Injury to cereals (crop lightening) will occur when the crop is under stress because of drought or disease. This injury is worse when the product is applied at advanced leaf stages. In pre-emergent surface treatments, rainfall or irrigation (1 to 2 inches or 3 to 5 cm) is required to move linuron into the root zone of germinating seeds. Insufficient moisture will result in poor weed control. Drought conditions after application will result in little to no weed control. If rainfall does not occur within 7 to 10 days of application and prior to crop emergence, a shallow rotary hoeing (0.75 to 1.5 inches / 2 to 4 cm) should be made to mix the top layer of soil to help activation. Avoid covering treated ground with un-treated soil. If unusually heavy rain follows application, severe crop injury may result from herbicide in the root zone of the crop. Do not use on sandy soils or severe crop injury will result.

Tank Mixes:

Herbicides:
In Cereals: For post-emergent applications in cereals, linuron must be tank mixed with MCPA amine or MCPA K. Do not tank mix with other herbicides.
In Corn: Atrazine, Dual II Magnum and Primextra II Magnum. Not all linuron products have the same tank mix options, refer to specific labels.

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the linuron labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Pre-emergent applications require rainfall for activation. Contact manufacturer for more information.

Grazing: Do not graze treated crops or cut for feed prior to crop maturity.

Preharvest Interval:
Sweet Corn: Do not harvest within 50 days of treatment.
Field Corn: Do not harvest within 60 days of treatment or until after tassle emergence.
Caraway, Coriander & Dill: Do not harvest within 60 days of treatment.

Recropping: If the intended crop fails, fields treated with Pre-emergent surface applications of linuron, may be seeded back to corn, soybeans, sweet white lupins, or potatoes. Till the soil thoroughly before reseeding. No restrictions 1 year after treatment.

Aerial Application: Do not apply by air.

Storage: Do not store liquid Linuron formulations at temperatures below 5°C. Lorox L may be frozen

Tank Cleaning:

Refer to page 14.

Lontrel

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences (PCP#23545)

Formulation:

360 g / L clopyralid formulated as a solution.

Container size - 4.45 L.

Crops Rates and Staging:

Applications of 0.17 to 0.23 L/acre (26.2 to 19.3 acres/jug): Barley, spring wheat (NOT including durum), oat - 3 to flag leaf emergence stage.

Applications of 0.23 to 0.34 L/acre (19.3 to 13.1 acres/jug): Flax, solin (low linolenic acid flax) - 2 to 4 inches (5 to 10 cm) in height.

Applications of 0.17 to 0.34 L/acre (26.2 to 13.1 acres/jug):
Canola - 2 to 6 leaf stage.
Seedling forage grasses* - 2 to 4 leaf stage.
Established grasses* - at the shot blade stage, or in the fall after harvest or in early spring.
Seedling and established grasses* for forage and seed production include:

Altai wild ryegrass	Reed canarygrass
Creeping red fescue	Slender wheatgrass
Crested wheatgrass	Smooth bromegrass
Intermediate wheatgrass	Streambank wheatgrass
Kentucky bluegrass	Tall fescue
Meadow fescue	Tall wheatgrass (for forage only)
Meadow foxtail	Timothy
Orchardgrass	Russian wild ryegrass

Applications of 0.34 L per acre (13.1 acres per jug):
Summerfallow – Stage according to weeds.
Shelterbelts* containing villosa lilac, acute willow, Colorado spruce, white spruce, buffaloberry and chokecherry.*

*NOTE: Since this use is registered under User Requested Minor Use Label Expansion program, the manufacturer assumes no responsibility for herbicide performance. Users of this product for these uses do so at their own risk.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

The following weeds will be controlled from 0.23 to 0.34 L per acre when young and actively growing:

Alsike clover	Scentless chamomile
Common groundsel	Wild buckwheat
Perennial sow-thistle (top growth only)	Volunteer alfalfa - 2 to 20 inches (5 to 50 cm) in height.

Canada thistle - after all thistles have emerged and when the majority are in the rosette to pre-bud stage;

0.17 L / acre	Provides top growth control of Canada thistle for 6 to 8 weeks.
0.23 L / acre	Provides season long control of Canada thistle. Not all root stalks will be killed and some regrowth may occur by the end of the growing season.
0.34 L / acre	Provides season long control of Canada thistle with suppression into the following year.

Cost (2006 suggested retail price):

$26.04 to $52.05 per acre.

Application Information:

Water Volume: 40 to 89 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to table 2 on page 29.

Effects of Growing Conditions:

Poor control may occur under dry conditions. Injury to flax may occur when tank mixing with MCPA. To reduce the risk of crop injury, do not apply tank mixes if temperature exceeds 27°C.

Tank Mixes:

Herbicides:

Lontrel applications following applications of products containing bromoxynil (Approve, Badge, Bromotril, Buctril M, Koril, Logic M, Mextrol, Pardner, Thumper) should be delayed by 14 days to allow the Canada thistle to recover from leaf burn.

Recommended rates of Lontrel may be used for each crop unless otherwise indicated.

In Canola:
Poast Ultra plus Merge adjuvant.
Fusion (Lontrel at 0.23 L / acre).
Roundup Original* / Transorb* (Lontrel at 0.112 L / acre).
Odyssey** (Lontrel at 0.17 to 0.23 L / acre).
Select plus Amigo adjuvant (Lontrel at 0.17 to 0.34 L / acre).
Vantage* / Vantage Plus* (Lontrel at 0.112 L / acre).

* Roundup Ready varieties only
** CLEARFIELD varieties only

In Flax:
MCPA amine or ester - 0.34 to 0.45 L / acre
(Lontrel at 0.17 L / acre)
Poast Ultra plus Merge adjuvant.
Poast Ultra + MCPA Ester (rates as above)
Select plus Amigo adjuvant.

In Spring wheat (NOT including durum) and barley:
Lontrel at 85 mL/acre for the following mixes:
Refine Extra (8 g / acre) + 2,4-D (0.28 L / acre - 600g / L formulation) plus non-ionic surfactant.
Refine Extra (8 g / acre) + MCPA (0.34 L / acre - 500g / L formulation) plus non-ionic surfactant.
Lontrel at 0.11 to 0.17 L/acre for the following mix:
2,4-D or MCPA (amine or ester) at label rates.

In Oat:
MCPA amine or ester (Lontrel at 0.11 to 0.17 L / acre).

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Lontrel label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance.

Check labels of products to be mixed for directions.

General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Crops or areas treated with this product may be grazed immediately following treatment.

Recropping: Lontrel residues in the soil may affect succeeding crops. The year after application, replant to wheat, barley, oats, rye, flax, forage grasses, mustard or canola.

Do not use manure from animals fed or bedded with Lontrel-treated straw except on fields that are to be sown to Lontrel-tolerant crops.

Aerial Application: Do not apply by air.

Storage: Store in heated storage. If product is frozen, bring to room temperature and agitate before use.

Environment: Avoid contamination of non-target land, water or irrigation ditches.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

Danger Eye Irritant

MCPA

Herbicide Group – 4
(Refer to page 27)

Company, Formulation and Cost (2006 suggested retail prices):

	Price per L (PCP number)											
	500 Ester**†		600 Ester**		500 Amine*		600 Amine*		400 (K) Potassium salt*		300 (Na) Sodium salt*	
IPCO	$8.90†	(20307)	$11.80	(27802)	$7.75	(20308)	—	—	$7.90	(20305)	$6.00	(20306)
Nufarm Agriculture	$9.30†	(27054)	$11.50	(27803)	$8.25	(14730)	N / A	(28384)	$7.05	(17564)	$6.30	(14718)
UAP	$9.49†	(22199)	N / A	(27804)	$8.49	(9516)	—	—	$6.15	(14188)	$6.47	(9858)

* formulated as a solution. ** formulated as an emulsifiable concentrate.

Crops, weeds and rates and other application details may differ with different product labels. Consult specific product labels for more information.

† These older formulations are no longer produced by the manufacturers, but quantities may still remain in the retail system. Prices on older formulations have not been established by the manufacturer since 2005 and actual retail price may differ from those listed here. These products may be removed from future editions.

Crops, Rates and Staging:

The maximum safe rates for various crops are given below. Higher rates used for harder to control weeds (see "Weeds, Rates and Staging") may cause crop injury. Application rates for individual products may vary from those listed. Refer to the label for product specific use rates. Rates greater than these for harder to control weeds may cause crop injury. When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

CROP	STAGE	RATE (L/ACRE)				
		AMINE	AMINE or ESTER 600	ESTER 500	K SALT	NA SALT
Wheat (spring and durum), barley	3 leaf to early flag leaf.	0.45	0.43	0.45	0.53	0.81
Oats	3 leaf to early flag	0.45	0.36	0.45	0.53	0.81
Spring rye	2 leaf to early flag leaf.	0.45	0.43	0.45	NR	0.81
Flax (not Solin varieties)	2 inches (5 cm) in height to prebud stage. Apply at 2 to 4 inches (5 to 10 cm) in height for maximum crop tolerance.	0.4	0.28 (E) or 0.34 (A)	0.34	0.65	0.71
Winter wheat, fall rye	In spring, apply from the time growth commences until the early flag leaf stage.	0.45	0.43	0.45	NR	0.81
Corn	As a broadcast spray up to 6 -7 in. (15 -18 cm) tall or 6 leaf stage. Up to 3 weeks before tassling as a directed spray using drop nozzles.	0.45	0.37 (Amine only)	NR	NR	0.71
Peas	Vines 4 to 7 inches (10 to 18 cm) long. For short-statured, determinate flowering peas, apply at the early stages within this range.	0.22*	0.17 (Amine only)	NR	NR	0.36*

(E) or (A) indicates Ester or Amine formulations.

Crops, Rates and Staging continued on next page.

Crops, Rates and Staging continued

CROP	STAGE	RATE (L/ACRE)				
		AMINE	AMINE or ESTER 600	ESTER 500	K SALT	NA SALT
Cereals underseeded to alfalfa (not Flemish varieties)	Apply when the majority of seedling legumes are in the 1 to 3 trifoliate leaf stage.	0.23	0.19 (Amine only)	NR	NR	0.4
Underseeded alsike, ladino and red clover	Apply when the majority of seedling legumes are in the 1 to 3 trifoliate leaf stage.	0.28	NR	NR	NR	0.4
Red clover✧ Seedling (seed and forage) Established✧ (seed only)	Seedlings: 1 -3 trifoliate stage. Do not feed to livestock in the first year. Established: Apply at the breaking of dormancy in the spring up to 7.5 cm.	0.23	0.19 (Amine only)	NR	NR	NR
Grass pastures	Spring or fall.	1.42	1.13 (E) or 1.42 (A)	1.38	NR	2.8
Seedling forage** grasses (not for seed)	Apply from the 3 leaf stage to the shot blade stage.	0.45**	NR	NR	NR	NR
Established forage** grasses (not for seed)	Apply in the spring up to the shot blade stage or in the fall after harvest.	0.45**	NR	NR	NR	NR

(E) or (A) indicates Ester or Amine formulations.

NR = Not Registered

* The rates given are lower than the registered rates for peas. Less than the maximum label rates are recommended because of crop injury concerns.

** MCPA is NOT registered for use on forage grasses, any such use is entirely at the risk of the user.

✧ Nufarm Agriculture MCPA Amine only.

Formulation Characteristics:

Formulation	Risk of Vapour Drift	Activity on Weeds	Risk of Crop Injury
LV Ester	Medium	Fast	Medium
Amine	Very Low	Medium	Low
Salts	Very Low	Slow	Very Low

Weeds, Rates and Staging:

Apply at lower rates when weeds are small (2 to 4 leaf stage) and actively growing. Higher rates are needed when weeds are larger, in heavy populations, or growing under stressful conditions (excessively cold, hot, dry or wet). Lower rates may be applied in late fall to control winter annual weeds.

NOTE: The following rates are a general range for all products. Rate ranges for individual products may differ slightly. Consult the product label for specific rates for each application.

\+ Not controlled by MCPA K salt formulation

++ Not controlled by MCPA K or Na salt formulations

Susceptible weeds:

Amine and Ester 500 formulations – 0.28 to 0.45 L / acre
Amine and Ester 600 formulations – 0.24 to 0.36 L / acre
K formulations – 0.61 to 0.71 L / acre.
Na formulations – 0.5 to 0.81 L / acre.

Burdock
Cocklebur
Flixweed (late fall applications or small seedlings)*
Kochia
Lamb's-quarters
Mustards (except dog and tansy)
Prickly lettuce+
Ragweed
Russian pigweed
Shepherd's purse*
Stinkweed*
Wild Radish
Wild Sunflower+

* Winter annual weeds

Harder to control weeds:

Amine & Ester 500 formulations – 0.45 to 0.71 L / acre.
Ester 600 formulations – 0.42 to 0.61L / acre.
K formulations – 0.71 to 0.81 L / acre.
Na formulations – 0.81 to 1.1 L / acre.

Annual sow thistle+
Biennial wormwood+
Bluebur+
Common peppergrass+
Curled dock+
Flixweed (overwintered rosettes prior to bolting)+
Goat's-beard+
Goosefoot+
Hemp-nettle (suppression only)
Mustard (dog and tansy)+
Plantain+
Purslane+
Redroot pigweed+
Smartweed (annual)+
Tumble pigweed+

Top growth control only (rates as for harder to control weeds):

Blue lettuce+
Canada thistle
Dandelion++
Gumweed+
Field bindweed+
Hedge bindweed+
Hoary cress+
Leafy spurge+
Perennial sow thistle+
Russian thistle++

Application Information:

Water Volumes:
Cereals, flax, pastures, forage grasses: 40 to 81 L per acre.
Peas: Minimum 61 L per acre.
Cereals Underseeded to Forage Legumes: 61 to 81 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Best weed control occurs when temperatures are above 21°C (daytime) or 10°C (night time) and humidity is above 70 percent. Do not apply if temperature exceeds 27°C. If applying to flax, injury and a delay in maturity may result from application under hot or humid conditions. Extremely hard water may reduce performance or cause problems in spraying the product.

Tank Mixes:

Herbicides:
In Wheat and barley:
Avenge (500 ester only).
Banvel II (amine and K salt only).
Pardner (K salt only).
Linuron and Sencor (500 amine only).

In Oats:
Pardner (K salt only).
Linuron (500 amine only).

Not all brands are labelled for tank mixing. Check the product label prior to use for registered mixes and rates. Follow all precautions and restrictions on both labels.

Fertilizers: Liquid nitrogen (28-0-0) may be used in place of water as a carrier with certain amine formulations for application in spring to winter wheat or fall rye.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the MCPA labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours of MCPA Na salt or MCPA K salt, 4 hours of MCPA amine, or 2 hours of MCPA ester application will reduce control.

Grazing: Do not graze within 7 days of application.

Recropping: No restrictions the year after application.

Aerial Application: Some products may be applied by air to specific crops. Check the label for detailed instructions.

Storage: MCPA ester may be frozen. Do not freeze MCPA amine, MCPA sodium salt and MCPA K.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison

MCPB + MCPA

Herbicide Group – 4
(Refer to page 27)

Company:

IPCO (Clovitox Plus – PCP#24336)
Nufarm Agriculture (Tropotox Plus – PCP#8211)
UAP (Topside – PCP#22003)

Formulation:

375 g/L MCPB, 25 g/L MCPA present as sodium salts and formulated as a solution. Container size - 10 L.

Crops, Rates and Staging:

Registered for all products:
Apply 1.11 to 1.72 L per acre. Apply only that needed to control the target weeds.

CROP	STAGE
Peas	3 to 6 expanded leaves.
Clover (alsike, ladino, red, white Dutch, wild white)	Monofoliate to 3 trifoliate leaf stage (with or without a cover crop).
Oats, wheat, rye or barley (alone or as a companion crop)	2 leaf to flag leaf stage.
Field corn	45 cm high to the start of tassling – use drop nozzles.
Established pasture	After grazing or cutting when weeds have regrown to a susceptible stage.

Seedling Forage Grasses:
Apply at 1.11 to 1.42 L per acre from the 2 to 4 leaf stage:

Bromegrass (smooth, meadow)
Fescue (altai, creeping red, meadow, tall)
Green needlegrass
Reed canarygrass
Timothy
Wheatgrass (crested, intermediate, northern, pubescent, slender, streambank, tall, western)
Wild ryegrass (altai, Russian)

Registered for Tropotox Plus, and Clovitox Plus only:
Seedling alfalfa for seed production* at the 3 to 6 trifoliate stage.

Note: Seedling alfalfa vigour may be reduced in the year of treatment, however, the crop recovers and yield will not normally be affected.

* Since this use is registered under the User Requested Minor Use Label Expansion program, the manufacturers assume no responsibility for herbicide performance. Users of this treatment to seedling alfalfa do so at their own risk.

Weeds, Rates and Staging:

WEEDS	STAGE	RATE (L/ACRE)
Ball mustard, Lamb's-quarters, Stinkweed, Wild mustard, Wormseed mustard	Seedlings	1.11
Annual sow-thistle*, Hemp-nettle*, Redroot pigweed, Ragweed, Shepherd's-purse, Volunteer rapeseed (including canola), Wild Radish*	Seedlings	1.72
Curled dock, Perennial sow-thistle**, Plantain	Rosette	1.72
Bull thistle	Rosette to early bud	1.72
Buttercup (Creeping, Tall), Field Bindweed	In spring during rapid growth	1.72
Canada thistle	6 inches (15 cm) to early bud	1.72
Horsetail*	6 inches (15 cm)	1.72

* Suppression only
**Topgrowth control only

Cost (2006 suggested retail prices):

Clovitox Plus: $15.25 per L
Topside: $14.00 per L
Tropotox Plus: $13.65 per L

Application Information:

Water Volume:
Clovitox Plus: 71 to 91 L per acre.
Tropotox Plus, Topside: 61 to 81 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Damage to peas or seedling forage legumes may occur if the crop is sprayed when under drought or disease stress. Under extremely hot or humid conditions, crop injury may be severe. Do not apply when temperatures are over 27 degrees C. Best activity on weeds occurs in warm weather.

Tank Mixes:

None registered.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze crop treated with Topside or cut for hay in the year of establishment. Cereals or pastures treated with Tropotox or Clovitox may be used for grazing or cut for greenfeed or hay 30 days after application. Forage legumes and peas treated with Clovitox may be used for animal feed 30 days after application.

Recropping: No restrictions listed. Phenoxy herbicides can persist in soils for weeks, particularly if dry or cool weather persists.
Do not seed sensitive crops immediately after spraying.

Aerial Application: Clovitox may be applied by air to established pasture and cereal crops (not underseeded to clover).

Storage: Do not freeze.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Danger Poison - Clovitox Plus


Caution Poison - Tropotox Plus & Topside

Mecoprop-P

Herbicide Group – 4
(Refer to page 27)

Company:

United Agri-Products (Mecoprop-P – PCP#27891)
Nufarm Agriculture (Compitox – PCP#27824)

Formulation:

150 g/L mecoprop-P present as potassium salt. Container size - 10 L.

Crops and Staging:

Spring wheat (including durum), barley and oats - 3 leaf to flag leaf stage.

Weeds and Staging:

Apply to weeds from the 2 to 4 leaf stage.

Black medic
Canada thistle
(top growth control only)
Chickweed
Cleavers
Clover (volunteer)
Corn spurry
Lamb's-quarters
Plantain
Wild mustard

Cost (2006 suggested retail price):

Compitox: $9.31 per L.
Mecoprop-P: $7.41 per L.

Rates:

2.2 to 2.8 L / acre.

Use the high rate for weeds in an advanced stage of growth.

Application Information:

Water Volume: 81 to 121 L per acre.

Pressure: 40 psi (275 kPa).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Apply in warm weather under good growing conditions. Avoid spraying in very hot weather or in drought conditions.

Tank Mixes:

None registered.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze or feed treated crop to livestock prior to crop maturity.

Recropping: No restrictions the year after application.

Aerial application: Not registered.

Storage: Do not freeze.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Muster Gold II

Herbicide Group – 1, 2
(Refer to page 27)

This product is a prepackaged tank mix of Muster (page 161) and Assure II (page 67). Information listed is restricted to Crop, Weeds, Rates, and Cost. For other detailed information on the component products see the product pages listed above.

Company:

E. I. duPont Canada

Formulations:

Muster Gold II contains 3 components:

Muster (PCP#23569): 75% ethametsulfuron-methyl as a water dispersible granule. Container size - 4 x 80 g water soluble bags.

Assure II (PCP#25462): 96 g/L quizalofop-p-ethyl as an emulsifiable concentrate. Container size - 8 L.

Merge adjuvant (PCP#24702). Container size - 8 L

Crops and Staging:

Canola, including all herbicide tolerant canola varieties.

2 leaf stage to the beginning of bolting. If application is made prior to this stage, severe crop injury may occur.

Weeds and Staging:

Grasses:
Apply at the 2 leaf to early tillering stage unless otherwise noted. For best results on volunteer cereals & wild oats apply before tillering begins.

Barnyard grass
Fall pannicum
Foxtail (green and yellow)
Old witchgrass
Proso millet
Quackgrass* (2 to 6 leaf)
Volunteer cereals
Volunteer corn
Wild oat

Broadleaf weeds:
Apply at the cotyledon to 6-leaf stage unless otherwise noted.

Flixweed	Stinkweed (1 to 4 leaf)
Hemp-nettle	Wild mustard
Redroot pigweed*	Smartweed / lady's-thumb

*Suppression only

Cost (2006 suggested retail price):

$22.11 per acre.

Rates:

Muster: 8 g per acre.

Assure II: 0.2 L per acre.

Merge adjuvant: 0.2 L per acre (as packaged).

A case of Muster Gold II will treat 40 acres (16 ha).

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 L per acre.

Pressure: 30 to 40 psi (210 to 275 kPa).

Nozzles: Flat fan nozzles with 50 mesh line strainers and screens.

Muster Toss-N-Go

Herbicide Group – 2
(Refer to page 27)

Company:

E. I. duPont Canada (PCP#23569)

Formulation:

75% ethametsulfuron-methyl formulated as a dry flowable.

Container sizes – 320 g package (containing 4 x 80 g water soluble bags).

Crops and Staging:

Canola: From the 2 leaf stage (main stem leaves) to the start of bolting. Do not apply prior to this stage as severe crop injury can occur.

Condiment mustard (brown & oriental only): From the 4 leaf stage but prior to bolting. Do not apply prior to this stage as severe crop injury can occur.

Sunflower: 2 to 8 leaf stage (15 to 45 cm).

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Apply from the 2 to 6 leaf stage. Stinkweed must be sprayed in the 1 to 4 leaf stage

At the 8 g / acre rate (one 320 g package treats 40 acres):

Flixweed *	Stinkweed **
Green smartweed	Wild mustard
Hemp-nettle	

The 12 g / acre rate (one 320 g package treats 26.7 acres)*** controls above weeds plus:
Stinkweed
Redroot pigweed **

* Spring seedlings only.

** Suppression with Muster alone but control with Assure II plus Sure-Mix or a Poast Ultra plus Merge tank mix.

*** High rate is for use in canola and sunflower only. DO NOT use high rate on condiment mustard crops.

Muster applied alone requires the addition of Agral 90, Agsurf, or Citowett at 0.2 L per 100 L of spray solution. Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$16.93 to $25.36 per acre.

Application Information:

Water Volume: 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Equipment and Nozzles: Flat fan nozzles. Sprayer must be equipped with continuous agitation. Use 50 mesh or coarser strainers and screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not use on crops that are stressed because of drought or flooding. Less than acceptable control will occur in fields where high weed populations exist and where stressful environmental conditions prevail (drought, cold weather). Heavy rainfall soon after application may result in visual crop injury or possible yield reduction. Thin crop stands or application prior to the 2 leaf stage, sandy soils or soils with low organic matter may increase the severity of the injury.

Tank Mixes:

Do not mix with substances that contain boron or that release chlorine.

Herbicides:
Canola only: Assure II, or Poast Ultra. The adjuvants used with these products are all that are required for tank mixes.

Fertilizers: None registered. Do NOT mix soluble bags with liquid fertilizers.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Muster label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 4 to 6 hours may reduce control.

Grazing: Do not graze or feed crop to livestock within 60 days of application. Do not graze sunflowers treated with Muster.

Preharvest: Leave at least 60 days from application to harvest.

Recropping: Do not sow wheat, barley, oats or flax within 10 months of application. Do not sow canola, lentils, peas, fababeans, tame mustard, alfalfa, canaryseed, dry beans, fescues or red clover within 22 months of application. All other crops must not be sown until a “field bioassay” is performed at 22 months (or more) after application. Growers may experience reduced yields if other crops (such as corn) are grown without following these guidelines.

Aerial Application: Do not apply by air.

Storage: May be frozen.

Environment: Leave a 15 m buffer between the last sprayer pass and wetland areas or waterways. Leave a 5 m buffer between the last spray pass and woodlots, shelterbelts, ditch bank vegetation and the borders of dry sloughs.

Tank Cleaning:

Sprayers used to spray Muster should be flushed out immediately after Muster is used. The manufacturer recommends that sprayers used to apply this product be flushed twice with a water / household ammonia rinse (1L of 3 % ammonia per 100 L water). All nozzles, screens and filters should be removed and cleaned after applying this product.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Refer to page 14 for additional information.

Odyssey

Herbicide Group – 2
(Refer to page 27)

Company:

BASF Canada (PCP#25111)

Formulation:

35% imazamox and 35% imazethapyr formulated as a dispersible granule.

Container size - 8 x 86.5 g water soluble packs per 40 acre case.

Crops and Staging:

Field peas -1 to 6 above-ground nodes (1 to 6 true leaves).
CLEARFIELD canola -2 to 6 leaf stage.
CLEARFIELD lentil -1 to 6 above ground nodes.

Temporary crop yellowing may be observed shortly after application in field peas, CLEARFIELD lentil and CLEARFIELD canola.

Forage Crops (seed production only)
Alfalfa (seedling or established) – 1 to 4 leaf stage.

Weeds, Rates and Staging:

At 17 g/acre (40 acres per case), Odyssey will control:
Grasses - 1 to 4 main stem leaves, until tillers are visible:

Barnyard grass	Volunteer cereals
Green foxtail	(wheat, barley, oats)
Persian darnel	Wild oat

Broadleaf Weeds - cotyledon to 4 leaf stage unless otherwise indicated:

Chickweed	Shepherd's-purse
Cleavers (up to 4 whorls)	Stinkweed
Flixweed	Stork's-bill
Green smartweed	Volunteer canola (not
Hemp-nettle*	CLEARFIELD varieties)
Kochia**	Volunteer tame mustard
Lamb's-quarters***	Wild buckwheat*
Redroot pigweed	Wild mustard
Russian thistle****	

* Suppression only in field peas and CLEARFIELD lentils.
** Suppression only in field peas and CLEARFIELD canola, not controlled in CLEARFIELD lentils.
*** Suppression only.
**** Supression only in CLEARFIELD lentils.

Merge adjuvant (sold separately) must be used with Odyssey.

CLEARFIELD Canola, Clearfiled Lentil, and Peas: Use only Merge adjuvant at a rate of 0.5 L of Merge in 100 L of spray solution.

Alfalfa: Apply at 40 L / acre of water with Merge or Amigo adjuvants alone at a rate of 0.5 L adjuvant per 100L spray solution or with a non-ionic surfactant (Agral 90, Agsurf or Surf 92) and a fertilizer solution (28-0-0 or 32-0-0) at a rate of 0.25L non-ionic surfactant per 100 L spray solution plus 0.8 L / acre fertilizer.

Do not apply Odyssey more than once per year.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$25.17 per acre.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan. Use 50 mesh or coarser filter screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

No information provided on the product label. Plants are under stress when conditions before or after application are very hot or cold, or excessively dry or wet. During periods of stress, plants are not actively growing and reduced weed control or crop injury may result.

Tank Mixes:

Herbicides:
In CLEARFIELD canola only:
Lontrel (0.17 - 0.23 L / acre).

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Odyssey label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall within 3 hours of application may reduce control.

Grazing: Do not graze treated crop or cut for feed prior to crop maturity. Field peas may be fed to livestock 30 days after application. Do not harvest forage or cut for hay.

Preharvest Interval: Do not apply within 60 days of harvest.

Recropping: Field peas, lentils, CLEARFIELD canola, canaryseed, oat, barley and spring wheat (including durum) may be seeded the first spring after application. Flax, canola and sunflower may be seeded the second spring after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above.

NOTE: Breakdown of Odyssey may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on recropping interval (1-877-371-2273).

Aerial Application: Do not apply by air.

Storage: Do not freeze. Store in a cool, dry place above 5° C.

Environment: Avoid spraying in situations where drift may occur. Leave a buffer zone of at least 14 m between the outside boundary of the sprayed area and sensitive areas such as shelterbelts, hedgerows, wetlands, woodlots, vegetated ditch banks, ponds, streams, and sloughs.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Warning Eye and Skin Irritant

Odyssey DLX

Herbicide Group – 1, 2
(Refer to page 27)

Company:

BASF Canada (PCP# 25111)

Formulation:

The Odyssey DLX package contains two components:

Odyssey (PCP#25111): 35% imazamox and 35% imazethapyr formulated as a dispersible granule.
Container size -8 x 86.5 g water soluble bags per 40 acre case.

Tepraloxydim (PCP# 27603): 200 g/L tepraloxydim as an emulsifiable concentrate.
Container size -2.67 L jug.

Crops and Staging:

Field peas - 1 to 6 above-ground nodes (1 to 6 true leaves).
CLEARFIELD lentil - 1 to 6 above-ground nodes.

Temporary crop yellowing may be observed shortly after application in field peas and CLEARFIELD lentils.

Weeds and Staging:

Grasses - 1 to 4 main stem leaves, until tillers are visible:

Barnyard grass	Volunteer oats
Persian darnel	

Grasses – 1 to 6 main stem leaves, until tillers are visible:

Green foxtail	Volunteer barley
Wild oats	Volunteer wheat

Broadleaf Weeds - cotyledon to 4 leaf stage unless otherwise indicated:

Chickweed	Shepherd's-purse
Cleavers (up to 4 whorls)	Stinkweed
Flixweed	Stork's-bill
Green smartweed	Volunteer canola (not CLEARFIELD varieties)
Hemp-nettle*	
Kochia*	Volunteer tame mustard
Lamb's-quarters*	Wild buckwheat*
Redroot pigweed	Wild mustard
Russian thistle	

* Suppression only in field peas.

Rate:

Odyssey: 17 g per acre.

Tepraloxydim: 67 mL per acre.

One case of Odyssey DLX will treat 40 acres.

Merge adjuvant (sold separately): Merge must be used with Odyssey DLX at a rate of 0.5 L of Merge in 100 L of spray solution.

Add components in the order listed above.

Do not apply Odyssey DLX more than once per year. Refer to the product label for complete mixing instructions for this product. A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$30.17 per acre.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan. Use 50 mesh or coarser filter screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

No information provided on the product label. Plants are under stress when conditions before or after application are very hot or cold (15°C or less), or excessively dry or wet. During periods of stress, plants are not actively growing and reduced weed control or crop injury may result.

Tank Mixes:

Herbicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall within 3 hours of application may reduce control.

Grazing: Field peas may be fed to livestock 60 days after application.

Preharvest Interval: Do not apply within 60 days of harvest.

Recropping: Field peas, lentils, CLEARFIELD canola, canaryseed, oat, barley and spring wheat (including durum) may be seeded the first spring after application. Flax, canola and sunflower may be seeded the second spring after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above.

NOTE: Breakdown of Odyssey may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on recropping intervals (1-877-371-2273).

Aerial Application: Do not apply by air.

Storage: Do not freeze. Store in a cool, dry place above 5°C.

Environment: Avoid spraying in situations where drift may occur. Leave a buffer zone of at least 14 m between the outside boundary of the sprayed area and sensitive areas such as shelterbelts, hedgerows, wetlands, woodlots, vegetated ditch banks, ponds, streams, and sloughs.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Warning Eye and Skin Irritant

Option 35 DF/Option 2.25 OD

Herbicide Group – 2
(Refer to page 27)

For use in Manitoba only.

Company:

Bayer CropScience

Formulations:

Option 35 DF (PCP#27425): 35% foramsulfuron formulated as a dispersible granule.
Container size – 8 x 100 g packets per case.

Option 2.25 OD (PCP#27424): 22.5 g/L foramsulfuron formulated as an emulsifiable concentrate.
Container size – 12.6 L jug.

Crops and Staging:

Field corn at the 1 to 8 leaf stage or 5 to 6 visible collars

Weeds and Staging:

Annual Grasses:

WEED	LEAF STAGE
Barnyardgrass	1 to 6 (to early tillering)
Foxtail, green and yellow	2 to 5 (to early tillering)
Proso millet	2 to 5 (to early tillering)
Witchgrass	2 to 4

Broadleaf Weeds:

WEED	LEAF STAGE
Chickweed, common	4 to 6
Lamb's-quarters	4 to 8
Mustard, wild	5 to 7
Mustard, wormseed	5 to 9
Nightshade, eastern black	1 to 5
Pigweed, redroot	1 to 7
Ragweed, common*	2 to 4

* Suppression only.

Cost (2006 suggested retail price):

N/A

Rates:

Option 2.25 OD: 0.63 L per acre (20 acres per jug) plus 28% UAN (liquid 28-0-0) at 1.0 L per acre.

Option 35 DF: 40.5 g per acre (20 acres per case) plus 28% UAN (liquid 28-0-0) at 1.0 L per acre plus Hasten Adjuvant at 0.71 L per acre.

NOTE: Option 35 DF and Option 2.25 OD must be tank mixed with Banvel II at 121 mL per acre.

Add Option 35 DF or Option 2.25 OD to a half full tank, followed by Banvel II, then 28% UAN then Hasten adjuvant (for use with Option 35 DF only).

Application Information:

Water Volume:
Option 35 DF: 89 L per acre.
Option 2.25 OD: 60 L per acre

Pressure: 25 to 40 psi (175 to 275 kPa).

Nozzles: Either 80 or 110 flat fan nozzles designed for even coverage and canopy penetration. Use with 50 mesh or larger screens

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Under optimum conditions weed growth ceases within 1 to 3 days and yellowing of the growing point occurs in 5 to 10 days. Warm moist conditions provide for the best activity. Activity may be reduced or delayed if applied under cool and/or dry conditions or in the presence of heavy dew, fog, mist or rain or if weeds are dust covered. If the crop or weeds are under stress due to environmental conditions, delay application until the both crop and weeds have resumed active growth.

Tank Mixes:

Herbicides:
Banvel II (121 mL/acre)*.

Fertilizers: Do not use any fertilizers or additives other than 28% UAN (1 L/acre), recommended*.
Insecticides: Avoid application to corn that has been treated with organophosphorous insecticides.

Fungicides: None registered.

*Option 35 DF herbicide must be applied to corn in Manitoba as a tank-mixture with Banvel II herbicide, 28% UAN and Hasten adjuvant. Option 2.25 OD herbicide must be applied to corn in Manitoba as a tank-mixture with Banvel II herbicide and 28% UAN. See Rates section above.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13

Restrictions:

Rainfall: Within 6 hours may reduce control.

Grazing: Do not graze treated corn crops or cut for forage within 45 days of application.

Preharvest Interval: Do not harvest for grain corn within 70 days of application.

Recropping: The following crops may be grown the season following application: alfalfa, barley, beans (dry common), canola, clover (red), corn (field and sweet), oats, peas, potatoes, soybeans, timothy, spring wheat. Winter wheat may be seeded 4 months after application.

Aerial Application: Do not apply by air.

Storage: Keep dry.

Re-entry period: Once spray residues are dry.

Environment: A buffer zone of 34 meters (Option 35 DF) or 20 meters (Option 2.25 OD) is required between the downwind edge of the boom and other non-target land plants and 15 meters from the downwind edge of the boom and water bodies and wetland areas.

Tank Cleaning:

Option residues in the spray tank can cause severe injury to sensitive crops at very low concentrations. Sprayers should be cleaned out immediately before using another product. Follow the steps below:

1. Drain the tank and thoroughly rinse the spray tank, boom and hoses with clean water. Pay particular attention to flushing out any visible deposits.
2. Fill the tank with ammonia / water solution (1 L of 3% household ammonia per 100L of water) and flush the hoses, boom and nozzles with the solution. Circulate for at least 15 minutes. Flush hoses, boom and nozzles once more, then drain the tank.
3. Remove all nozzles, screens and filters and clean in a separate container using an ammonia / water solution as above.
4. Repeat #2.
5. Rinse tank, boom and hoses with clean water. And wash any residue from the outside of the tank.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk. For additional information on tank cleaning see page 14.

Hazard Rating:

Warning – Skin and Eye Irritant.

Pinnacle

Herbicide Group – 2
(Refer to page 27)

Company:

E. I. duPont Canada (PCP#22002)

Formulation:

75% thifensulfuron methyl as a water dispersible granule. Container size – 8 x 8 g water soluble pouches.

Crops and Staging:

Soybeans - First fully expanded trifoliate leaf to flower initiation.

Weeds and Staging:

Apply up to 4 inches (10 cm) tall or wide:

Lady's-thumb	Wild mustard
Lamb's-quarters*	Velvetleaf*
Redroot pigweed	

* High rate of application only.

Cost (2006 suggested retail price):

$ 9.85 to $14.04 per acre.

Rates:

2.2 to 3.2 g / acre (one container treats 20 to 28.5 acres).

Requires the addition of a non-ionic surfactant such as Agral 90, Agsurf, or Citowett at 1 L per 1000 L of spray solution. Oil surfactant blends such as Assist, CanPlus 411 or Sure-Mix may be used as adjuvants (check label for use rates).

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: Minimum of 45 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat Fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Pinnacle applied to crops that have been under stress before application may result in crop injury. Stress conditions within 3 days after application may also result in crop injury.

Weeds under stress conditions at the time of application may not be adequately controlled.

Stress conditions are severe weather conditions, frost, low fertility, drought, water-saturated soils, and disease or insect damage.

Injury symptoms can be crop discoloration (yellowing, purpling or reddening), or stunting.

Tank Mixes:

Herbicides:
Assure II (0.2 L / acre) plus Sure-Mix*.
Basagran (0.71 or 0.91 L / acre) plus Assist adjuvant*.
Basagran Forté (0.71 or 0.91 L / acre)*.
Assure II (0.25 L / acre) plus Basagran Forte (0.71 or 0.91 L / acre) plus Sure-Mix or CanPlus 411 adjuvant*.

*Refer to appropriate labels for Pinnacle and adjuvant rates of application.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Pinnacle label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: If rainfall occurs soon after application control may be reduced. Several hours of dry weather are needed after application to allow uptake by the plants.

Grazing: Do not graze or cut for feed.

Pre-harvest: Leave at least 60 days from application to harvest.

Recropping Interval: Do not plant any crop other than wheat or barley for 30 days after application.

Aerial Application: Do not apply by air.

Storage: Store in closed original container in a dry area away from food or feed.

Environment: Do not mix, load or apply within 15 m of water bodies, wetlands or sensitive plants. Do not apply to irrigated land where the drainage water is also used to irrigate cropland.

Tank Cleaning:

Pinnacle can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Pinnacle should be flushed out immediately after use. The manufacturer recommends that sprayers used to apply this product be flushed twice with a water / household ammonia rinse (1 L of 3 percent ammonia per 100 L of water). All nozzles, screens and filters should be removed and clean separately during the cleaning process. Do a clean water rinse of the tank, booms, hoses and nozzles to complete the procedure.

Refer to page 14 for additional information.

Poast Ultra

Herbicide Group – 1
(Refer to page 27)

Company:

BASF Canada (PCP#24835)

Formulation:

450 g / L sethoxydim formulated as an emulsifiable concentrate.

Container size – 2 x 7.7 L jug of Poast Ultra.

Crops, Rates and Staging:

Crops are tolerant at all growth stages. However, the pre-harvest interval outlined in the "Restrictions:" section must be followed to avoid unacceptable residues of sethoxydim in harvested crops.

To a maximum rate of 0.45 L per acre:

Alfalfa
Alsike clover*
Canola
Chickling vetch
Cicer milkvetch*
Creeping red fescue (for seed only)
Dry beans (adzuki, kidney, lima, mung, pinto, white)
Dry field peas
Fababeans
Flax (not including Solin)
Lentil
Mustard
Potatoes
Sainfoin*
Shelterbelts
Soybeans
Sunflower
Sweet clover*

To a maximum rate of 0.26 L per acre:

Alsike clover**
Caraway
Cicer milkvetch**
Coriander
Dill
Safflower
Sainfoin**
Solin (low linolenic flax)
Sweet clover**

To a maximum rate of 0.23 L per acre:
Tame buckwheat

To a maximum rate of 0.19 L per acre:
Chickpea

* Established stands
** Seedling stands

Weeds, Rates and Staging:

Optimum yield response occurs when weeds are controlled early.

WEEDS AND STAGES	RATE (L/ACRE)	ACRES TREATED PER 7.7 L CONTAINER
Green or yellow foxtail, barnyard grass, volunteer corn, Persian darnel, proso millet, witchgrass, large crabgrass and fall panicum -1 to 6 leaf stage	0.13	60
Wild oats, volunteer wheat, oats and barley -1 to 6 leaf stage except for low rate (See footnote*)	0.13* or 0.19	60 or 40
Quackgrass suppression -1 to 3 leaf stage	0.19	40
Quackgrass (season long control) -1 to 3 leaf stage	0.45	17
Foxtail barley suppression -prior to tillering	0.45	17

*Use the low rate in canola, flax and peas when wild oat, volunteer wheat and volunteer barley are from 1 to 4 leaves (best results prior to tillering) and under ideal growing conditions (adequate moisture, good fertility and moderate temperatures -15 to 28°C). Do not apply under stress conditions.

Merge Adjuvant (sold separately): Merge must be used with Poast Ultra when applied alone or in tank-mix with other herbicides. When Poast Ultra is applied alone use 0.5 L to 1.0 L of Merge per 100 L of the final volume of spray solution. When applying to quackgrass and/or foxtail barley use 1.0 L Merge per 100 L of spray solution. See the tank mix section for Merge rates for tank mixing.

Cost (2006 suggested retail prices):

$8.78 to $31.00 per acre.

Application Information:

Water Volume: Apply at water rates of 20 to 40 L/acre Use a minimum of 40 L/acre if crop or weed growth is dense, and when spraying quackgrass.

Use 20 to 40 L/acre when using the 0.19 L/acre rate for wild oats, volunteer wheat and volunteer barley.

Pressure: 40 to 45 psi (275 to 300 kPa).

Nozzles: Stainless steel 80° or 110° flat fan nozzles tilted forward at an angle of 45°.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Most effective control is achieved when grasses are actively growing. Weeds stressed by drought, flooding, hot or prolonged cool temperatures (<15°C) and poor fertility are more difficult to control. Use the higher of the recommended rates for grasses stressed for less than 20 days. Do not apply to grasses stressed more than 20 days because of lack of moisture. Control may be reduced if temperatures are below 15°C. Retillering may occur under stress conditions or if fertility is low.

Tank Mixes:

Herbicides: The following tank mixes can be applied with 0.13 to 0.19 L/acre of Poast Ultra.

Merge Adjuvant (sold separately): Use at 0.75 to 1.0 L of Merge per 100 L of mixed spray solution for most mixes except when mixing with Pursuit use 1.0 L per 100 L of solution.

In Flax:
Buctril M (0.405 L/acre) (including Solin).
Lontrel 360 (0.23 to 0.34 L/acre).
Lontrel 360 (0.23 to 0.34 L/acre) + MCPA Ester (0.34 to 0.45 L/acre of 500 g/L formulations).
MCPA Ester (up to 0.45 L/acre of 500 g/L formulations)
The above tank mixes may reduce grass control, especially under adverse weather conditions.

In Canola:
Lontrel (0.17 to 0.34 L/acre).
Muster (8 to 12 g/acre).
Lontrel (0.17 L/acre) + Muster (8 g/acre) + Merge at 0.4 L/acre.

In Liberty Link canola only:
Poast Ultra (0.09 L/acre) + Liberty (1.08 L/acre)

In Field peas and CLEARFIELD canola:
Poast Ultra (0.19 L/acre) plus Merge (0.4 L/acre) may be tank mixed with the following herbicides:

Pursuit (40 mL/acre) to control: Chickweed, stinkweed, cleavers, volunteer canola (non-CLEARFIELD varieties), hemp-nettle (peas only), redroot pigweed (light infestations only), wild buckwheat (light infestations only) smartweed, wild mustard.

The company does not provide guidelines for weed densities under light infestations. When in doubt, use the higher rate below or contact the manufacturer.

Pursuit (85 mL / acre) for all weeds on the Pursuit label. Check label directions for mixing order and additional timing restrictions for broadleaf partners.

Allow 4 days between application of Poast Ultra and application of herbicides other than those registered for tank mixing. Allow 5 days between application of Sencor and Poast Ultra. Allow 14 days for regrowth when applied in sequence with a grass control herbicide.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Poast Ultra label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 1 hour of application may reduce control.

Grazing: Do not graze the treated crop or cut for feed prior to crop maturity. Forage legumes may be cut after the specified preharvest interval.

Preharvest Interval: Forage legumes - 30 days; Dry peas & flax – 60 days; Lentil & chickpea - 65 days; Canola, chickling vetch & alfalfa – 70 days; Mustard – 76 days; Potatoes, dry beans, soybeans, & fababeans – 80 days; Buckwheat – 85 days; Solin – 86 days; Safflower – 90 days; Sunflower 105 days.

Recropping: Do not sow cereal or grass crops within 14 days of Poast Ultra application.

Aerial Application: May be applied by air in 10 to 20 L / acre of water. Merge should be added at rates of 0.10 to 0.20 L / acre.

Storage: May be frozen.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

PrePass

Herbicide Group – 2,9
(Refer to page 27)

Company:

Dow AgroSciences

Formulation:

Each case of PrePass contains 2 components:

PrePass A (PCP#27395): 50 g / L florasulam formulated as a suspension concentrate.

PrePass B (PCP#27394): 360 g / L glyphosate IPA salt formulated as a solution.

Container sizes: PrePass A - 1.6 L, PrePass B - 2 x 10 L.

Crops and Staging:

PrePass can be applied either in the fall or in the spring prior to seeding either spring wheat (including durum), barley or oats.

Weeds Controlled and Staging:

Grasses at the 2 to 4 leaf stage:

- Downy brome
- Green foxtail
- Persian darnel
- Volunteer barley
- Volunteer wheat
- Wild oat

Broadleaf weeds controlled at the 2 to 4 leaf stage:

- Canada fleabane**
- Common chickweed
- Cleavers
- Dandelion seedlings
- Flixweed
- Hemp-nettle
- Lamb's-quarters
- Narrow-leaved hawk's-beard**
- Ragweed (common)**
- Redroot pigweed
- Russian thistle
- Shepherd's-purse
- Stinkweed
- Smartweed (including Lady's-thumb)
- Volunteer canola (all varieties)
- Volunteer flax
- Wild buckwheat*
- Wild mustard

Broadleaf weeds suppressed:
Annual sow-thistle Perennial sow-thistle***
Kochia

* up to 5 leaf stage.
** up to 8 cm in height.
*** better results from earlier applications.

Cost (2006 suggested retail price):

$6.83 per acre.

Rate:

PrePass A: 0.04 L (40 mL) / acre.
PrePass B: 0.5 L / acre.

One case treats 40 acres.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13 of the Guide to Crop Protection.

Application Information:

Water Volume: 20 to 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Use nozzles capable of delivering appropriate pressures and volumes.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

PrePass A: Warm, moist growing conditions promote active weed growth and enhance activity. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and re-growth may occur.

PrePass B: Best results are achieved when temperatures are near 20°C and when weeds are actively growing. Frost that kills more than 40% of above ground tissue will reduce control. Heavy dust layer on leaves will also reduce control.

Tank Mixes:

None registered.

Restrictions:

Rainfall:
PrePass A: No rainfast period is specified for this product; required interval may be up to 8 hours. Contact the manufacturer for more information.
PrePass B: Heavy rainfall immediately after application may wash the chemical off the foliage. Do not apply if rainfall is forecast for the time of application. Contact manufacturer for more information.

Grazing: Do not graze treated crop or cut for feed within 7 days of application.

Pre-harvest: Leave 60 days between application and harvest.

Recropping: Spring wheat (including durum), barley and oat, may be seeded after application or the field may be fallowed. Barley, canola, field peas, oat and wheat, may be grown the following season (10 months following an application).

Aerial Application: Do not apply by air.

Storage: Store in dry, heated area. If frozen, bring to room temperature and agitate before use.

Environment: Leave a buffer zone of at least 30 m between the downwind edge of the boom and the closest edge of sensitive terrestrial areas such as shelterbelts, hedgerows and shrub lands. A buffer zone of at least 5 m is required between the downwind edge of the boom and the closest edge of aquatic areas such as ponds, streams, rivers, prairie potholes and sloughs.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Caution Irritant, may cause eye irritation.

Prestige

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences

Formulation:

Prestige A (PCP#25465): 180 g/L fluroxypyr.
Container size – 6.4 L.

Prestige B (PCP#25464): 50 g/L clopyralid and 280 g/L MCPA ester. Container size – 2 x 8.0 L.

Both are formulated as an emulsifiable concentrate.

Crops and Staging:

Spring wheat (including durum), barley and canaryseed* from the 3 leaf stage until flag leaf emergence,

Forage Grasses* (seedling and established) grown for seed production applied at the 4 leaf to flag leaf stage:
Bromegrass (meadow, smooth)
Fescue (creeping red, tall)
Timothy
Wheatgrass (crested, intermediate)

* NOTE: Since these uses are registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Users of this product on forage grasses and canary seed do so at their own risk.

Weeds and Staging:

Unless otherwise stated, the following weeds will be controlled if sprayed in the 2 to 4 leaf stage.

Annual sow-thistle
Canada thistle*
Chickweed**
Cleavers (1-4 whorls)
Common groundsel
Dandelion***
Flixweed***
Hemp-nettle (2-6 leaf stage)**
Kochia
Lamb's-quarters
Perennial sow-thistle*
Redroot pigweed
Round leaved mallow (1 to 6 leaf)
Russian pigweed
Scentless chamomile
Shepherd's-purse
Smartweed
Stinkweed
Stork's-bill (1-8 leaf)
Tartary buckwheat
Volunteer canola
Volunteer flax (1-12 cm)
Volunteer sunflower
Wild buckwheat (1-4 leaf)
Wild mustard

* Spray when 4 to 6 inches (10 to 15 cm) high. Season long control, with some regrowth in the fall.

** Suppression only. Spray as late as possible (within recommended stages) to ensure the majority of weed flushes have emerged.

*** Spring rosettes only.

Cost (2006 suggested retail price):

$14.63 per acre.

Rates:

Prestige A: Apply at 0.32 L per acre.

Prestige B: Apply at 0.8 L per acre.

One case of Prestige will treat 20 acres.

Application Information:

Water Volume: 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan nozzles tilted forward at a 45° angle.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

The activity of the Prestige is influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought or heat stress) or if heavy infestations exist.

Tank Mixes:

Herbicides:
In spring wheat (including durum) and barley:
Achieve Liquid (200 mL/acre) plus Turbocharge adjuvant.
Assert (0.53 to 0.65 L/acre) plus acidifier.
Puma^{120} Super (0.16 to 0.32 L/acre).

In spring wheat (including durum):
Horizon (93 mL/acre) plus Score adjuvant.
Everest (17.4 g/acre) plus recommended surfactant.

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the Prestige label only. For other possible mixes see the blue fold out chart inside back cover.

Adding ingredients in the correct order is critical for optimum performance.

Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours of post-emergent application may result in reduced weed control.

Grazing: Do not cut or graze treated fields of wheat or barley for 7 days after application. Do not cut treated forage grass fields for hay or forage. Do not graze treated forage grass fields.

Preharvest Interval: Do not harvest crop within 60 days of application.

Recropping: Wheat, oats, barley, rye (not under-seeded to forage legumes, clover or alfalfa), flax, canola, field peas* and mustard may be seeded the season following Prestige application.

*NOTE: Do not seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Dow AgroSciences representative or retailer for more information before seeding field peas following drought conditions in the previous year.

Do not seed legume forages or crops other than those listed above until the second season following the Prestige application.

Aerial Application: Do not apply by air.

Storage: Store product in original containers in a secure, dry, heated area. If the product is frozen, bring to room temperature and agitate before use.

Environment: This product contains elements that are toxic to aquatic organisms and can damage susceptible non-target plants. Leave a 15 metre buffer between the nearest sprayer pass to non-target areas and domestic, irrigation or natural water or other wetland areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Danger Poison.

Warning Eye Irritant.

Caution Skin Irritant.

Prevail Liquid

Herbicide Group – 1, 4
(Refer to page 27)

This product is a prepackaged tank mix of Prevail A (Achieve Liquid page 55) and Prevail B (Curtail M page 90). Information listed is restricted to Crop, Weeds, Rates and Cost. For other detailed information on the component products see the product pages listed above.

Company:

Dow AgroSciences.

Formulation:

The Prevail package contains 3 components:

Prevail A (PCP#27579): 400 g/L tralkoxydim formulated as a suspension concentrate. Container size - 4 L.

Prevail B (PCP#23526): 50 g/L clopyralid plus 280 g/L MCPA ester formulated as an emulsifiable concentrate. Container size - 8 L.

Prevail Adjuvant (PCP#23527): (Turbocharge). Container size - 4 L.

Crops and Staging:

Spring wheat (including durum) and barley at the 3 to 6 leaf stage.

Weeds and Staging:

Grasses:
Wild oats - 1 to 6 total leaves,to a maximum of 2 tillers.
Green foxtail - 1 to 5 total leaves, to a maximum of 1 tiller.
Persian darnel - 1 to 4 total leaves including tillers.
Optimum weed control and yield response occurs when weeds are removed before tillering.

Broadleaves:
Apply at the 1 to 4 leaf stage unless otherwise indicated:

Annual sow-thistle	Russian pigweed
Canada thistle*	Scentless chamomile✧
Common groundsel	Shepherd's-purse***
Dandelion***	Smartweed
Flixweed***	Stinkweed***
Kochia (suppression)✧	Tartary buckwheat
Lamb's-quarters	Wild buckwheat
Perennial sow-thistle**	Wild mustard
Redroot pigweed	Volunteer canola

* Season long control, some regrowth may occur in the fall. Apply after all the thistles have emerged and are between 4 inches (10 cm) and 6 inches (15 cm) tall but prior to early bud stage.
** Top growth control only.
*** Spring rosettes only.
✧ 2 to 4 leaf stage.

Cost (2006 suggested retail price):
$27.48 per acre.

Rate:
The Prevail package will treat 20 acres.

Refer to the product label for complete mixing instructions for this product and its mixes.

A general guide to mixing can be found on page 13.

Application Information:
Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: 80° or 110° flat fan nozzles. All strainer and nozzle screens must be 50 mesh or coarser.

Hazard Rating:
Caution Poison

Warning – Eye and Skin Irritant

Primextra II Magnum

Herbicide Group – 15, 5
(Refer to page 27)

Company:
Syngenta (PCP#25730)

Formulation:
400 g/L of s-metolachlor + 320 g/L of atrazine formulated as a liquid. Container size - 14 L.

Crops and Staging:
Corn - Preplant incorporated (PPI) or Pre-emergence if irrigated within 10 days of application.

Weeds and Staging:
Apply prior to the emergence of weeds. Weeds that have emerged prior to application will not be controlled.

American nightshade	Purslane
Barnyard grass	Ragweed
Buckwheat	Redroot pigweed
Eastern black nightshade	Smartweed
Green foxtail	Wild mustard
Lady's-thumb	Witchgrass
Lamb's quarters	Yellow foxtail
Prostrate pigweed	Yellow nutsedge*

* Herbicide must be incorporated for best control.

Cost (2006 suggested retail price):
$22.69 to $30.17 per acre.

Rates:

WEED POPULATIONS	RATE (L/ACRE)	ACRES TREATED PER 14 L CONTAINER
Light infestations	1.2	11.7
Medium infestations	1.4	10
Heavy infestations	1.6	8.8

Do not apply to soils with less than 1% or more than 10% organic matter.

Application Information:
Water Volume: 61 L per acre

Pressure: 30 to 45 psi (200 to 300 kPa).

Nozzles: Flat fan with 50-mesh nozzle screens.

Incorporation:

Incorporate using S-tine or C-tine cultivators or tandem disk. Do not incorporate deeper than 4 inches (10 cm).

To ensure that the product remains in the top 2 inches (5 cm) of soil, apply to a firm seedbed free of large clods or lumps. If using tandem disks, set disks to work the soil at a depth of 4 inches (10 cm) and operate at a speed of 4 mph (6 km / hr). If using an S-tine cultivator, set the implement to work the soil to a depth of 4 inches (10 cm) and operate at a speed of 6 mph (10 km / hr).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Extended periods of dry soil conditions may result in reduced weed control. Moderate rainfall after application will enhance activity. Heavy rainfall following application of Primextra II Magnum may dilute the metolachlor deeper than 2 inches (5 cm) and result in reduced weed control, particularly on light textured soils.

Tank Mixes:

Herbicides: None registered.

Fertilizers: May be tank mixed with liquid fertilizer for preplant incorporated applications. Conduct a compatibility test by performing a jar test prior to mixing the products in the tank. May be impregnated onto dry bulk fertilizers (except nitrate or superphosphate fertilizers).

Insecticides: None registered.

Note: The above mixes are those listed on the Primextra label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Moderate rainfall shortly after application will enhance activity. Heavy rainfall reduces weed control by leaching the chemical out of the top few centimeters of soil. Inadequate rainfall after application (within 10 days) will cause reduced weed control.

Grazing: Do not graze or cut corn for feed before ear emergence.

Recropping: This product contains Atrazine. All crops except corn and triazine-tolerant canola may be affected the year following the use of Atrazine. Other more sensitive crops may be affected two or more growing seasons after application.

Aerial Application: Do not apply by air.

Storage: Store in a dry place.

Environment: Do not mix or load this product within 30 m, or apply within 29 m, of any wells, lakes, streams, ponds, dugouts or sink holes.

Tank Cleaning:

Refer to page 14.

Hazard Ratings


Caution Poison

Caution - Eye Irritant

Potential Skin Sensitizer

Prism

Herbicide Group – 2
(Refer to page 27)

Company:

E. I. duPont Canada Inc. (PCP#23983)

Formulation:

25% rimsulfuron formulated as a dry flowable.
Container size - 480 g.

Crops and Staging:

Irrigated potatoes* prior to flower initiation.

Potato tolerance to Prism differs by variety. Limit first use of Prism to a small area of each variety prior to adoption as a field practice. Delay cultivation for 7 to 10 days after application.

* NOTE - Since applications to irrigated potato in western Canada has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to irrigated potato in western Canada is at the risk of the user.

Weeds and Staging:

WEED	STAGE
Barnyard grass Green foxtail Yellow foxtail Witchgrass	1 to 6 leaf stage, maximum 2 tillers
Quackgrass	3 to 6 leaf stage (less than 10 inches or 25 cm leaf extended).
Redroot pigweed Lamb's-quarters (suppression only)	4 to 6 leaf stage (less than 4 inches or 10 cm tall or across).

Cost (2006 suggested retail price):

$21.51 per acre (plus adjuvant).

Rates:

24 g / acre (one package treats 20 acres).

Add a recommended non-ionic surfactant such as Citowett Plus, Agsurf, or Agral 90 at 0.2 L per 100 L spray solution. Make only one application per growing season.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: a minimum of 40 L per acre.

Pressure: 25 to 40 psi (175 to 275 kPa).

Nozzles: Flat fan. 50 mesh screens or coarser.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Apply Prism when the temperature 24 hours before and after application is between 5°C and 28°C. Temperatures beyond this range increase the potential for crop injury. Rapid fluctuations in temperature will stress the crop (greater than a 20°C difference within 24 to 36 hours). Allow 48 to 72 hours for the crop to acclimatize before spraying Prism if severe temperature fluctuations occur. Crop injury may result if applications are made when potatoes are stressed by abnormally hot, humid, or cold weather conditions, frost, low fertility, drought, water saturated soil, compacted soil, previous pesticide applications, disease or insect damage. If potatoes have been injured by frost, wait 48 to 72 hours after normal growing conditions have resumed before applying Prism.

Warm, moist conditions after application promote good weed control with Prism while cool and / or dry conditions may reduce or delay activity. Weeds hardened off by cold weather or drought stress may not be controlled.

Tank Mixes:

None registered.

Restrictions:

Rainfall: Within 2 to 4 hours of application may reduce weed control.

Preharvest: Leave at least 30 days from application to harvest.

Grazing: Do not graze the treated crop or cut for hay.

Recropping: Spring barley, soybeans, white beans, red clover, sorghum, potatoes and field corn may be planted the year after application. Winter wheat may be planted 4 months after application. For all other crops, a field bioassay is recommended before planting.

Aerial application: Do not apply by air.

Storage: May be frozen.

Environment: Do not apply in areas where surface water from the treated area can run off to adjacent cropland, streams, irrigation water or wells. Leave a buffer of 10 m from the last spray pass and wetland areas or bodies of water. Leave a buffer of 5 m from the last spray pass and woodlots or shelterbelts.

Tank Cleaning:

Do not clean equipment near desirable trees or other plants. Do not contaminate water sources. Drain tank, hose down tank interior and flush clean water through hoses for a minimum of 5 minutes. Create a water-ammonia cleaning solution (1 L of minimum 3% household ammonia per 100 L water) in spray tank. Flush hoses and nozzles, and add water to fill tank. Circulate cleaning solution for 15 minutes, and flush through boom again. Wash nozzles and screens in cleaning solution in pail. Repeat above tank and hose cleaning procedure. Rinse system with clean water for 5 minutes. Prior to using sprayer for next application, flush system with fresh water for 5 minutes.

Refer to page 14 for additional information.

Hazard Rating:

Warning Eye Irritant

Puma^{120} Super

Herbicide Group – 1
(Refer to page 27)

Company:

Bayer CropScience (PCP#25864)

Formulation:

120 g/L fenoxaprop-p-ethyl formulated as an emulsifiable concentrate. Container sizes – 6.2 L, 99.3L

Crops and Staging:

Spring wheat (including durum) with 1 to 6 leaves on the main stem plus 3 tillers:

Barley† with 1 to 5 leaves on the main stem plus 2 tillers.

Perennial ryegrass seedlings* with 2 to 4 leaves**.

† Apply to barley only when tank mixed with a registered broadleaf product.

* Grown for seed only.

** NOTE: Since this use on perennial ryegrass seedlings was registered under the User Requested Minor Use Label Expansion (URMULE) program, the manufacturer assumes no responsibility for herbicide performance. Those who apply this use do so at their own risk.

Durum wheat, perennial ryegrass and barley may experience some initial, temporary stunting and yellowing that rarely results in yield loss. Injury is more likely under stress conditions (see Effect of Growing Conditions).

Treatment at the 3 to 4 leaf stage of cereal crops and weeds will maximize crop tolerance and weed control. Temporary crop injury such as shortening or discolouration may be observed after application. Such injury is more likely to occur in barley and also when Puma^{120} Super is applied outside recommended stages.

Weeds, Rates and Staging:

WEEDS	RATE (L/ACRE)	AREA (ACRES) PER 6.2 L	STAGE†
Green foxtail only	0.154	40	1 to 6 leaf stage up to emergence of 3rd tiller
Low wild oat infestations*	0.268	23.1	
Moderate-heavy wild oat infestations, barnyard grass, green and yellow foxtail	0.31	20	

†Apply at the 3 to 4 leaf stage for optimum control. Optimum weed control and yield response occurs when weeds are removed before tillering.

*Low wild oat rate for use on Wheat and Durum only, and when applied alone and not in a tank-mix.

Cost (2006 suggested retail price):

$8.89 to $17.78 per acre.

Application Information:

Water Volume:
Ground application: 23 to 45 L per acre.
Aerial application: A minimum of 14 L per acre.

Pressure:
Ground application: 40 psi (275 kPa)
Aerial application: 42 psi (300 kPa)

Nozzles:
Ground application: 80° or 110° flat fan nozzles tilted forward at a 45° angle. Do not use flood jet nozzles, controlled droplet application equipment or Sprafoil equipment.
Aerial application: Use a combination of nozzles and pressure for a coarse droplet size distribution (400-800 microns).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

DO NOT apply Puma[120] Super 2-3 days prior to, or following, temperatures of 3°C or lower as crop injury may occur. Under stressful conditions (hot / dry, waterlogging, disease or insect damage) or heavy crop canopy, early application will improve weed control.

Do not apply by air when both the temperature is greater than 25°C and the relative humidity is less than 30%.

Tank Mixes:

Herbicides:
In Spring Wheat, Durum Wheat and Barley:
NOTE: Do NOT apply Puma[120] Super alone in barley.
ALWAYS tank mix with a registered broadleaf herbicide.
2,4-D Ester LV 600 (0.28 L / acre), LV 700 (0.24 L / acre)
Ally (2 to 3 g / acre)
Buctril M (0.4 L / acre)
Buctril M (0.40 L / acre) + Refine Extra (2.7 g / acre)
Curtail M (0.6 to 0.8 L / acre)
Dichlorprop + 2,4-D (0.71 L / acre)
DyVel** (0.5 L / acre)
Express Pack** (40 acres / case rate)
Frontline** (40 acres / case rate)
MCPA Amine or Ester (0.34 L / acre)
Prestige (20 acres / case rate)
Refine Extra (8 g / acre)
Refine Extra (8 g / acre) + MCPA Ester (0.34 L / acre)
Spectrum** (20 acres / case rate)
Thumper (0.40 L / acre)
Triton C†* (40 acres per case)
Trophy* (20 acres per case)
Unity *** (40 acres / case rate)

In Spring and durum wheat only:
Attain (40 acres / case rate)
DyVel** DS (0.44 L / acre)
Lontrel 360 (0.17 L / acre)
Lontrel 360 (0.17 L / acre) + MCPA Ester (0.34 L / acre)*
Lontrel 360 (0.112 L / acre) + MCPA Ester (0.34 to 0.45 L / acre)*
Mecoprop-P* (2.2 to 2.8 L / acre)

† Not for use in malt barley.
* Use only at the high rate of Puma[120] Super.
** Use only at the green foxtail rate of Puma[120] Super.
*** Not registered for use in Manitoba.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Puma[120] Super label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Leave an interval of 7 days prior to application or 4 days after application of Puma[120] Super, when applying any pesticide that is not registered as a tank mix.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 1 hour may reduce control.

Grazing: Do not graze or cut cereal crops for hay, within 25 days of application. Do not graze or cut perennial ryegrass crop for hay within 65 days of application.

Preharvest Interval: Do not harvest within 65 days of application.

Recropping: No restrictions in the year after application. Only one application may be made per year.

Aerial Application: May be applied by air.

Storage: Do not freeze.

Environment: Leave 3 metres from the downwind edge of the spray boom to water or wetland areas by ground or air. Leave 10 metres by ground and 33 meters by air from the downwind edge of the boom to sensitive non-target land areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison.

Eye and Skin Irritant.

Pursuit

Herbicide Group – 2
(Refer to page 27)

Company:

BASF Canada (PCP#23844)

Formulation:

240 g/L imazethapyr formulated as a liquid.

Container size - 2 x 3.3 L jugs per case.

Crops and Staging:

CROP	STAGE
CLEARFIELD canola	Apply after the first leaf stage.
Dry beans (pinto, pink and red varieties only)	Up to and including the second trifoliate leaf stage
Soybeans (Manitoba only)	Up to and including the third trifoliate leaf stage
Field peas	May be applied up to the sixth above-ground node stage (6 true leaves).
Seedling alfalfa (forage or seed production)✧	Apply after the first trifoliate leaf stage.
Established alfalfa (seed production only)✧✧	Apply before alfalfa reaches 12 inches (30 cm) in height.
Chickling vetch grown for seed	Apply at the 5 -7 leaf stage.

✧ Apply only to seedling alfalfa that will remain in production for at least 3 years following application. Apply only once during the life of the alfalfa stand.

✧✧ Do not apply in the last year of established alfalfa stands.

Do NOT use in the brown or dark brown soil zones (except for use in dry beans and alfalfa under irrigated brown soils); rotational crops may be severely injured due to carryover in these soils.

Weeds and Staging:

In field peas and CLEARFIELD canola varieties. Apply up to the 4 leaf stage, unless otherwise indicated:

Chickweed
Cleavers
Green foxtail
Hemp-nettle*
Lamb's-quarters✧
Redroot pigweed
Shepherd's purse*
Smartweed
Stinkweed
Volunteer canola (not CLEARFIELD varieties)
Volunteer barley**
Volunteer wheat**
Wild buckwheat
Wild mustard
Wild oats (2 to 4 leaf stage)

In seedling and established alfalfa:

Common groundsel***✧
Green foxtail✧
Green smartweed ***
Lamb's quarters***✧
Redroot pigweed
Shepherd's purse***✧
Stinkweed
Volunteer canola (not CLEARFIELD varieties)
Wild mustard

In dry beans:
Hairy nightshade (up to 6 leaf stage)

* In field peas only.
** Suppression in CLEARFIELD canola only.
*** Seedling alfalfa only.
✧ Suppression

Cost (2006 suggested retail price):

$24.62 per acre.

Rates:

85 mL / acre (40 acres per jug).

A non-ionic surfactant with at least 80% active ingredient (Agral 90, Agsurf, Surf 92) should be added at a rate of 0.25 L per 100L of spray solution. Do not over apply Pursuit, as crop injury may result. Only one application may be made during the growing season.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 to 160 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Plants are under stress when conditions before or after application are very hot or cold, excessively dry or wet. During periods of stress, plants are not actively growing and reduced weed control or crop injury may result.

Tank Mixes:

None registered.

Note: There are no tank mixes listed on the Pursuit label. To check for other possible tank mixes see the blue fold out chart inside the back cover.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze or harvest seedling alfalfa within 14 days of treatment. Do not graze or harvest field peas for feed within 30 days. Do not graze other treated crops or cut for feed prior to crop maturity.

Preharvest Interval: Do not apply within 60 days of harvesting field peas or chickling vetch, within 70 days of harvesting CLEARFIELD canola, within 75 days of harvesting dry beans, or within 85 days of harvesting soybeans.

Recropping: Rotate to barley, spring wheat (not durum), lentils, alfalfa, field peas or CLEARFIELD canola the year following application. The manufacturer recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crop other than those listed above. However, yield losses within the test strips may not be noticed unless the yield can be compared to an untreated area seeded adjacent to the Pursuit-treated strip. In case of crop failure, only field peas or CLEARFIELD canola may be replanted in the year of application.

NOTE: Breakdown of Pursuit may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on recropping intervals (1-877-371-2273).

Aerial application: Do not apply by air.

Storage: Do not freeze. If the product is exposed to temperatures below 0°C, thaw the product completely and shake the container vigorously prior to use.

Environment: Do not apply within 15 m of shelterbelts, water bodies, wetlands, and woodlots.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Keep out of reach of children.

Pursuit Ultra

Herbicide Group – 1, 2
(Refer to page 27)

Pursuit Ultra is a prepackaged tank mix of Pursuit (Page 180) at 0.04 L/acre and Poast Ultra (Page 169). Information listed is restricted to Crop, Weeds, Rates and Cost. For other detailed information on the component products including restrictions see the product pages listed above.

Company:

BASF Canada

Formulation:

The Pursuit Ultra package contains:

Poast Ultra (PCP#24835): 450 g/L sethoxydim formulated as an emulsifiable concentrate.

Pursuit (PCP#23844): 240g/L imazethapyr formulated as a liquid.

Container size – 2 x (1.65L Pursuit + 7.7L Poast Ultra). Jugs are split internally and contain both Poast Ultra and Pursuit. Each split jug treats 40 acres.

Crops and Staging:

CLEARFIELD canola - after the 1 leaf stage.

Field pea - up to the 6th above ground node stage (six true leaves).

Do NOT use in the brown or dark brown soil zones as rotational crops may be severely injured due to carryover in these soils.

Weeds and Staging:

Grasses: at the 1 to 6 leaf stage:

Barnyard grass	Volunteer oat
Foxtail (green and yellow)	Volunteer corn
Quack grass*	Volunteer wheat
Persian darnel	Witchgrass
Proso millet	Wild oat
Volunteer barley	

Broadleaf weeds up to the 4 leaf stage:

Chickweed	Stinkweed
Cleavers	Volunteer canola (non-CLEARFIELD varieties)
Hemp nettle (peas only)	
Redroot pigweed**	Wild buckwheat**
Smartweed	Wild mustard

* Suppression
** Light infestations only

Rates:

Poast Ultra: 0.19 L/acre;
Pursuit: 40 mL/acre
(One split jug treats 40 acres).

Merge Adjuvant (sold separately): Merge must be used with Pursuit Ultra at a rate of 1.0 L of Merge per 100 L of the total volume of spray solution.

Cost (2006 suggested retail price):

$24.47 per acre.

Application Information:

Water Volume: 40 L per acre

Pressure: 40 psi (275 kPa)

Nozzles: Stainless Steel 80° or 110° flat fan nozzles tilted forward at a 45° angle.

Restrictions:

Adhere to all restrictions for the Poast Ultra and Pursuit components.

NOTE: Breakdown of Pursuit may be slowed or delayed by environmental conditions such as drought, excessive cold and/or acid soils (pH less than 6.5) resulting in an increased risk of injury to rotational crops. The most tolerant crops are CLEARFIELD canola and legume crops, then cereals. Contact manufacturer for additional information on recropping intervals (1-877-371-2273).

Refine Extra Toss-N-Go† / Refine SG

Herbicide Group – 2
(Refer to page 27)

† **Refine TNG is no longer manufacturer but some product may still remain in the distribution system. Refine Extra TNG may be removed from this page future editions.**

Company:

E. I. duPont Canada

Formulation:

Refine Extra TNG (PCP#22352)†: 50% thifensulfuron methyl plus 25% tribenuron methyl formulated as a dry flowable.
Container size - 4 water soluble bags (80 g each, total 320 g).

Refine SG (PCP#28285): 33.35% thifensulfuron methyl plus 16.65% tribenuron methyl formulated as a water soluble granule.
Container size – 486 g bottle.

Crops and Staging:

Apply from 2 leaf to the flag leaf stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions

Cereals:
Barley
Oats
Wheat (including durum, spring and winter)

Seedling or established forage grasses for forage or seed production:*
Bromegrass (meadow, smooth)
Creeping red fescue
Kentucky bluegrass**
Orchardgrass
Tall fescue
Wheatgrass (crested, intermediate, northern, pubescent, slender, streambank, tall, western)

*NOTE: Since the use of this product on forage grasses is registered under the User Requested Minor Use registration system, the manufacturer assumes no responsibility for herbicide performance. Users of this product on forage grass do so at their own risk.

** Established stands only.

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.

Weeds Controlled:
Annual smartweed (green smartweed, lady's-thumb)
Ball mustard
Chickweed (1 to 6 leaf)
Common groundsel
Corn spurry
Cow cockle
Flixweed
Hemp-nettle
Kochia (Group 2 resistant biotypes with Banvel II tank mix only)
Lamb's-quarters
Narrow-leaved hawk's-beard
Redroot pigweed
Russian thistle
Shepherd's-purse
Stinkweed
Tartary buckwheat
Volunteer canola (CLEARFIELD varieties with 2,4-D or MCPA mixes only)
Volunteer sunflowers
Wild buckwheat***
Wild mustard

*** Wild buckwheat controlled at the 3 leaf stage for Refine Extra TNG and at the 5 leaf stage for Refine SG.

Weeds Suppressed:
Canada thistle, sow-thistle (less than 6 inches (15 cm) tall or across and prior to budding)
Cleavers (1 to 3 whorls)
Round-leaved mallow (2 to 6 leaf)
Scentless chamomile
Stork's-bill (2 to 6 leaves)
Toadflax (less than 6 inches or 15 cm tall)

Cost (2006 suggested retail price):

Refine Extra TNG: $6.40 per acre†.

Refine SG: $6.53 per acre.

† No new Refine Extra TNG was supplied by the manufacturer in 2006, therefore the price of Refine Extra TNG is reflects the 2005 suggested price.

Rate:

Refine Extra TNG: 8 g / acre (one 320 g container treats 40 acres).

Refine SG: 12 g / acre (one 486 g container treats 40 acres).

Add Agral 90, Agsurf, or Citowett Plus at 0.2 L per 100 L of spray solution.

Refine Extra TNG and Refine SG may degrade if left in the sprayer for an extended period. Apply within 24 hours of mixing.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: Minimum 22 L per acre.

Pressure: 30 to 40 psi (210 to 275 kPa).

Nozzles: Flat fan nozzles with 50 mesh line strainers and screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not apply to wheat, barley or oats that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result.

Under certain conditions (heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day/night temperatures) lightening in crop colour and reduction in crop height may occur.

Kochia control may be reduced during stress conditions or if extremely heavy infestations exist.

Tank Mixes:

Do not mix with substances that contain boron or that release chlorine.

Herbicides:

Tank Mix Partner	CROPS				
	Spring wheat	Winter wheat	Durum	Barley	Oats
2,4-D amine or ester (0.34 to 0.45 L/acre)*†	✓	✓	✓	✓	
Assert (0.53 to 0.65 L/acre)	✓		✓	✓	
Assert (0.53 to 0.65 L/acre) + MCPA ester (0.28 to 0.45 L/acre)*	✓		✓	✓	
Attain (80 acres per case) †	✓			✓	
Axial (243 mL/acre) plus Adigor adjuvant♦	✓		✓	✓	
Axial (243 mL/acre) + MCPA Ester (0.23✧ or 0.28 L/acre) plus Adigor adjuvant ♦	✓		✓	✓	
Banvel II (44.5 mL/acre) †	✓			✓	
Curtail M (0.61 L/acre) †	✓			✓	
Everest (17.4 g/acre) + 2,4-D amine or ester (up to 0.45 L/acre)* †	✓				
Horizon (95 to 115 mL/acre) plus Score adjuvant	✓		✓		
Horizon (95 mL/acre) + Banvel II (44.5 mL/acre) plus Score adjuvant	✓				
Horizon (95 mL/acre) + MCPA ester (0.23✧ or 0.34 to 0.45 L/acre)* plus Score adjuvant	✓		✓		
Lontrel 360 (85 mL/acre) †	✓			✓	
Lontrel 360 (85 mL/acre) + 2,4-D ester* or MCPA ester* (0.34 L/acre) †	✓			✓	
MCPA amine or ester (0.23 ✧ or 0.28 to 0.45 L/acre)* †	✓	✓	✓	✓	✓
Puma[120] Super (0.16 to 0.31 L/acre)	✓		✓	✓	
Puma[120] Super (0.16 to 0. 31 L/acre) + MCPA ester (0.23✧ or 0.34 L/acre)*	✓		✓	✓	

* 500 g ai/L formulation.

† Tank mix requires the addition of a non-ionic surfactant.

♦ Tank mix combination for Refine Extra TNG only.

✧ Tank mix with 0.23 L/acre to control Clearfield canola at the 2 to 4 leaf stage.

Check the above tank mix partner(s) respective labels for additional staging and varietal restrictions.

Fertilizers: None registered. Do not mix soluble bags with liquid fertilizers.

Note: The above mixes are those listed on the Refine Extra or Refine SG labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall:
Refine Extra TNG: Rain within 4 hours may reduce control.
Refine SG: Rainfall of 1 inch (25 mm) or more beginning within 1 hour of application may reduce control.

Grazing: Must not be grazed or fed to livestock for 7 days after treatment.

Recropping: None the year after treatment. Canola, flax, lentils and alfalfa may be planted 2 months after an application of Refine Extra.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. May be frozen.

Environment: Leave a 15 meter buffer zone between last spray swath and sensitive wild life habitats such as shelterbelts, wetlands, sloughs and woodlots.

Tank Cleaning:

Refine Extra and Refine SG can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Refine Extra or Refine SG should be drained and flushed out immediately after use. The manufacturer recommends that sprayers used to apply this product be flushed twice with a water / ammonia rinse (1 L of 3% ammonia per 100 L of water). Ammonia does not deactivate the herbicide but makes it dissolve easier in rinse water to aid in removal. If these products have been mixed with emulsifiable concentrate formulations, the addition of a wetting agent (detergent) will also aid the cleaning process. All nozzles, screens and filters should be removed (including disassembly of multi-nozzle assemblies) and cleaned after applying this product. Rinse the tank, booms, hoses, and nozzles with clean water to complete the process.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Refer to page 14 for additional information.

Hazard Rating:

Warning – Eye and Skin Irritant

Refine M

Herbicide Group – 2, 4
(Refer to page 27)

This product is a prepackaged tank mix of Refine SG (page 183) and MCPA ester (page 155). Information listed is restricted to Crop, Weeds, Rates, Cost and Tank mixes. For other detailed information on the component products see the product pages listed above.

Company:

E. I. duPont Canada

Formulation:

Refine SG (PCP#28285): 33.35% thifensulfuron methyl + 16.65% tribenuron methyl; formulated as a water soluble granule.

MCPA ester (PCP#26161): 500g / L MCPA formulated as an emulsifiable concentrate.
Container size: Each case contains 2 split jugs that hold 486 g of Refine SG and 9.1 L of MCPA ester.

Crops and Staging:

Apply from full 3 leaf to the flag leaf stage.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions

Cereals:
Barley, Wheat (including durum) and Oat.

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.

Weeds Controlled:

Annual Smartweed (green smartweed, lady's-thumb)
Ball mustard
Chickweed (1 to 6 leaf)
Common groundsel
Corn spurry
Cow cockle
Flixweed
Hemp-nettle
Kochia
Lamb's-quarters
Narrow-leaf hawk's-beard
Redroot pigweed
Russian thistle
Shepherd's-purse
Stinkweed
Tartary buckwheat
Volunteer canola (including CLEARFIELD varieties)
Volunteer sunflowers
Wild buckwheat (up to 5 leaf)
Wild mustard

Weeds Suppressed:

Canada thistle, sow-thistle (less than 6 inches (15 cm) tall or across and prior to budding)
Cleavers (1 to 3 whorls)
Round-leaved mallow (2 to 6 leaf)
Scentless chamomile
Stork's-bill (2 to 6 leaves)
Toadflax (less than 6 inches or 15 cm tall)

Cost (2006 suggested retail price):

$ 7.95 per acre

The price on this product is set by the distributor AgricoreUnited.

Rate:

Refine SG: 12 g / acre.

MCPA 500 Ester: 0.23 L / acre.

Add Agral 90, Agsurf, or Citowett Plus at 0.2 L per 100 L of spray solution.

One split jug treats 40 acres.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: Minimum 22 L per acre.

Pressure: 30 to 40 psi (210 to 275 kPa).

Nozzles: Flat fan nozzles with 50 mesh line strainers and screens.

Tank Mixes:

Do not mix with substances that contain boron or that release chlorine.

Herbicides:

In spring wheat (including durum)
Horizon (95 mL / acre) plus Score adjuvant*

In spring wheat (including durum) and barley
Puma^{120} Super (0.16 or 0.31 L / acre)*

*No additional non-ionic adjuvant required

Check the above tank mix partners respective labels for additional staging and varietal restrictions.

Fertilizers: None registered. Do not mix soluble bags with liquid fertilizers.

Note: The above mixes are those listed on the Refine M label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Reflex* *(For use only in the Red River Valley of Manitoba)

Herbicide Group – 14
(Refer to page 27)

Company:

Syngenta (PCP#24779)

Formulation:

240 g/L fomesafen formulated as a solution.

Container size- 10L.

Crops and Staging:

Dry beans✧ in the 1 to 2 trifoliate leaf stage. For use in the Red River Valley of Manitoba only.

✧ NOTE - Since applications to beans in the Red River Valley has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to beans is at the risk of the user.

Weeds and Staging:

Broadleaf weeds controlled by Basagran at the 0.71 L/acre rate plus improved control of the following weeds up to the 4-leaf stage:

Cocklebur	Ragweed (common)
Eastern black nightshade	Redroot pigweed
Lady's thumb	Velvetleaf*
Lamb's-quarters	Wild mustard

* Suppression only

Cost (2006 suggested retail prices):

$8.52 per acre, not including cost of Basagran or adjuvant.

Rate:

Reflex is registered in the Red River Valley of Manitoba only as a tank mix at a rate of 235 mL/acre Reflex plus 0.71 L/acre Basagran plus Agral 90 at 1 L per 1000L of spray solution.

Application Information:

Water Volume: Minimum 81 L per acre. Increase water volume to 142 L per acre for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.

Pressure: 275 kPa (40 psi). Increase pressure to 420 kPa (60 psi) for fields with heavy weed densities or with weeds at the upper limit of their recommended stage.

Nozzles: Use nozzles capable of delivering appropriate pressures and volumes.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Weed control and crop tolerance may be reduced under certain stress conditions such as cold temperatures, excess moisture, drought and injury from hail or previous herbicide applications.

Tank Mixes:

Herbicides: Reflex is only registered for use in a Basagran tank mix. See Rates.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Restrictions:

Rainfall: Reflex is unaffected by rain falling 4 hours after application.

Grazing: Do not graze treated crop or cut for hay. There is insufficient data to support such use.

Preharvest: Leave at least 84 days from application to harvest.

Recropping: Winter wheat may be sown 4 months after application. Spring wheat, dry beans and field corn may be grown the year following an application.

Do not apply Reflex to any field more often than once every 2 years.

These recropping restrictions refer only to the Red River Valley of Manitoba. Use outside this is region is not registered as recropping options have not been determined.

Aerial Application: Do not apply by air.

Storage: No information on label.

Environment: Leave a buffer zone of at least 15 m between the last spray swath and the edge of sensitive terrestrial areas such as shelterbelts, hedgerows and shrublands as well as aquatic areas such as ponds, streams, rivers, prairie potholes and sloughs. Do not apply when winds are greater than 15 km/hr.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Warning – skin and eye irritant; potential skin sensitizer.

Reglone Desiccant

Herbicide Group – 22
(Refer to page 27)

Company:

Syngenta (PCP#26396)

Formulation:

240 g/L diquat formulated as a solution.
Container size - 10 L.

Crops and Staging:

Reglone is used to dry immature green material at top of indeterminent crops and green weeds to facilitate harvest. Reglone will not speed maturity of green crops. Treatment before the recommended stage can result in reduced yield and quality. Add 0.1 L of Agral 90 or Agsurf per 100 L of spray solution for all applications except those indicated.

CROP	STAGE	RATE (L/ACRE)	
		Ground	Aerial
Dry beans, soybeans	Crop has lost 80 to 90 percent of leaves and 80 percent of pods are yellow.	0.5 to 0.7 (use high rate for dense crop, heavy weed infestations)	0.7 to 0.9 (use high rate for dense crop, heavy weed infestations)
Flax, solin	75 percent of bolls brown		
Lentils	Lowest pods are light brown and rattle when shaken.		
Mustard	75 percent of seed has turned brown		
Canola*	60 to 75 percent of seed has turned brown.		
Peas	Bottom pods are ripe and dry, seeds detached from pods.		
Chickpeas✧	Plants yellow, pods mature, seeds changed colour and detached from pods.		
Sunflowers	Backs of sunflower heads and bracts are turning yellow and seed moisture is 20 to 50 percent.		
Potatoes (some top growth and/or some weeds)	Two weeks prior to harvest	0.7 to 0.9**	2 applications required. First application – 0.7 to 0.9 L/acre**. Second application (4 to 5 days later) at 0.5 L/acre
Potatoes (dense crop, heavy weed infestations)		1.4**	
Alfalfa, bird's -foot trefoil, red and white clover (for seed production only).***	Pods are ripe but before shattering. Harvest within 7 days.	0.7 to 1.1 (use high rates for dense crops, heavy weed infestations)	0.7 to 1.1 (use high rates for dense crops, heavy weed infestations)

* This product can cause shattering losses in canola. It should only be used on Argentine canola to assist in the harvest of a severely lodged crop.
** Use high rate for dense or immature vines.
*** Do not use on forage legumes that have been treated with a residual herbicide in the previous 12 months.
✧ Aerial applications to chickpea - 0.7 L/acre only.

Cost (2006 suggested retail prices):

$23.45 per L plus surfactant.

Application Information:

Water Volumes:
Ground applications: 91 to 222 L per acre. Use 222 to 445 L per acre on potatoes.
Aerial applications: 18 L per acre. Use the highest water volumes when crop canopy is heavy or if weed growth is dense.

Pressure:
Ground application: 200 to 275 kPa (30 to 40 psi).
Aerial applications: 150 to 200 kPa (22 to 30 psi).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Best results under cloudy conditions or in evening.

Shattering losses can increase if heavy winds, rain or hail occur after the crop has dried down.

Tank Mixes:

Herbicides: None registered.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: Fungicides may be added when applying Reglone to potatoes for vine killing.

Restrictions:

Rainfall: Within 15 minutes may reduce effectiveness.

Grazing: Crop residues remaining after harvest may be fed to livestock.

Preharvest Interval: Wait 4 to 7 days before harvesting lentil. Do not exceed 7 days to harvest when treating forage legumes. Wait at least 7 days before harvesting Lupins. Wait 7 to 10 days before combining canola and mustard, but do not wait longer than 14 days. Wait 15 to 20 days for sunflowers. Harvest flax and peas when sample tests dry.

Recropping: No restrictions the year after application.

Aerial Application: May be applied by air in a minimum of 18 L per acre water volume.

Storage: Do not freeze.

Environment: Do not apply by air where wetlands or other good wildlife cover are present. Leave a 15 m border around the edges of sloughs and other wildlife cover. Apply when wind is between 3.5 and 9 km/hr.

Tank Cleaning:

When finished spraying Reglone, rinse the sprayer out with clean water. Run through pump, lines and nozzles. Drain tank by spraying out on an untreated portion of a crop on which the product is registered, or by spraying on uncropped land. Refill sprayer with water and Agral 90, Agsurf at 0.6 L per 1,000 L spray solution. Run the solution through lines and boom. Spray out, then refill with clean water. Leave equipment standing overnight, then drain water out.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members are likely to frequent or walk.

Refer to page 14 for additional information.

Hazard Rating:


Caution Poison

Warning Skin Irritant

Potential Skin Sensitizer

Remedy EC

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences (PCP#26420)

Formulation:

480 g/L of triclopyr acid formulated as an emulsifiable concentrate. Container size - 2 X 10 L jugs.

Crops and Staging:

Pastures and rangeland. Staging is based on weed stage.

Weeds and Staging:

For best results, apply to the following weeds when leaves are fully expanded and plants are actively growing, until autumn coloration begins to appear. Single stem applications should not be used on woody species greater than 8 ft. (2.5 m) tall.

Woody plants controlled:

Alder	Chokecherry*	Pines*
Ash	Cottonwood	Poplar
Aspen	Dogwood	Red maple*
Basswood	Elderberry	Raspberry*
Beech	Elm*	Sumac
Birch	Hawthorn	Tamarack
Blackberry	Maples	Wild rose
Buckthorn	Oaks*	Willow
Cherry*	Poison oak	

* These species may require treatment at the higher rate and may need to be retreated the following year, particularly if the original treatment was made at the lower rate.

Non-woody annual and perennial broadleaved weeds controlled are:

Burdock	Field bindweed	Smooth bedstraw
Chicory	Lamb's-quarters	Vetch
Curled dock	Ragweed	Wild lettuce
Dandelion	Smartweed spp.	

Cost (2006 suggested retail price):

$28.00 per L.

Rate:

Ground application:
Broadcast foliar - Woody species: 1.6 to 3.2 L/acre.
Non-woody species: 0.4 to 1.62 L/acre
Single stem: mix 0.04 to 0.08 L per 10 L of spray solution.
Backpack (low volume foliar): 0.1 to 0.5 L per 10 L of spray solution.
Aerial application: 1.6 to 3.2 L/acre

Application Information:

Water Volume:
Broadcast foliar: Minimum 80 L per acre. Proper coverage is important for effective control. Even, uniform coverage, without gaps or pooling of droplets is preferred.
Single stem: Apply to the point of runoff.
Backpack (low volume foliar): Thoroughly wet foliage but not to runoff.
Larger Woody Species: For control of woody species larger than 8 ft. (2.5 m) the basal bark method of control can be used to apply small amounts of Remedy mixed in oil carrier (mineral oil or vegetable oil) directly to the bark of the trunk. Several methods can be used. See the label for directions on this use.
Aerial application: A minimum of 12 L per acre.

Pressure:
Broadcast foliar: Maximum 275 kPa (40 psi).
Nozzles: Use application equipment that provides even coverage of large droplets that are not prone to drift.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Avoid spraying if temperatures exceed 28°C.

Tank Mixes:

None registered.

Restrictions:

Rainfall: No rainfree period is specified on the label; required interval may be up to 8 hours. Contact the manufacturer for more information.

Grazing:
For lactating dairy animals:
Rates below 1.9 L/acre - treated areas may be grazed or harvested for greenfeed 14 days after treatment.
Label rates greater than 1.9 L/acre - restrict grazing or greenfeed for 60 days following treatment. Do not harvest treated area for hay for 60 days after treatment.

For other livestock:
Rates below 1.9 L/acre - There is no restriction on grazing or harvesting treated areas for greenfeed but do not harvest treated areas for hay for 7 days after treatment.
Label rates greater than 1.9 L/acre - restrict grazing and harvest for greenfeed or hay for 14 days following treatment.
If less than 25% of grazed area is treated, there is no grazing restriction for other livestock.
Remove all animals from grazing treated grass or consumption of treated hay at least 3 days prior to slaughter.

Aerial Application: May be applied by air.

Storage: Store above -2°C. If frozen agitate container before use.

Environment: This product is highly toxic to fish, aquatic crustaceans, and plants. Do not apply to water. Do not spray at the edge of wetlands, lakes, ponds, streams, rivers, and wetland wildlife habitats. Buffer zones are dependent on rate of application, method of application and boom height. Consult the product label for specific buffer zone requirements.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison.

Restore

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences

Formulation (18.3L Co-pack)

240 g/L Aminopyralid (PCP#28137): formulated as a solution. Container size – 3 L
2, 4-D Amine 600 (PCP#28271): 564 g/L 2, 4-D formulated as dimethylamine solution. Container size: 7.65L

Note: Limited availability through selected retail outlets.

Crops and Staging:

Rangeland and pastures.

Apply in spring or early summer.

Weeds, Rates and Staging:

Apply when weeds are young and actively growing in the vegetative stage.

Aminopyralid: Apply at 0.2 L per acre.

2, 4-D Amine 600: Apply at 1L per acre.

One case treats 15 acres.

Weed Controlled

Absinth wormwood*
Annual sow-thistle
Bluebur
Blue lettuce**
Bull thistle**
Burdock ***
Buttercup**
Canada thistle*
Canada goldenrod*
Cocklebur
Common plantain
Common tansy*
Curled dock***
Dandelion✧
Flixweed
Goat's-beard
Gumweed**
Hawkweed
Hoary cress**
Perennial sow thistle**
Peppergrass
Prickly lettuce
Ragweeds
Scentless chamomile*
Spotted knapweed*
Stinging nettle
Sweet clover
Western snowberry*

* Season long control.
** Top growth control.
*** Less than 4-leaf.
✧ Suppression.

Cost (2006 suggested retail price):

$26.00 per acre.

Application Information:

Water volume:
Ground application: 40 L per acre minimum.
Aerial application: 20 L per acre minimum

Pressure: Use the pressures that will give the lowest amount of drift while maintaining good pattern and coverage.

Nozzles: Use an approved drift control system that produces coarse droplets in a uniform pattern.

Drift of even small amounts of Restore into sensitive plants or areas where sensitive crops may be grown can cause injury. Do not apply under conditions prone to drift (i.e. high winds and temperature inversions).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Application should be avoided under conditions of drought or other environmental stress.

Tank Mixes:

None registered.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not allow lactating dairy animals to graze treated areas within 7 days of application. Withdraw meat animals from treated fields at least 3 days before slaughter. Do not harvest forage or cut hay within 30 days of application. Allow 3 days of grazing on an untreated pasture (or feed untreated hay) before transferring livestock to areas where sensitive broadleaf crops may be grown.

Recropping: If legumes are essential in a pasture, do not use Restore. Do not break up treated pasture and plant to sensitive broadleaf crops for at least 3 years after application of Restore.

Aerial Application: May be applied by air.

Storage: Store product in original, labelled containers in a secure, dry, cool area. Do not freeze.

Environment: This product is toxic to terrestrial and aquatic plants. Do not apply this product directly to fresh water habitats (lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands), estuaries or marine habitats. Apply this product well back from any water bodies to avoid contamination (Refer to product label and provincial regulations for buffer requirements). Heavy rains can move this product from its application site down slope toward sensitive areas. Do not load or mix near wells, dugouts or other water bodies. Contact the provincial environment department for permits to apply near water. The use of this product may result in contamination of groundwater particularly in areas where soils are permeable (e.g. sandy soils) and/or the depth to the water table is shallow. When applying by ground leave a 10 M buffer zone between the downwind side of the sprayer unit and sensitive non-target terrestrial and aquatic habitats. When applying by air leave a buffer zone between the downwind side of the aircraft and sensitive non-target terrestrial and aquatic habitats. The size of the buffer zone when applying by air varies depending on the spray droplet size and the type of aircraft (fixed wing vs. rotary wing). Consult the Restore label to determine buffer zone size when applying by air.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Warning Poison

Reward

Company:

Syngenta (PCP#26271)

Formulation:

Reward - 240 g/L diquat formulated as a solution.

Container sizes - 4 x 3.78L.

Use:

Control of water weeds such as coontail, duckweed, Canada water weed, pond weeds, and water milfoil in farm dugouts. Offers temporary control of certain species of algae.

Cost (2006 suggested retail prices):

$46.17 per L

Timing:
Mid-May through late June.

Rates:
Dugouts less than 5 feet (1.5 m) deep: Apply Reward at 7.4 L per acre.

At this rate, 2.2 L of Reward will treat a dugout that is 160 feet by 80 feet (49 m x 24.4 m).

Dugouts more than 5 feet (1.5 m) deep: Apply Reward at 10.0 to 11.8 L per acre.

At these rates, a dugout that is 160 feet by 80 feet (49 m x 24.4 m) will require 3.0 to 3.5 L of Reward.

Milfoil can be controlled in early stages by 3.7 L per acre.

Application:
Dilute 1 part Reward with 4 parts clean water.

Spray over the water surface.

How it Works:
Refer to Table 2 on page 29.

Restrictions:
Grazing: Do not use water for animal consumption for 24 hours after application.

Irrigation: Do not use water for irrigation for 5 days after application.

Domestic Use: Do not use water for human consumption for 5 days after application. Do not swim in water for 24 hours after treatment.

Storage: Do not freeze.

Environment: If weed growth is dense, protect fish by not treating more than one-fourth of dugout at a time.

Equipment Clean Out:
Refer to page 14.

Hazard Rating:

Caution Poison.

Potential Skin Sensitizer
Warning Skin Irritant

Rustler

Herbicide Group – 4, 9
(Refer to page 27)

Company:
Monsanto Canada Inc. (PCP#27200)

Formulation:
194 g/L glyphosate present as the isopropylamine salt. 46 g/L dicamba present as a solution.

Container sizes - 10 L, 115 L.

Crops and Staging:
Summerfallow.

Preseeding in spring on fields to be sown to wheat, barley, oats and rye.

May also be applied prior to sowing field corn in fields with more than 2.5% organic matter (do not use on sandy or sandy loam soils).

Rustler SHOULD NOT be applied prior to broadleaf crops such as lentils, peas, canola and flax due to the risk of injury.

Weeds, Rates and Staging:
Application should be made to emerged, actively growing weeds. Application at early growth stages generally provides the best results.

Annual grasses - Apply 1 L per acre between emergence and heading. For wild oat apply at the 1 to 3 leaf stage.

Downy brome	Volunteer cereals
Persian darnel	Wild oats
Green foxtail	

Annual broadleaves - Apply 1 L per acre up to 6 inches (15 cm) height unless otherwise indicated.

Cow cockle	Smartweed (including lady's-thumb)
Flixweed	Stinkweed
Kochia	Volunteer canola*
Lamb's-quarters	Wild buckwheat (1 to 4 leaf)
Redroot pigweed	
Russian thistle	Wild mustard

* NOT including Roundup Ready varieties.

Foxtail barley suppression- Apply 1.26 L per acre before initiation of the seed head.

Cost (2006 suggested retail price):

$6.24 to $7.86 per acre.

Application Information:

Water Volume: 20 to 40 L per acre water. Use of the lower water volume will improve control. Avoid the use of extremely hard water (greater than 700 ppm calcium or magnesium or high levels of iron).

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Reduced effectiveness may result if application is made to weeds that are drought-stressed, damaged by disease or insects. Poor control under cool, cloudy weather can occur. Dust on foliage can also cause reduction in control.

Tank Mixes:

Herbicides:
2,4-D Ester or Amine (0.23 to 0.34 L / acre)†* or (0.4 to 0.5 L / acre)†**

* to control volunteer RR canola up to 4 leaf stage
** to control RR canola up to 6 leaf stage.
† Rates listed based on 2,4-D 600 formulations. Multiply rates by 1.2 for 500 formulations and 0.85 for 700 formulations.

Restrictions:

Rainfall: Within 6 hours may reduce weed control. Heavy rainfall within 2 hours of application may require a repeat treatment.

Grazing: Do not graze treated areas or cut for feed.

Recropping: No restrictions in the season following treatment. Do not apply in fall or spring prior to broadleaf crops such as lentils, peas, canola and flax due to the risk of injury.

Aerial Application: Do not apply by air.

Storage: Store above 5°C.

Equipment: Do not mix, store or apply this product or spray solutions of this product in galvanized steel or unlined steel (except stainless steel) containers or spray tanks.

Environment: Maintain a minimum buffer zone of 15 m between the downwind edge of the spray boom and non-target plants or wetland areas or other open water. Apply only in light wind conditions. Do not spray when conditions are dead calm or when wind is gusty.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Caution Poison

Danger Corrosive to Eyes
Warning Skin Irritant
Potential Skin Sensitizer

Sencor

Herbicide Group – 5
(Refer to page 27)

Company:

Bayer CropScience

Formulations:

Sencor Solupak 75 DF (PCP#20968) : 75% metribuzin formulated as a dispersible granule. Container size - 2.5 kg (5 water soluble bags, 500 g each).

Sencor 75 DF (PCP#17242): 75% metribuzin formulated as a dispersible granule. Container size - 2.5 and 5 kg.

Crops, Rates and Staging:

CROP	APPLICATION TIMING	RATES (g/acre)
Barley	2 to 5 leaf stage.	80 to 152
Spring wheat (including durum)	2 to 5 leaf stage.	80 to 111
Winter wheat (Norstar only)	In late fall after tillers have developed (past the 3 leaf stage).	226 to 304
Peas (field and processing)*	Preplant incorporated (when tank mixed with Rival or Treflan EC)	Spring: 152 to 192 Fall: 190 to 223
Peas (field only)*	Postemergence -up to 6 inches (15 cm) of vine length. For short-statured, determinate flowering peas, apply at the early stages within this range.	111 to 152
	Split post-emergent applications**	First split application: 60 to 80 Second split application: 7 to 10 days later with rates within these ranges.
Lentils*	Single or split applications** to plants up to 6 inches (15 cm) of vine length. For maximum crop tolerance, apply at the 1 to 4 above ground node stage.	111
		First split application: 60 to 80 Second split application: 7 to 10 days later with rates within these ranges.
Chickpeas*	Up to 2.5 inches (6 cm) in height, when vines have 1 -3 above ground nodes. Note application past recommended growth stage may result in severe crop injury.	111
Potatoes (except Belleisle or Tobique)***	Preplant incorporated (with Eptam).	152 to 223
	Pre-emergence in sprinkler irrigation systems (apply only in a tank mix with Eptam 8-E)	152 to 223
Potatoes (except Atlantic, Belleisle, Eramosa, Tobique and red-skinned or early maturing varieties)***	Early postemergence (up to 4 inches or 10 cm in height).	151
Soybeans***	Preplant incorporated (tank mixed with Treflan EC).	111 to 223
Fababeans	Preplant incorporated (tank mixed with Treflan EC).	Spring: 111 to 223 Fall: 190 to 223

* DO NOT use on lentils, peas or chickpeas seeded less than 2 inches (5 cm) deep or in soils with less than 4 percent organic matter.

** Under certain field or weather conditions a split application may provide better weed control and crop tolerance than single applications. The first application should be made at the cotyledon to 2 leaf stage of the weeds. The second application should be made when a second flush of weeds have emerged or if weeds which were more advanced at the time of the first application have started to show regrowth. The split applications are normally 7 to 10 days apart.

*** Consult manufacturer or seed supplier for varietal tolerances to Sencor applications in soybean and potato.

Note: When Sencor is tank mixed with Trifluralin in peas, fababeans, and soybeans, refer to product label for maximum rates that can be applied on light textured soils.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds, Rates and Staging:

Post-emergence applications should be made when weeds are small – 2 inches (5 cm) in height or diameter.

Split applications (postemergence on lentils and peas) – 1st application at cotyledon to 2 leaf stage of weeds. 2nd application (if necessary) 7 to 10 days after the first.

Post-emergence at 81 g/acre:

Weeds controlled in spring wheat, barley, field pea and suppressed in lentil and chickpea:

Chickweed	Stinkweed
Green smartweed	Volunteer canola
Hemp-nettle*	Wild mustard
Lamb's-quarters	

Additional weeds controlled in spring wheat and barley only:

Lady's-thumb	Redroot pigweed

Post-emergence at 111 g/acre:

Weeds controlled in spring wheat, barley, potato, field pea, and suppressed in lentil and chickpea:
Weeds above plus:

Ball mustard	Hemp-nettle
Corn spurry	Tartary buckwheat

Additional weeds controlled in spring wheat and barley only:

Common groundsel	Wormseed mustard
Night-flowering catchfly	

Post-emergence at 152 g/acre in spring wheat and barley only:
Weeds above plus:

Henbit	Russian thistle

Post-emergence at 152 g/acre in potatoes only:
Weeds listed for peas above plus:

Lady's-thumb	Shepherd's-purse
Redroot pigweed	

Post-emergence at 226 to 304 g/acre in winter wheat controls:

Downy brome	Shepherd's-purse
Flixweed	Stinkweed

Preplant Incorporated in Fababeans, Lentils, Field Pea and Soybean:
Must be applied in tank mix with Treflan EC or Rival):

Chickweed	Lamb's quarters
Corn spurry	Stinkweed
Green smartweed	Volunteer canola
Hemp-nettle	Wild mustard

Plus weeds controlled by either Rival or Treflan EC.
* Use the high rate for best control.
** Suppressed only in lentils and chickpeas.

Cost (2006 suggested retail price):

$73.80 / Kg

Application Information:

Water Volume:
Preplant incorporated: 40 L per acre.
Post-emergence applications:
Cereals - 40 L per acre.
Lentils, peas, chickpeas - 70 L per acre.

Pressure: 30 to 40 psi (200 - 275 kPa).

Nozzles: Flat fan nozzles with opening no smaller than 8002 or TK2 with 50 mesh screens. For lentils, peas and chickpeas use nozzles no smaller than 8003 or TK3. Angle nozzles 45° forward.

Incorporation: All plant growth and stubble should be thoroughly worked into the soil before treatment. Apply directly to the soil surface. Two incorporations are required at right angles for thorough mixing. The first incorporation must be made within 24 hours of spraying. For fall applications, it is preferred that both incorporations be done in the fall. The second incorporation may be delayed until spring to conserve trash; however, both incorporations must be done the recommended depth.
Incorporate with a tandem disc, discer or field cultivator (Vibrashank type). Set equipment to work at a depth of 3 to 4 inches (8 to 10 cm). Operate disc implements at 4 to 6 mph (7 to 10 km / hr), cultivators at 6 to 8 mph (10 to 13 km / hr).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions

Crop height reductions or yellowing may occur if high temperatures occur within 48 hours of application. Cold, cloudy weather or frost within 3 days of application will also aggravate injury. If frost occurs, allow 4 to 5 days for crop to recover prior to applying Sencor. Heavy rainfall soon after application to peas, lentils and chickpeas can result in stand reduction on soils with less than 4 percent organic matter.

Tank Mixes:

Herbicides:

In spring wheat or barley:
Dicamba, Target, MCPA amine or 2,4-D amine.

In potatoes (preplant incorporated):
Eptam 8-E (Required).

In fababeans (preplant incorporated):
Treflan EC (Required).

In soybeans (preplant incorporated):
Treflan EC (Required).

In peas:
Treflan (PPI)
Rival (PPI).
Sencor 75 DF at 77 g / acre plus 0.19 L / acre MCPA sodium salt (300 g / L).

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Sencor label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Allow 5 days between application of Sencor and application of other pesticides.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 6 hours may reduce control.

Grazing: Do not graze treated cereal crops within 30 days of application, or peas and lentils within 70 days of application.

Preharvest Interval: Do not harvest barley, wheat or potatoes within 60 days of application. Do not harvest lentils, chickpeas, or field peas within 70 days of application. Do not harvest processing peas within 40 days of application.

Recropping: Preplant incorporated treatments may leave a residue in the soil that will affect succeeding crops when using higher rates of product. Do not seed canola, sunflowers, onions, celery, peppers, cole crops, lettuce, spinach, red beets, turnips, pumpkin, squash, cucumbers or melons the year after treatment. Fall seeded crops may be injured when seeded the same year as preplant or post-emergence applications of these products.

Aerial Application: No restrictions on label. Reduced weed control and increased crop injury can occur with aerial applications.

Storage: May be frozen.

Environment: Avoid drift onto sensitive plants and contamination of water or wetland areas.

Tank Cleaning:

Spray equipment must be thoroughly cleaned to remove traces of herbicide that might injure other crops to be sprayed. Drain any remaining spray solution from the spray tank. Rinse the spray tank and refill with water, adding a heavy-duty detergent at the rate of 0.25 L per 100 L of water. Recycle this mixture through the equipment for 5 minutes and spray out. Repeat this procedure twice. Fill the spray tank with clean water, recycle for 5 minutes, and spray out. Clean pump and nozzle screens thoroughly. Wash away any spray mixture from the outside of the spray tank, nozzles or spray rig.

Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Refer to page 14 for additional information.

Hazard Rating:

Keep out of reach of children.

Shotgun

Herbicide Group – 4,5
(Refer to page 27)

Company:

United Agri Products (PCP#24608)

Formulation:

280 g/L atrazine and 120 g/L 2,4-D ester formulated as suspension concentrate.

Container size - 2 x 10 L.

Crops and Staging:

Field corn up to the 4 leaf stage.

NOTE: The 2,4-D component may cause corn to become brittle and prone to breaking from strong wind or cultivation for about two weeks following application.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled at the 1 to 6 leaf stage, unless specified:

Lamb's-quarters	Smartweed (annual)
Ragweed (common)	Wild buckwheat (1 - 4 leaf)
Redroot pigweed	Wild mustard

Cost (2006 suggested retail price):

$9.40 to 13.82 per acre.

Rate:

Broadcast applications:
Apply at 0.97 L per acre on light textured soils (sandy) and up to 1.46 L per acre on medium to heavy textured soils (silt to clay). One 10 L jug treats 6.8 to 10 acres.

Band applications:
Shotgun may also be applied in a band over the crop row if another method will be used to control weeds between rows. For band treatment, use proportionately less; for example, for 10 inch band on 30 inch row, use 1/3 of the broadcast rate over the total area covered by the sprayer.

Make only one application per year.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 to 81 L per acre.

Pressure: 35 to 40 psi (240 to 275 kPa)

Nozzles: Use flat fan nozzles that deliver a uniform coverage while minimizing fine droplets prone to drift. Banding applications require special even flat fan nozzles, designed to deliver an even spray pattern across the band. Use 50 mesh or larger screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

This product should be applied when the temperature is about 10° to 28°C for optimum results. Cooler temperatures delay or reduce its effectiveness and higher temperatures increase the risk of vapour movement to susceptible crops. Do not apply when there is a risk of severe fall in night temperature. Weed control and crop tolerance will be best when plants are not subjected to excessive moisture or drought stress before and after application.

If conditions are very dry, do not spray until one week after rain.

Tank Mixes:

Herbicides:
Accent (13.5 g/acre) plus recommended adjuvant.
Ultim (13.5 g/acre) plus recommended adjuvant.
– Manitoba only.

Fertilizer: None registered.

Insecticides: None registered.

Fungicides: None registered.

Do not add any other adjuvants, surfactants, oils, fertilizers or other pesticides to the spray mixture.

Note: The above mixes are those listed on the Shotgun label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Rainfall within 6 hours may reduce control. A 24 hour rainfree period is preferred.

Grazing: Do not harvest forage or graze fields until ear emergence of the corn.

Preharvest Interval: No information.

Recropping: Under good moisture conditions most rotational crops may be planted the season following application. When extended periods of dry weather occur during the year of treatment, injury may occur to dry beans, peas or other legumes.

Aerial Application: Do not apply by air.

Storage: Do not store below -10°C. If frozen, warm to 5°C or more and reconstitute by shaking or rolling container.

Environment: Avoid drift onto non-target areas. To avoid contamination, leave a buffer of 10 meters from the sprayed area to water bodies, wetland areas and plants that may be injured by Shotgun. Do not mix within 30 m of these areas. Do not spray near sensitive crops when winds are gusty or in excess of 8 km/h and moving towards sensitive crops.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison.

Danger Eye Irritant.
Caution Skin Irritant.
Keep out of reach of children.

Simazine

Herbicide Group – 5
(Refer to page 27)

Company:

Syngenta (Princep Nine-T - PCP#16370)
United Agri Products (Simazine 480 - PCP#23181)

Formulations:

Princep Nine-T: 90% simazine formulated as a water dispersible granular. Container size – 5 kg.

Simazine 480: 500 g/L simazine formulated as a flowable liquid. Container size – 2 x10L.

Crops and Staging:

Established alfalfa or bird's-foot trefoil (Princep Nine-T only).

Do not use in year of seeding. Apply after final cut in fall until freeze-up. Do NOT apply to the same field more than three consecutive years. Residues may build up with yearly applications.

Established shelterbelts (elm, caragana, green ash, Manitoba maple). - fall or early spring before weeds begin growth. Injury may occur to shelter belts growing under saline conditions.

Do NOT apply to frozen ground.

Weeds and Staging:

Simazine is applied prior to the emergence of the weeds and kills them when they are exposed to the treated layer of soil.

Barnyard grass
Lamb's-quarters
Perennial species starting from seed
Purslane
Ragweed
Smartweed (including lady's-thumb
Volunteer clovers
Wild buckwheat
Wild oats
Yellow foxtail

Cost (2006 suggested retail prices):

Princep Nine-T – $16.80 per kg

Simazine liquids – $11.36 per L

Rates:

Forage crops:
Princep Nine-T – 0.45 kg/acre.

Shelterbelts:
Princep Nine-T – 2 to 3 kg/acre.
Simazine 480 – 3.64 to 5.46 L/acre.

Application Information:

Water Volume: Minimum 121 L per acre. In shelterbelts, use a minimum of 202 L per acre.

Pressure: 30 to 45 psi (200 to 300 kPa).

Nozzles: Flat fan nozzles with 50 mesh or coarser nozzle screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

When applying to forage stands, dry soil conditions at the time of weed emergence may result in reduced weed control.

Tank Mixes:

None registered.

Note: The above mixes are those listed on the simazine labels only. For additional mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Moderate rainfall after application enhances activity.

Grazing: In forage stands, allow 30 days between application and grazing, 60 days between application and cutting for feed.

Recropping: Simazine is persistent and residues may persist for several years depending on soil pH, available soil moisture, number of yearly applications, and the sensitivity of the following crop. Corn will tolerate soil residues of simazine and may be planted the year of application.

White beans, onions, peas may be injured 12 month after application.

Aerial Application: Do not apply by air.

Storage: May be frozen. Store in a cool, dry place.

Environment: Do not use within 10 m of wells, wetlands, or other open water. Do not mix within 30 m of these areas.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison. (Simazine 480)

Solo

Herbicide Group – 2
(Refer to page 27)

Company:

BASF Canada (PCP#25496)

Formulation:

70% imazamox as a water dispersible granule.

Container size - 4 x 117 g water soluble bags.

Crops and Staging:

Field peas - 1 to 6 above-ground nodes (1 to 6 true leaves).
CLEARFIELD canola - 2 to 6 leaf stage.

Temporary crop yellowing may be observed shortly after application in field peas and CLEARFIELD canola.

Weeds and Staging:

Grasses - 1 to 4 main stem leaves, early until tillering.

Barnyard grass	Volunteer oat
Green foxtail	Volunteer wheat
Persian darnel	(not Clearfield varieties)
Volunteer barley	Wild oat
Volunteer canaryseed	Yellow foxtail

Broadleaf Weeds - cotyledon to 4 leaf stage.

Cleavers*	Shepherd's-purse
Cow cockle	Stinkweed
Green smartweed	Volunteer canola (not
Kochia*	CLEARFIELD varieties)
Lamb's–quarters	Wild buckwheat*
Redroot pigweed	Wild mustard

* Suppression.

Rates:

Solo: 11.7 g / acre (40 acres per case)

Merge Adjuvant (sold separately): Merge must be used with Solo at a rate of 0.5 L of Merge per 100 L of total mixed spray solution.

Do not apply Solo more than once per year. Refer to the product label for complete mixing instructions for this product and its mixes.

A general guide to mixing can be found on page 13.

Cost (2006 suggested retail price):

$25.17 per acre.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan. Use 50 mesh or coarser filter screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

No information provided on the product label. Plants are under stress when conditions before or after application are very hot or cold, or excessively dry or wet. During periods of stress, plants are not actively growing and reduced weed control or crop injury may result.

Tank Mixes:

None registered.

Restrictions:

Rainfall: Do not spray if there is a forecast of rain during or soon after application as it may reduce control.

Grazing: Do not graze treated crop or cut for feed within 20 days of application.

Preharvest Interval: Do not apply within 60 days of harvest.

Recropping: Canaryseed, canola, field peas, flax, lentil, oat, barley and spring wheat (including durum) may be seeded the first spring after application. The company recommends that a field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above. Contact manufacturer for additional information on recropping intervals (1-877-371-2273).

Aerial Application: Do not apply by air.

Storage: Do not freeze. Store in a cool, dry place above 5° C.

Environment: Avoid spraying in situations where drift may occur. Leave a buffer zone of at least 11 m between the outside boundary of the sprayed area and sensitive areas such as shelterbelts, hedgerows, wetlands, woodlots, vegetated ditch banks, ponds, streams, and sloughs.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Warning Eye and Skin Irritant

Spectrum

Herbicide Group – 2,4
(Refer to page 27)

Company:

Dow AgroSciences

Formulation:

Each case of Spectrum contains 2 components:

Spectrum A (PCP#27031): 50 g / L florasulam formulated as a suspension concentrate.

Spectrum B (PCP#27032): 50 g / L clopyralid and 280 g / L of MCPA ester formulated as an emulsifiable concentrate.

Container size- Spectrum A - 0.8 L, Spectrum B - 12 L.

Crops and Staging:

Spring wheat (including durum), barley and oats in the 2 to 6 leaf stage.

Weeds and Staging:

Broadleaf weeds controlled at the 2 to 4 leaf stage:

Canada thistle	Smartweed
Chickweed	Sow-thistle (annual)
Cleavers	Sow-thistle (perennial)†
Dandelion**	Stinkweed
Flixweed*	Stork's-bill
Hemp-nettle	Volunteer canola (all varieties)
Lamb's-quarters	Wild mustard
Redroot pigweed	Wild buckwheat
Shepherd's-purse	

Broadleaf weeds suppressed:
Dandelion***

* spring seedlings only.
** seedlings and overwintered rosettes < 15 cm.
*** overwintered rosettes > 15 cm; mature plants.
† top growth control only.

Cost (2006 suggested retail price):

$13.75 per acre.

Rate:

Spectrum A: 40 mL / acre

Spectrum B: 600 mL / acre

One case treats 20 acres.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13 of the Guide to Crop Protection.

Application Information:

Water Volume: 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Use nozzles capable of delivering appropriate pressures and volumes.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Warm, moist growing conditions promote active weed growth and enhance activity of Spectrum. Weeds hardened off by cold weather or drought stress may not be adequately controlled or suppressed and regrowth may occur. Under conditions of low crop and high weed density, control may be reduced. Extreme growing conditions such as drought or near freezing temperature prior to, at, or following time of application, may increase the risk of crop injury at all stages of growth.

Tank Mixes:

Herbicides:
In spring wheat (including durum) and barley:
Assert (0.65 L / acre) plus Acidulate.
Puma^{120} at 0.155 L / acre* or 0.31 L / acre.**

In spring wheat (including durum) only:
Everest (17.4 g / acre) plus non-ionic surfactant.
Horizon (93 mL / acre or 117 mL / acre) plus Score Adjuvant.**

* For control of green foxtail only
**This tank-mix may cause a reduction in wild oat control.

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Spectrum label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze treated crop or cut for feed within 7 days of application.

Pre-harvest: Do not apply within 60 days of harvest.

Recropping: Barley, canola, field peas*, oats and wheat may be grown the year following an application or the field can be summerfallowed.

* Do not seed to field peas for at least 10 months following treatment. Very dry soil conditions following application can result in a risk of injury to field peas grown in rotation. If severe drought conditions are experienced during the months of June to August inclusive in the year of application delay seeding field peas an additional 12 months (22 months following application). Contact your local Dow AgroSciences representative or retailer for more information before seeding field peas following drought conditions in the previous year.

Aerial Application: Do not apply by air.

Storage: Store in dry, heated area. If frozen, bring to room temperature and agitate before use.

Environment: Spray when winds are under 15 km / hr, but not dead calm. Leave at least 30 m between the downwind edge of the spray boom and the closest edge of non-target land areas such as shelterbelts, hedgerows and shrublands. Leave at least 5 m between the downwind edge of the boom and the closest edge of water and wetland areas such as ponds, streams, rivers, prairie potholes and sloughs.

Tank Cleaning:

Refer to page 14.

Hazard Rating:


Caution Poison

May cause eye irritation

Sundance*

Herbicide Group – 2
(Refer to page 27)

***Note Sundance is no longer manufactured, but stocks still remain in some retail outlets. Sundance may be removed from future editions of this publication.**

Company:

Monsanto Canada Inc.

Formulation:

Sundance (PCP#25826): 75% sulfosulfuron formulated as a water dispersible granule.
Container size – 432g per case.

Merge Adjuvant (PCP#24702): – 8 L.

pH adjuster: 7% ammonium hydroxide solution.
Container size: 4L jug.

Crop and Staging:

Spring wheat (including Avonlea, Kyle, Morse and Plenty durum) prior to emergence of the 4th tiller. (Do not underseed forage legumes).

Weeds and Staging:

Wild oat: From emergence to the 6 leaf stage with no more than 3 tillers. For optimum weed control and crop yield, apply prior to tillering.

Green foxtail*: emerged but prior to heading.

Annual Broadleaf weeds: cleavers, common chickweed, redroot pigweed, stinkweed, volunteer canola (NOT including CLEARFIELD canola), wild mustard - Apply to the seedling stage for optimum weed control.

Perennial Grass and Broadleaf weeds: dandelion**, foxtail barley, perennial sow-thistle**, quack grass* - Prior to heading/flowering when plants are actively growing

* Suppression only
** Spring seedlings are controlled and established plants are suppressed.

Cost (2006 suggested retail price):

$15.50 per acre including adjuvant.

Rates:

pH adjuster: 1 L per 400 L of spray solution.

Sundance: 11 g per acre (40 acres per case).

Merge: 0.2 L per acre.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 20 to 40 L per acre.

Pressure: 40 psi (275 kPa)

Nozzles: Flat fan. Choose nozzles that provide optimum spray distribution and coverage at the appropriate spray pressure. Do not use flood jet or controlled droplet application equipment.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

For optimum results, do not apply to weeds growing under stress.

Tank Mixes:

Herbicides:

2,4-D ester (500 g/L formulation) at 0.340 L/acre for additional control of lamb's-quarters, wild buckwheat, volunteer CLEARFIELD canola, stork's-bill, dandelion**, narrow-leaf hawk's-beard**, kochia, annual smartweed spp., and perennial sow-thistle**.

Pardner at 0.4 L / acre for additional control of weeds controlled by Pardner plus narrow-leaf hawk's-beard**.

MCPA ester (500 g/L formulation) at 0.385 L/acre for additional control of weeds listed on MCPA ester label plus narrow-leaf hawk's-beard***, wild radish, volunteer sunflower, common plantain, and wild buckwheat*.

Buctril M at 0.405 L/acre for additional control of those weeds listed on the Buctril M label plus dandelion**, hemp-nettle, velvetleaf, Canada thistle* and perennial sow-thistle*.

* Suppression only
** Control of spring seedlings and season-long control of established plants.
*** Spring seedlings only.

Fertilizers: None registered.

Insecticides: None registered.

Note: The above mixes are those listed on the Sundance label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance.

Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Do not apply if rain is forecast during, or soon after, application.

Grazing: Do not graze in the year of treatment.

Pre-harvest interval: No information available on label. Contact manufacturer for information.

Recropping:

Soils with GREATER than 4% organic matter:

Normal Moisture conditions	Wheat (including durum), canola (all varieties), barley, peas and flax may be grown the season after application.
Under Drought conditions*	Seed only wheat or Clearfield canola the season following application. The crops listed above can be seeded the second season following application.

Soils with LESS than 4% organic matter:

Normal Moisture conditions	Wheat (including durum), and Clearfield canola may be seeded one season after application. In the second season after application, barley, canola (all varieties), peas and flax may be grown in addition to the crops above.
Under Drought conditions*	Seed only wheat (including durum) or Clearfield canola for two seasons following application. Barley, canola (all varieties), peas and flax as well as the crops listed above can be seeded the third season following application.

* Drought conditions (less than 80% of normal June to Sept. rainfall) for high pH soils (greater than 7.5) and severe drought (less than 65% of normal June to Sept. rainfall) for all soils.

Re-seed only to wheat in the year of application. For all other crops, allow the most severe restriction for the soil and moisture conditions and conduct a field bioassay prior to planting.

Aerial Application: Do not apply by air.

Storage: Store under cool, dry conditions (below 50° C) away from foodstuffs, feed or seed.

Environment: Do not apply to water or contaminate water when draining sprayer. Maintain a buffer zone of 30m between the last spray swath and the edge of sensitive areas (shelterbelts, wood lots, or gardens). Leave a buffer zone of 6m between the last spray pass and wetlands or ponds. Use precautions to AVOID DRIFT. Drift may cause soil residues that will injure subsequent crops.

Tank Cleaning:

Do not drain or clean sprayer in an area where wastewater may drain into wells, other water bodies, or surrounding desirable vegetation. Flush tank, boom, and hoses with clean water for a minimum of ten minutes to remove all visible residues of the product. Fill the tank with water and add 1 L of household ammonia (minimum 3% ammonia content) per 100 L of rinse water and agitate. Flush solution through booms and hoses then top up tank with clean water. Agitate for 15 minutes, flush the hoses and booms again and then drain the tank. Remove nozzles and screens and clean separately with the ammonia solution as above. Repeat the ammonia rinse procedure as above. Thoroughly rinse the tank with clean water for at least 5 minutes, flush water through hoses and booms, and drain. Dispose of wash solution by spraying in a waste area or on the treated field.

For additional information, refer to page 14.

Hazard Rating:

Sundance: Slight skin irritant

 Merge adjuvant: Warning Poison; skin irritant

 pH adjuster: Caution corrosive

Tordon 22K

Herbicide Group – 4
(Refer to page 27)

Company:

Dow AgroSciences (PCP#9005)

Formulation:

240 g/L picloram acid present as a potassium salt, formulated as a solution.

Container size - 2 X 10 L jugs

Crop and Staging:

Apply at any stage of permanent grass pastures, rangeland and non-cropland.

Weeds, Rates and Staging:

For the control of biennial and deep-rooted perennial weeds listed below:

Weed	Rate L/Acre	Backpack (mL of Tordon 22K per 100 metres)*
Scentless chamomile	0.445	11
Knapweed (diffuse, spotted)	0.910	22
Canada thistle, pasture sage, poverty weed, Russian knapweed, perennial sow-thistle	1.8	45
Leafy spurge, field bind-weed, toadflax	3.6	90

* mix with 18 litres of water and the spray solution over 100 square metres.

For best results, applications should be made when perennial weeds have fully developed, green leaves. Application in late summer (or periods of dry weather) when plants are not actively growing may result in unsatisfactory control.

Cost (2006 suggested retail price):

$41.30 per L.

Only available through Dow AgroSciences trained agents. Contact Dow AgroSciences for further information.

Application Information:

Water Volume: 160 to 325 L per acre.

Pressure: 150 to 350 kPa (20 to 50 psi).

Nozzles: Flat fan recommended. Non-target broadleaf plants are very sensitive to picloram drift.

Avoid conditions that are conducive to drift. (See page 12 for drift control suggestions)

How it Works:

Picloram interferes with cell division, causing leaf cupping, stem distortion and eventual death. Picloram is absorbed through the leaves and roots.

IMPORTANT: Picloram is a very persistent and water-soluble herbicide. Treated soil should not be moved from the treated area. Do not apply to soils that are permeable, have sinkholes, or lie over limestone bedrock. Do not apply to soils whose surfaces are composed of fractured rock or unconsolidated gravel. Application to these sites may allow the movement of herbicide to underlying water sources or aquifers. If shallow aquifers are present, do not apply Tordon 22K.

Tordon 22K must not be applied on range and pasture acres that are irrigated. Do no compost or mulch clippings from grass treated with Tordon 22K.

Effects of Growing Conditions:

Avoid spraying if temperatures exceed 28°C.

Tank Mixes:

None registered.

Restrictions:

Rainfall: Rain within 6 hours of application may cause poor results. Heavy rainfall may dissolve and carry picloram away from the target area, or it may leach dissolved picloram out of the root zone or to undesirable locations.

Grazing: Do not graze lactating dairy animals within 6 weeks after treatment. There are no grazing restrictions for other livestock. Do not use manure from animals grazing treated forage to fertilize susceptible plants or crops.

Recropping: Tordon 22K may persist in the soil for up to 5 years. For this reason Tordon 22K may only be applied on permanent grass pastures and rangeland unless applied by an authorized pesticide applicator. Avoid the root zone of desirable trees or shrubs.

Aerial Application: Do not apply by air.

Storage: Do not freeze.

Environment: This product is moderately toxic to fish. Apply this product well back from any water bodies to avoid contamination. Heavy rains can move this product from its application site down slope toward sensitive areas. Do not load or mix near wells, dugouts or other water bodies.

Tank Cleaning:

Tordon 22K can cause severe injury to sensitive crops (especially pulses and other broadleaf crops) at very low concentrations. Spray equipment should be flushed out immediately after spraying Tordon 22K. The manufacturer recommends that equipment should be flushed twice with a water/household ammonia rinse (1 L of 3% ammonia per 100 L of water). All nozzles screens and filters should be removed and cleaned after use. Do not clean equipment upslope of water bodies or ditches near crop-land or shelterbelts.

Refer to page 14 for additional information.

Hazard Rating:


Caution Poison.

Danger Eye Irritant.

May Cause Skin Irritation.

Trifluralin

(Summerfallow use in the brown soil zone of Saskatchewan)

Herbicide Group – 3
(Refer to page 27)

Company:

Dow AgroSciences (Advance 10G, Treflan QR5)

Nufarm Agriculture (Rival 10G)

United Agri Products (Bonanza 10G)

Formulation:

Advance 10G (PCP#21742): 10% trifluralin formulated as a granular in 22.7 kg and 454 kg bags.

Bonanza 10G (PCP# 22744): 10% trifluralin formulated as a granular in 22.7 kg, 500 kg bags.

Rival 10G (PCP#18926): 10% trifluralin formulated as a granular in 22.7 kg, 567 kg bags.

Treflan QR5 (PCP#14545): 5% trifluralin formulated as a granular in 25 kg, 725 kg bags.

Crops and Staging:

Spring wheat (including durum) in the brown soils zone of Saskatchewan. Not for use in Manitoba.

Apply to summerfallow in May, June, or July for weed control during both years of a fallow-wheat rotation or in the fall (September or October) or spring prior to wheat seeding. Do not apply to stubble when the previous crop was treated with another trifluralin product (Treflan, Advance, Rival or Bonanza). This includes application the previous summer or fall. Do not apply trifluralin to stubble or fallow when the previous year's crop was an oilseed, barley or pulse crop treated with a deep incorporated, spring or fall applied trifluralin product.

Weeds and Staging:

The followed weeds will be controlled prior to emergence:

Fallow Year:

Green foxtail	Wild buckwheat
Wild oat†	Cow cockle
Persian darnel	Lamb's-quarters
Barnyard grass	Redroot pigweed
Russian thistle*	

Crop Year:

Green foxtail	Lamb's-quarters
Wild oat *	Wild buckwheat *

* Suppression only
† Suppression only with Advance 10G

Cost (2006 suggested retail price):

Advance 10G: $3.46 per kg.
Bonanza 10G: $3.06 per kg.
Rival 10G: $3.13 per kg.
Treflan QR5: $1.88 per kg.

Rates:

	RATE (KG/ACRE)			
	5G Formulations		10G Formulations	
Soil Organic Matter (%)	1 to 3	4 to 8	1 to 3	4 to 8
May	7.7	9	3.85	4.5
June	6.5	7.7	3.25	3.85
July	5.3	6.5	2.65	3.25
	2-8% Organic Matter			
September to October	4.5*		2.23*	
Spring (April or May, in the year of seeding)	4.5*		–	

* Control of green foxtail only, on soils between 2-6% organic matter.

During the fallow year, susceptible weeds may not be fully controlled until after the second fallow operation has established a uniform layer of treated soil. Control of wild oats in the crop year may be variable depending on wild oat population as well as soil and climatic conditions. Some wild buckwheat may escape but its growth will be retarded and result in limited competition to the wheat crop.

Application:

Do not apply to sandy soils with less than 1% organic matter. Application to severely eroded knolls is not recommended. Do not apply to wet soils, soils in poor working condition, soils which contain more than 8 percent organic matter, or soils subject to prolonged periods of flooding.

Granules may be applied to standing or pre-worked stubble, provided trash or green growth does not interfere with cultivation (prevent soil mixing).

Over-application caused by overlapping, improper calibration or non-uniform application may result in reduced crop stand, delayed development or reduced yields.

Close applicator lid after filling to avoid prolonged exposure to direct sunlight.

Incorporation:

May - July: Apply granules to the soil surface and incorporate immediately, in the same operation if possible. Do not delay incorporation more than 24 hours after application. Use a deep tillage cultivator, field cultivator or disc implement set to work 2 to 3 inches (5 to 8 cm) deep, and operating at 8 to 10 km/hr. A second incorporation at the same depth and at an angle to the first should be done when weed growth requires it. Wait at least one week before making the second incorporation. After completing two fallow incorporations, additional operations with a rod weeder, shallow tillage or fall 2,4-D application may be required to control remaining weed growth.

September - October: Apply granules after harvest until freeze-up and incorporate immediately, in the same operation if possible with a deep tillage cultivator, field cultivator or disc implement set to work 2 to 3 inches (5 to 8 cm) deep.

Do not delay incorporation more than 24 hours after application. A second incorporation may be done in the fall a minimum of 3 days later. Alternatively, in order to conserve trash cover throughout the winter, the second incorporation can be completed in the spring at the same depth and at an angle to the first incorporation. When both incorporations take place in the fall, shallow spring tillage should be completed in the spring. If a discer or air seeder is used for seeding, separate spring tillage may not be necessary.

Granules should not be incorporated when soil is crusted, lumpy or too wet for good mixing action. Fall application is not recommended on soils where a lack of trash cover combined with the required incorporation would leave the soil vulnerable to erosion.

Spring (April - May): Apply granules and incorporate immediately, in the same operation if possible. Do not delay the first incorporation more than 24 hours after application. The second incorporation must be delayed a minimum of 3 days following the first incorporation.

When applied to cold soils, wait 14 days before making second incorporation. The second incorporation should be done at an angle to the first incorporation, and at the same depth. If a discer or air seeder is used for seeding, the seeding operation can be used as the second incorporation.

Seeding:

Allow soil to warm before seeding to reduce risk of injury to crop. Place seed 1.25 to 2.5 inches (3 to 6 cm) deep. If spring seedbed preparation is required, set cultivator 2 inches (5 cm) deep. To reduce the risk of wheat injury, use good quality seed and agronomic practices that will promote good growing conditions. Avoid deep seeding, loose seedbeds and seeding into cold soils. If extended dry periods were present after a fallow application, a 10 percent increase in seeding rate is recommended.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Prolonged drought conditions after a May-July application to fallow may result in higher levels of trifluralin in the soil at the time of seeding. If conditions are not conducive to rapid emergence and growth of the wheat crop (for example cold or dry soil conditions) injury can occur.

Restrictions:

Rainfall: Once the product is incorporated into the soil, rainfall has no effect.

Grazing: Do not graze or cut for hay; insufficient data to support such use.

Recropping: Oats, canaryseed and small seeded forage grasses such as timothy and creeping red fescue should not be grown in rotation following a trifluralin treated crop.

Aerial application: Do not apply by air.

Storage: Store in a cool, dry location, out of direct sunlight.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Danger Eye Irritatant – Advance 10G

Keep out of reach of children.

Trifluralin (Green and Yellow Foxtail Control in Cereals)

Herbicide Group – 3
(Refer to page 27)

Company:

Dow AgroSciences (Advance, Treflan)
Nufarm Agriculture (Rival)
United Agri Products (Bonanza)

Formulations:

Advance 10G (PCP#21742): 10% trifluralin formulated as a granular in 22.7 kg and 454 kg bags.

Bonanza 10G (PCP#22744): 10% trifluralin formulated as a granular in 22.7 kg and 500 kg bags.

Bonanza 400 EC (PCP#21967): 400 g / L trifluralin formulated as an emulsifiable concentrate in 10 L, 115 L, 205 L containers.

Bonanza 480 EC (PCP#28289): 480 g / L trifluralin formulated as an emulsifiable concentrate in 9.45 L, 205 L containers.

Rival 10G (PCP#18926): 10% trifluralin formulated as a granular in 22.7 kg, 567 kg bags.

Rival EC (PCP#18612): 500 g / L trifluralin formulated as an emulsifiable concentrate in 9 L, 110 L, 200 L, 900 L containers.

Treflan EC (PCP#23933): 480 g / L trifluralin formulated as an emulsifiable concentrate in 9.45 L, 115 L containers.

Treflan QR5 (PCP#14545): 5% trifluralin formulated as a granular in 25 kg, 725 kg bags.

Crops and Staging:

Liquids applied in spring only (after seeding but prior to crop emergence) - spring wheat (including durum), barley.

Granulars applied in fall only (after September 1 but before freeze-up) - spring wheat (including semi-dwarf and durum).

Weeds and Staging:

Pre-emergent control of green and yellow foxtail.

Rates:

LIQUIDS

PRODUCT	RATES (L/ACRE)	
	LIGHT AND MEDIUM SOIL TEXTURE	HEAVY SOIL TEXTURE
Rival EC	0.49 to 0.57 L	0.65 L
Treflan EC, Bonanza 480 EC	0.49 L	0.69 L
Bonanza 400 EC	0.57 L	0.85 L

GRANULARS (WHEAT ONLY)

PRODUCT	RATES (KG/ACRE)
	All soils (2 -8% organic matter)
Advance 10G / Rival 10G / Bonanza 10G	2.23
Treflan QR5*	4.45

* Spring applications of Treflan QR5 may also be made at the same rate during the months of April and May only in soils between 2 to 6% organic matter.

Cost (2006 suggested retail prices):

Advance 10G: $3.46 per kg.
Bonanza 400 EC: $11.86 per L.
Bonanza 480 EC: N / A
Bonanza 10G: $3.06 per kg.
Rival EC: $13.83 per L.
Rival 10G: $3.13 per kg.
Treflan EC: $14.97 per L.
Treflan QR5: $1.88 per kg.

Application Information:

Water Volume: Minimum 40 L per acre -liquid formulations only.

Pressure: 40 psi (275 kPa) -liquid formulations only.

Nozzles: Flat fan -liquid formulations only.

Incorporation:

Liquid formulations: Apply and incorporate in spring just after seeding. Incorporate to a depth of 1 to 1.5 inches (2 to 4 cm) into a trash free soil (80 percent black when viewed from above) using diamond or tyne type harrows operated at a speed of 6 mph (9 km / h). Incorporate twice, with the second incorporation at right angles to the first. The first incorporation should be performed immediately in the same direction of application. Both incorporations should be done within 24 hours of application. When tank mixing liquid formulations with Avadex BW, follow the same incorporation procedure.

Granular formulations: May be applied to standing or preworked stubble. Very heavy trash fields should be worked prior to application to allow product penetration to the soil surface. Incorporate with cultivators or disc implements only. Perform the first tillage operation within 24 hours of application. Incorporate at a working speed of 5 to 8 mph (8 to 13 km / hr) and to a depth of 2 to 3 inches (5 to 8 cm). Wait a minimum of 5 days, then incorporate a second time at right angles to the first. This second incorporation may be delayed until the following spring. Subsequent working should be no deeper than 2 to 3 inches (5 to 8 cm).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

When using fall applications of the granular formulations, crop injury will occur if soil conditions are not conducive to rapid wheat emergence (for example, cold or dry soil conditions). Weed control is best when soil moisture conditions are good.

Rainfall has no direct effect on product activity. Flooding (3 to 5 days) will cause the rapid breakdown of the product, resulting in reduced weed control. Flooding for 3 weeks or more will result in total product breakdown and loss of weed control.

Tank Mixes:

Herbicides: None registered.

Fertilizer: Liquid trifluralin may be applied with liquid fertilizer (for example 28-0-0) as a carrier. Conduct a compatibility test before mixing.

Insecticides: None registered.

Note: The above mixes are those listed on the trifluralin labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: None. Flooding can reduce weed control.

Grazing: Do not graze the treated crop or cut for feed prior to crop maturity.

Aerial Application: Do not apply by air.

Recropping: Do not sow tame oats, canaryseed or small seeded forage grasses one year after spring applications or 21 months after fall applications.

Storage: Granular formulations must be stored in a cool, dry location, out of sunlight.
Rival EC - Do not store below 5°C.
Treflan EC - Do not freeze.
Bonanza 400 EC - Do not freeze.
Bonanza 480 EC -Do not freeze

Recommendations for liquid formulations: Crystalization of the active ingredient may occur at less than 5°C. To reconstitute, bring temperature to 15°C and shake well until no crystals are visible. This should be done before adding to the spray tank.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

 Warning Poison – Bonanza 480 EC

 Caution Poison – Bonanza 400 EC

Danger Eye Irritant – Advance 10G

Warning Eye and Skin Irritant – Bonanza 480 EC

Keep out of reach of children.

Trifluralin (Broadleaf and Grassy Weed Control)

Herbicide Group – 3
(Refer to page 27)

Company:

Dow AgroSciences (Advance, Treflan)
Nufarm Agriculture (Rival)
United Agri Products (Bonanza)

Formulations:

Advance 10G (PCP#21742): 10% trifluralin formulated as a granular in 22.7 kg and 454 kg bags.

Bonanza 400 EC (PCP#16929): 400 g/L trifluralin formulated as an emulsifiable concentrate in 10 L, 115 L, 205 L containers.

Bonanza 480 EC (PCP#28289): 480 g/L trifluralin formulated as an emulsifiable concentrate in 9.45 L, 205 L containers.

Bonanza 10G (PCP#22744): 10% trifluralin formulated as a granular in 22.7 kg, 500 kg bags.

Rival EC (PCP#18612): 500 g/L trifluralin formulated as an emulsifiable concentrate in 9 L, 110 L, 200 L, and 900 L containers.

Rival 10G (PCP#18926): 10% trifluralin formulated as a granular in 22.7 kg, 567 kg bags.

Treflan EC (PCP#23933): 480 g/L trifluralin formulated as an emulsifiable concentrate in 9.45 L, 115 L containers.

Treflan QR5 (PCP#14545): 5% trifluralin formulated as a granular in 25 kg, 725 kg bags.

Crops and Staging:

Certain formulations are not registered for all the crops listed here. Refer to the specific product label for details. All products are for pre-plant incorporated use only.

Spring applied liquid, dry flowable or granular formulations - canola, peas, sunflowers, safflower (liquid formulations), dry beans, mustard, fababeans, alfalfa, sainfoin, sweet clover, soybeans, forage legumes (cicer milk-vetch, seedling alsike clover, red clover, bird's-foot trefoil).

Fall applied granular formulations - canola, peas, sunflowers, dry beans, mustard, fababeans, soybeans, barley, lentils and flax.

Trifluralin liquids - prior to planting shelterbelt transplants (elm, caragana, green ash, Scots pine).

Weeds and Staging:

For pre-emergent control of the following species:

Annual brome species (downy, Japanese)	Lamb's-quarters
Barnyard grass	Persian darnel
Chickweed	Pigweed
Cow cockle	Purslane
Green foxtail	Wild buckwheat*
Knotweed	Wild oats†*
	Yellow foxtail

* Some plants may escape herbicide treatment but are not competitive with the crop.
† Suppression Treflan EC and Advange 10G only.

Costs (2006 suggested retail prices):

Advance 10G: $3.46 per kg.
Bonanza 400 EC: $11.86 per L.
Bonanza 480 EC: N/A
Bonanza 10G: $3.06 per kg.
Rival EC: $13.83 per L.
Rival 10G: $3.13 per kg.
Treflan EC: $14.97 per L.
Treflan QR5: $1.88 per kg.

Rates:

For use in canola, peas, sunflowers, dry beans, mustard, fababeans, seedling alfalfa (spring only), seedling sweet clover (spring only), soybeans.

PRODUCT	SOIL TYPE			
	Light soils with less than 6% organic matter		Medium to heavy soils with 6 to 15% organic matter	
	Spring	Fall	Spring	Fall
Advance 10G	Not registered	4.45 kg / acre	Not registered	5.67 -6.88 kg / acre
Rival EC	0.65 L / acre	0.89 L / acre*	0.89 -1.13 L / acre	1.13 -1.37 L / acre*
Rival 10G	3.43 kg / acre**	4.45 kg / acre	4.45 -5.67 kg / acre**	5.67 -6.88 kg / acre
Treflan EC	0.69 L / acre	0.93 L / acre*	0.93 -1.21 L / acre	1.21 -1.37 L / acre*
Treflan QR5	6.9 kg / acre**	8.9 kg / acre	8.9 -11.3 kg / acre**	11.3 -13.8 kg / acre
Bonanza 10G	Not registered	4.45 kg / acre	Not registered	5.67 -6.88 kg / acre
Bonanza 480 EC	0.69 L / acre	0.93 L / acre*	0.93 L / acre	1.17 L / acre*
Bonanza 400 EC	0.81 L / acre	1.11 L / acre*	1.11 L / acre	1.42 L / acre*

* Although liquid formulations are registered for fall application, this use is not recommended as tillage requirements before and after application will predispose fields to erosion.

** Spring applications of granular formulations are recommended for Manitoba only.

For use in barley (fall only), apply:

PRODUCT	SOIL TYPE					
	2 to 4% organic matter		4 to 6% organic matter		6 to 10% organic matter	
	Light Soil Texture*	Medium to Heavy Soil Texture**	Light Soil Texture*	Medium to Heavy Soil Texture**	Light Soil Texture*	Medium to Heavy Soil Texture**
Advance 10G	3.44 kg / acre	4.45 kg / acre	4.45 kg / acre	5.67 kg / acre	Not recommended	Not recommended
Rival 10G, Bonanza 10G	3.44 kg / acre	3.44 kg / acre	4.45 kg / acre	4.45 kg / acre	4.45 kg / acre	5.67 kg / acre
Treflan QR5	6.9 kg / acre	8.9 kg / acre	8.9 kg / acre	11.3 kg / acre	Not recommended	Not recommended

* Light textured soils can be defined as Sandy to Sandy-loam.

** Medium to Heavy textured soils can be defined as loam to clay.

Rates: continued

For use in flax or lentils (fall only), apply:

PRODUCT	SOIL TYPE			
	Soils with 2 to 6% organic matter		Soils with 6 to 15% organic matter	
	Light Soil Texture*	Medium-Heavy Soil Texture**	Light Soil Texture*	Medium-Heavy Soil Texture**
Advance 10G, Rival 10G, Bonanza 10G	4.45 kg / acre	4.45-5.6 kg / acre***	5.67 kg / acre	5.67 - 6.88 kg / acre
Bonanza 400 EC	1.11 L / acre	1.11 L / acre	1.42 L / acre	1.42 L / acre
Bonanza 480 EC	0.93 L / acre	0.93 L / acre	1.17 L / acre	1.17 L / acre
Treflan EC	0.93 L / acre	1.21 L / acre	1.21 L / acre	1.21 - 1.38 L / acre
Rival EC	0.89 L / acre	1.13 L / acre	0.89 L / acre	1.13 - 1.38 L / acre
Treflan QR5	8.9 kg / acre	11.3 kg / acre	11.3 kg / acre	11.3 13.8 kg / acre

* Light textured soils can be defined as Sandy to Sandy-loam.
** Medium to Heavy textured soils can be defined as loam to clay.
*** Rates vary among products. Refer to product label for specific information.

Application Information:

Water Volume: Minimum 40 L per acre (liquid products only).

Pressure: 40 psi (275 kPa) (liquid products only).

Nozzles: Flat fan (liquid products only).

Incorporation: Granular formulations are recommended for use in fall or spring as a pre-plant incorporated treatment on broadleaf crops listed on the product label. The liquid formulations should be used only on soils free of lumps and relatively trash-free (75% black) and are recommended only for spring use. Granular formulations may be applied to standing or pre-worked stubble. Very heavy trash fields should be worked prior to application to allow product penetration to the soil surface. Do not use liquid or formulations of trifluralin as a pre-plant incorporated treatment in barley, as severe injury will result. Only the fall applications of Advance 10G, Rival 10G, Bonanza 10G or Treflan QR5 are registered for use as pre-plant incorporated treatments in barley. For fall application of granular formulations, work the chemical into the soil between September 1 and freeze-up. Use a discer or field cultivator (vibrating shank-type). Disc implements are preferred on stubble. Set equipment to cut at 3 to 4 inches (8 to 10 cm) depth. The initial incorporation should be done within 24 hours of application.

The second incorporation should be done at right angles to the first. The second incorporation may be delayed until spring, except when planting barley, flax or lentils; for these crops both incorporations must be done in fall. Delay the second incorporation 5 days for better weed control. This will allow greater release of the chemical onto soil particles and assure more even distribution. Fall application of granular trifluralin on flax, lentils or barley is not recommended on soils prone to erosion, as the 2 fall incorporations necessary in these crops may leave soils vulnerable to wind or water erosion.

For spring application of liquid and granular formulations, work the chemical into the soil prior to seeding by setting the implement at 3 to 4 inches (8 to 10 cm) cutting depth. The first incorporation must be done within 24 hours of application. The second incorporation must be done at right angles to the first. If incorporating granular trifluralin, delay the second incorporation for 3 days after the first to achieve better weed control.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Injury to flax, barley or lentils may occur if soil and weather conditions are not conducive to rapid crop emergence (cold or dry soils at the time of seeding and crop emergence).

To minimize crop injury, seed into a firm, moist seed bed. Use a press drill or hoe-drill. Sow barley no deeper than 2 inches (5 cm). Sow lentils and flax no deeper than 1.5 inches (4 cm).

Less than acceptable weed control will result if dry conditions prevail at the time of weed emergence.

Rainfall has no direct effect on products' activity. Flooding (3 to 5 days) will cause rapid breakdown of the product resulting in reduced weed control. Flooding for 3 weeks or more will result in total breakdown of the product resulting in loss of weed control.

Tank Mixes:

Herbicides:
Fababeans:
Sencor 75 DF (Treflan EC only).
Peas:
Sencor (Treflan EC only).
Dry beans (white and red kidney only):
Eptam 8-E (Treflan and Rival liquids only).

Fertilizers: Liquid product may be applied with liquid fertilizer as a carrier. Before the herbicide is added to the tank, compatibility of the herbicide to liquid fertilizer should be tested following instructions on the herbicide container. Trifluralin liquids may be blended with dry bulk fertilizers (do not mix with nitrate fertilizers). Check label for blending instructions.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Trifluralin labels only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: None. Flooding may reduce weed control.

Grazing: Do not graze the treated crops or cut for feed prior to crop maturity.

Recropping: Oats, canaryseed, and small-seeded grasses may be affected the year after treatment. Corn is sensitive at higher rates of application. Damage to wheat can occur if the crop is seeded into land that has been treated during the previous 21 months with trifluralin products and has received abnormally low amounts of precipitation. Damage is worse if conditions are not conducive to rapid emergence of the wheat (for example, if the crop is seeded deep or if soil conditions remain cool during emergence). Damage tends to be greater on fields treated with granular formulations.

Aerial Application: Do not apply by air.

Storage: Granular formulations must be stored in a cool, dry location, out of sunlight.
Rival EC - Do not store below 5°C.
Treflan EC - Do not freeze.
Bonanza 400 EC - Do not freeze.
Bonanza 480 EC - Do not freeze.

Recommendations for liquid formulations: Crystalization of the active ingredient may occur at less than 5°C. To reconstitute, bring temperature to 15°C and shake well until no crystals are visible. This should be done before adding to the spray tank.

Tank Cleaning:

Refer to page 14

Hazard Rating:

 Warning Poison – Bonanza 480 EC

 Caution Poison – Bonanza 400 EC

Danger Eye Irritant – Advance 10G

Warning Eye and Skin Irritant – Bonanza 480 EC

Keep out of reach of children.

Triton C

Herbicide Group – 2 & 4
(Refer to page 27)

Company:

E. I. du Pont Canada Inc.

Formulation:

Component 1 (Refine Extra - PCP#22352): 50% thifensulfuron methyl plus 25% tribenuron methyl formulated as a dry flowable.

Component 2 (Accord – PCP#25118): 75% quinclorac formulated as a dry flowable

Container size: Component 1 - 320 g and Component 2 - 1.1 kg in a dual chambered jug.

Crops and Staging:

Spring barley (for feed only), wheat (including durum, and spring) - Apply from 2 to 5 leaf stage.

Do Not use on Leger barley or Belvedere wheat.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions

Weeds and Staging:

Unless otherwise noted below, apply to young and actively growing weeds that are less than 4 inches (10 cm) in height or width.

Weeds Controlled:

Annual smartweed (green smartweed, lady's-thumb)
Ball mustard
Chickweed (1 to 6 leaf)
Cleavers (1 to 3 whorls)
Common groundsel
Corn spurry
Cow cockle
Flixweed
Hemp-nettle
Kochia
Lamb's-quarters
Narrow-leaved hawk's-beard
Redroot pigweed
Russian thistle
Shepherd's-purse
Sow-thistle, annual
Stinkweed
Tartary buckwheat
Volunteer canola (not CLEARFIELD varieties)
Volunteer sunflowers
Wild buckwheat (1 to 3 leaf)
Wild mustard

Weeds Suppressed:

Canada thistle, perennial sow-thistle (less than 6 inches (15 cm) tall or across and prior to budding)
Round-leaf mallow (2 to 6 leaf)
Scentless chamomile
Stork's-bill (2 to 6 leaves)
Toadflax (less than 6 inches or 15 cm tall)

Cost (2006 suggested retail price):

$8.25 per acre.

Rate:

Component 1 (Refine Extra): 8 g per acre
Component 2 (Accord): 27 g per acre
One container treats 40 acres.

Merge adjuvant must be added at 1.0 L per 100 L of spray solution.

Refer to the product label for complete mixing instructions. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: Minimum 22 L per acre.

Pressure: 30 to 40 psi (210 to 275 kPa).

Nozzles: Flat fan nozzles with 50 mesh line strainers and screens.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Do not apply to wheat, or barley that are stressed by severe weather conditions (frost, drought or water saturated soil) as crop injury may result. Under certain conditions (heavy rainfall, prolonged cool weather, frost conditions, wide fluctuations in day / night temperatures) lightening in crop colour and reduction in crop height may occur.

Kochia control may be reduced during stress conditions or if extremely heavy infestations exist.

Tank Mixes:

Do not mix with substances that contain boron or that release chlorine.

Herbicides:
In spring wheat (including durum) and feed barley only;
Puma^{120} Super (0.31 L / acre up to 4 leaf stage only)*.
In spring wheat (including durum) only;
Horizon (93 mL / acre) plus Score adjuvant.

* Merge adjuvant is NOT required with this mix.

Fertilizers: None registered.

Note: The above mixes are those listed on the Triton label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: Within 4 hours may reduce control in general. Rainfall within 6 hours may reduce control of cleavers.

Grazing: Must not be grazed or fed to livestock for 77 days after treating wheat (spring or durum) or 80 days after treating barley.

Recropping: Spring wheat (including durum) and spring barley may be reseeded 2 months following Triton application. Wheat, barley, canola, field peas and sunflowers may be grown the year after application. Flax and lentils may be grown the second year after a Triton application. On low organic matter soils or under dry conditions, flax and lentils should not be grown until the third year after application. Do not use Triton on land where potatoes or vegetables are grown. A field bioassay (a test strip grown to maturity) be conducted the year before growing any crops other than those listed above.

Aerial Application: Do not apply by air.

Storage: Store in a cool, dry place. May be frozen.

Environment: Leave 15 metres between the downwind edge of the boom and sensitive areas such as shelterbelts, wetlands, sloughs, or wooded areas.

Tank Cleaning:

Triton can cause severe injury to sensitive crops at very low concentrations. Sprayers used to spray Triton should be flushed out immediately after Triton is used. The manufacturer recommends that sprayers used to apply this product be flushed twice with a water / ammonia rinse (1L of 3% ammonia per 100 L of water). All nozzles, screens and filters should be removed and cleaned after

applying this product. Rinse the tank, booms, hoses, and nozzles with clean water to complete the process. Do not clean equipment upslope of water bodies or ditches, near cropland or shelterbelts. Clean your sprayer away from areas where family members or others are likely to frequent or walk.

Hazard Rating:

Caution Poison (Accord)
Potential Skin Sensitizer (Accord)
Warning Eye and Skin Irritant

Trophy

Herbicide Group – 4
(Refer to page 27)

Company:

Nufarm Agriculture

Formulation:

The Trophy package has 2 components:

Trophy A (PCP#27246): 180 g / L fluroxypyr formulated as an emulsifiable concentrate.

Trophy B (PCP#27245): 500 g / L MCPA ester formulated as an emulsifiable concentrate.

Container size: Trophy A – 4.8L, Trophy B – 9L.

Crops and Staging:

Spring wheat (including durum), canaryseed* & barley - 3 leaf up to flag leaf fully emerged stage.

*Since the use of this product on canaryseed is registered under the User Requested Minor Use registration system, the manufacturer assumes no responsibility for herbicide performance. Users of this product on canaryseed do so at their own risk.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled at the 2 to 4 leaf stage, unless specified include:

Burdock
Cleavers (1 to 4 whorls)
Cocklebur
Flixweed
Hemp nettle (2 to 6 leaf)
Kochia
Lamb's-quarters
Mustards (except dog and tansy)
Prickly lettuce
Ragweed (common)
Redroot pigweed
Shepherd's-purse
Stinkweed
Sunflower (annual)
Vetch
Volunteer canola
Volunteer flax
Wild mustard
Wild radish

Weeds suppressed include:

Smartweed (green)
Stork's-bill (1 to 8 leaf)
Wild buckwheat (1-4 leaf)

Cost (2006 suggested retail price):

$10.45 per acre.

Rate:

Trophy A: 0.24 L per acre

Trophy B: 0.45 L per acre.

One case of Trophy treats 20 acres.
Make only one application per year.

Application Information:

Water Volume: Minimum 40 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Trophy activity is influenced by weather conditions. The temperature range for optimum activity is 12°C to 24°C. Reduced activity will occur when temperatures are below 8°C or above 27°C. Frost 3 days before or after application may reduce weed control and crop tolerance. Weed control may be reduced during stress conditions (drought, heat or cold stress) or if extremely heavy infestations exist.

Tank Mixes:

Herbicides:
In spring wheat (including durum) and barley:
Achieve Liquid (0.2 L / acre) plus Turbocharge adjuvant.
Assert (0.53 to 0.65 L / acre) plus pH adjuster.
Puma^{120} Super (0.31 L / acre).

In spring wheat (including durum):
Horizon (95 mL / acre) plus Score adjuvant.

Insecticides: None registered.

Fertilizers: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Trophy label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of products to be mixed for directions. General guidelines can be found on page 13.

Restrictions:

Rainfall: No rainfast period is specified on the label; required interval may be up to 8 hours. Contact manufacturer for more information.

Grazing: Do not graze, harvest forage or cut hay within 7 days of application.

Preharvest: Leave at least 60 days from application to harvest.

Recropping: Wheat, barley, oats, rye, forage grasses, flax, canola, mustard, lentils and peas may be grown the year after a Trophy application. There are no recropping restrictions the second year after application.

Aerial Application: Do not apply by air.

Storage: May be frozen. If frozen, bring to room temperatures and agitate before use.

Environment: Leave a 15 meter buffer zone between last spray swath and sensitive wild life habitats such as shelterbelts, ponds, wetlands, streams and woodlots.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

Danger Poison.

Warning Eye Irritant.

Caution Skin Irritant.

Ultim

Herbicide Group – 2
(Refer to page 27)

(For use only in Manitoba)

Company:

E. I. duPont Canada (PCP#24736)

Formulation:

37.5% rimsulfuron and 37.5% nicosulfuron formulated as a water dispersible granule. Container size – 134.8 g (4 x 33.7 g water soluble bags).

Crops and Staging*:

The following field corn hybrids at the 1 to 4 leaf stage:

Pioneer Brands 39K72, 39K73, 39W54, 39M27. For use in Manitoba only.

*NOTE - Since applications to corn in Manitoba has been registered under the User Requested Minor Use program, the manufacturer assumes no responsibility for herbicide performance. Application to corn is at the risk of the user.

Weeds and Staging:

No information is provided on the label for leaf staging. The manufacturer recommends the following staging:

Wild oats – 3 to 6 leaf stage.

Green foxtail, yellow foxtail, barnyard grass, volunteer cereals – 1 to 6 leaf stage (up to 2 tillers).

Quackgrass – 3 to 6 leaf stage (with extended leaf 4 to 8 inches long).

Redroot pigweed – 2 to 6 leaf stage.

Contact the manufacturer for additional weeds not listed on the label.

Cost (2006 suggested retail price):

$24.43 per acre

Rates:

13.5 g / acre.

One water soluble bag of Ultim will treat 2.5 acres (10 acres per container). Add a non-ionic surfactant (AgSurf, Agral 90, Citowett Plus) at 0.2 L per 100 L of spray solution. Apply Ultim within 24 hours of mixing, as product degradation may occur resulting in reduced weed control. Refer to the product label for complete mixing instructions.

Application Information:

Water Volume: Minimum 40 L per acre; for best results apply 56 to 77 L per acre.

Nozzles and Screens: Flat fan nozzles with 50 mesh or larger screens.

Effects of Growing Conditions:

Rapid fluctuations in temperature (greater than 20°C difference within 24 to 36 hours) will stress the corn crop. For maximum crop safety, allow 48 to 72 hours for the corn to acclimatize before applying Ultim.

Apply ONLY when the temperature in the 24 hours before AND after application is between 5°C and 28°C. Temperatures beyond this range increase the potential for crop injury. Separate applications of Ultim herbicide followed by a broadleaf herbicide (minimum 12 hours later) will reduce the potential for injury.

WARNING: Crop injury may result if application is made to corn that has been stressed by abnormally hot, humid or cold weather conditions, frost, low fertility, drought, water saturated soil, compacted soil, previous pesticide applications, disease or insect damage. If corn has been injured by frost, wait 48 to 72 hours before applying Ultim.

Tank Mixes:

Herbicides: None registered.

Insecticides: None registered. Ultim should NOT be applied to corn that has been treated with Counter, Cygard, Thimet, Lorsban, or Di-Syston. Leave 7 days between the application of Ultim and that of a foliar organophosphate insecticide.

Fungicides: None registered.

Note: The above mixes are those listed on the Ultim label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Restrictions:

Rainfall: Within 2 to 4 hours of application may reduce weed control.

Grazing: Do not graze treated crops or cut for hay.

Preharvest: Leave at least 30 days from application to harvest.

Recropping: Field corn, winter wheat and spring barley may be planted the year following Ultim application. Perform a field bioassay before planting any other crops, or where Ultim is more persistent (sandy soils, with low organic matter and pH greater than 7).

Aerial Application: Do not apply by air.

Storage: Store product in original containers in a secure, dry area, away from other pesticides, food, or feed.

Environment: Leave a 5 m buffer between the last spray path and woodlots or shelterbelts. Leave a 10 m buffer before wetland areas or water bodies.

Tank Cleaning:

Drain tank and hose down interior surfaces. Flush tank, hoses, boom, and nozzles with clean water for a minimum of 5 minutes. Fill spray tank with a water-ammonia cleaning solution (1 litre of minimum 3% household ammonia for every 100 L of water). Flush hoses, boom and nozzles with the cleaning solution, then add more water to completely fill the tank. Circulate for 15 minutes, then flush hoses, boom and nozzles with the cleaning solution, and drain the tank. Remove and clean the nozzles and screens separately in a bucket containing a cleaning solution as above. Repeat the above process and then thoroughly rinse the tank with clean water for a minimum of 5 minutes, flushing the water through the hoses and boom. Prior to using the sprayer for the next application, flush the tank, boom and hoses for 5 minutes with fresh water. Do not clean equipment where cleaning solution could flow towards water bodies, ditches, cropland, shelterbelts, or areas where people are likely to frequent or walk.

For additional information, refer to page 14.

Hazard Rating:

Warning – Eye Irritant

Caution – Skin Irritant

Unity

(For use only in Saskatchewan)

Herbicide Group – 2,6
(Refer to page 27)

Company:

Bayer CropScience

Formulation:

The Unity package contains two components:

Unity 280 EC (PCP#24497): 280 g/L bromoxynil formulated as an emulsifiable concentrate.

Unity 75 WG (PCP#24596): 75% triasulfuron formulated as a dispersible granule.

Container size - one case of Unity contains 2 x 4 L jugs of Unity 280 EC and 4 x 43 g water soluble bags of Unity 75 WG.

Crops and Staging:

Spring wheat (including durum), and barley - 2 leaf to just prior to flag leaf emergence. For use in the brown and dark brown soil zones of Saskatchewan only.

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Weeds and Staging:

Weeds controlled at the 2 to 4 leaf stage:

Chickweed	Lamb's-quarters
Cleavers	Redroot pigweed
Cow cockle	Shepherd's-purse
Flixweed	Stinkweed
Green smartweed	Wild buckwheat
Hemp-nettle	Wild mustard
Kochia	Volunteer canola
Lady's-thumb	

Caution:
Several crops are sensitive to low concentrations of Unity 75 WG in the soil. Therefore, careful consideration should be given to crop rotation plans prior to use. The Unity tank mix is registered for use in Saskatchewan in the brown and dark brown soil zones only. The degradation of Unity 75 WG in the soil is affected by rainfall, soil temperature and soil pH. If you are considering using this product, be sure to read the recropping restrictions outlined in the product label.

Cost (2006 suggested retail price):

$7.25 per acre.

Rates:

Unity 75 WG: 4.3 g per acre

Unity EC: 0.2 L per acre

One case treats 40 acres. Add a recommended non-ionic surfactant such as Citowett Plus, Agral 90, Agsurf, Super Spreader or Companion at 0.25 L per 100 L spray solution.

Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Application Information:

Water Volume: 40 L per acre.

Pressure: 40 psi (275 kPa).

Nozzles: Flat fan. 50 mesh screens or coarser.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Adequate control may not be achieved under unfavourable conditions such as drought, flooding or prolonged temperature extremes.

Tank Mixes:

Herbicides:
In Spring wheat (NOT including durum) and Barley:
2,4-D ester (0.34 L / acre – 500 g ai / L formulation)
Lontrel (0.11 L / acre)
MCPA ester (0.34 L / acre)

In Spring wheat (NOT including durum):
Puma^{120} Super (0.4 L / acre)

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

Note: The above mixes are those listed on the Unity label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Check labels of both products to be mixed for directions.

Restrictions:

Rainfall: Do not apply if rainfall is expected within 2 hours.

Grazing: Do not graze treated crops or cut for hay until 30 days after application.

Recropping: Some crops have shown a high sensitivity to low residues of Unity 75 WG in the soil. The risk of injury to rotational crops is affected by a number of factors including soil factors (soil type and soil pH), environmental factors (soil temperature, precipitation), crop species, and recropping interval. Breakdown of Unity 75 WG in soil is more rapid in high moisture, high temperature, and low pH soils.

To avoid injury to subsequent crops after an application of recommended rates of the Unity tank mix, the following recropping intervals outlined in the following table should be observed:

Recropping Restrictions:

CROP	MINIMAL INTERVAL (MONTHS)		
	Soil pH 6.4 or less	Soil pH 6.5 to 7.4	Soil pH 7.5 or greater
Spring wheat (hard red, Canada prairie, extra strong)	No Restrictions	No Restrictions	No Restrictions
Barley, oats, durum wheat	10	10	10
Flax	10	10	22
Peas	10	22	22
Canola	10	22	34
Canaryseed	22	22	22
Mustard	22	22	34
Lentils, sunflowers, all other crops	Bioassay	Bioassay	Bioassay

A field bioassay involves growing test strips of the crop(s) intended for production the following year in fields previously treated with the Unity tank mix. Crop response will dictate whether or not to rotate to the crop(s) used in the test strip. See Bioassay Guidelines section of product label. Apply the Unity tank mix only once per year to the same field.

Restrictions continued:

Aerial application: Do not apply by air.

Storage: Do not freeze.

Environment: Leave at least a 15 m buffer zone around wildlife habitat. Do not apply to irrigated land.

Tank Cleaning:

Unity can cause injury to sensitive crops at low concentrations. Clean sprayer immediately after use. Do not clean near desirable vegetation, wells or other water sources. Drain and flush tank and boom with water and household detergent. Add 1 L of 3% household ammonia for every 100 L of water to spray tank and agitate for 15 min. before flushing through nozzles. Wash nozzles and screens in the water/ammonia mix in pail. Rinse system with clean water for 5 minutes.

For additional information, refer to page 14.

Hazard Rating:


Warning Poison

Velpar DF

Herbicide Group – 5
(Refer to page 27)

Company:
E. I. duPont Canada (PCP#25225)

Formulation:
75% hexazinone formulated as a water dispersible granule
Container size: 2 kg.

Crops and Staging:
Established alfalfa for seed. Apply in late fall prior to freeze-up when alfalfa is dormant or in early spring before alfalfa growth resumes. Apply only on alfalfa that has been established for 18 months or longer. If burning or irrigation is to be carried out, do not apply until these operations have been completed. Do not apply to frozen ground.

Weeds, Rates and Staging:
Application stage is dictated by the crop above.

Apply at 0.272 kg/acre to control:
Dandelion Quackgrass
Sow-thistle

Apply at 0.544 kg/acre to control:
Narrow-leaved hawk's beard Scentless chamomile

Use the lower rate on medium-textured soils with low organic matter. Do not apply to soils with less than 1% organic matter.

Cost (2006 suggested retail price):
$23.39 to $46.78 per acre.

Application Information:
Water Volume: 81 L per acre.

Pressure: 30 to 40 psi (200 to 275 kPa).

Nozzles: Flat fan.

How it Works:
Refer to Table 2 on page 29.

Effects of Growing Conditions:
Adequate soil moisture is required for activation of the product.

Tank Mixes:
None registered.

Restrictions:
Rainfall: Rainfall is beneficial for activation of the product.

Grazing: Do not graze the treated crop or cut for feed.

Recropping: No crops should be seeded within 2 years of treating alfalfa with Velpar. A field bioassay is required after 2 years to determine which crops are safe to grow.

Aerial Application: Do not apply by air.

Storage: May be frozen.

Environment: Do not apply within 50 metres of water by ground.

Tank Cleaning:
Refer to page 14.

Hazard Rating:

Danger Corrosive


Caution Poison

Caution Skin Irritant

Venture L

Herbicide Group – 1
(Refer to page 27)

Company:

Syngenta (PCP#21209)

Formulation:

125g/L fluazifop-p-butyl formulated as an emulsifiable concentrate. Container size 2 x 8 L.

Crops and Staging:

Preharvest intervals must be followed to avoid unacceptable residues of fluazifop-p-butyl in harvested crops.

Crop	Crop Stage	Harvest Interval
Alfalfa	No restrictions	41
Bird's-foot trefoil and red clover	No restrictions	Do not graze or feed in year of treatment
Canola	Do not apply past 5th leaf	80
Creeping red fescue	2-5 leaf	For seed only
Flax, solin	No restrictions	80
Lentil	Do not apply past 6th node	70
Lupins	No restrictions	80
Mustard	Do not apply past 5th leaf	75
Peas	No restrictions	66
Potatoes	No restrictions	90
Soybeans	Up to 3rd trifoliate leaf	90
Sunflowers	No restrictions	120

When tank mixing, always check the tank mix partner recommendations for additional staging restrictions.

Cost (2006 suggested retail price):

$27.19 per L.

Application Information:

Water Volume: 20 to 81 L per acre.

Pressure: 30 to 60 psi (200 to 400 kPa).

Nozzles: 80° or 110° flat fan nozzles.

How it Works:

Refer to Table 2 on page 29.

Effects of Growing Conditions:

Less than acceptable weed control may be expected if weeds are under stress because of excessive moisture, drought, or cool weather.

Weeds, Rates and Staging:

Weed	Weed Stage	Rate (L/acre)	Acres per 8 L
Volunteer corn	2 to 5 leaf stage	0.24	33
Volunteer wheat and barley, Persian darnel, barnyard grass	2 to 5 leaf stage	0.32	25
Wild oats	2 to 5 leaf stage	0.40	20
Quackgrass suppression in canola and soybeans	3 to 5 leaf stage	0.40	20
Green and yellow foxtail	2 to 4 leaf stage	0.57	14
Quackgrass suppression (all crops)	3 to 5 leaf stage	0.80	10

Apply to annual grasses before tillering for best control.

Tank Mixes:

Herbicides:

In canola:
Muster (Argentine varieties only)
Lontrel

In alfalfa, bird's-foot trefoil & red clover:
2,4-DB

In creeping red fescue:
Ally

In soybean:
Basagran + Assist

In potato:
Sencor (reduced grass control from Venture L may result)

Fertilizers: None registered.

Insecticides: None registered.

Fungicides: None registered.

When applying other broadleaf herbicides in the same field, apply the product no sooner than 3 days after application of Venture.

Note: The above mixes are those listed on the Venture L label only. To check for other possible mixes see the blue fold out chart inside the back cover.

Adding ingredients in the correct order is critical for optimum performance. Refer to the product label for complete mixing instructions for this product and its mixes. A general guide to mixing can be found on page 13.

Restrictions:

Rainfall: Activity is not affected by rainfall if it occurs at least 2 hours after application.

Grazing: Do not graze crops or cut for hay in the year of treatment.

Preharvest Interval: See crop stage section.

Recropping: Seed only broadleaf crops listed on this label if seeding must occur within 60 days of application.

Aerial Application: Do not apply by air.

Storage: Product is not affected by temperatures below 0°C.

Environment: Do not apply within 15 m of fish-bearing waters and wildlife habitats.

Tank Cleaning:

Refer to page 14.

Hazard Rating:

 Caution Poison

Skin Irritant

Experimental studies have shown that the active ingredients in this product may cause birth defects in laboratory animals.

Women capable of bearing children should avoid contact with this product.

Special Weed Problems

This section identifies specific weeds and some herbicides recommended for control. Refer to the particular crop section or the product label for information on specific products that may be used on the crops and for application instructions.

Absinthe

2,4-D LV Ester (500 g/L) - In grass pastures with no legumes, spray 1.82 L / acre in late June, prior to flowering. Re-treat regrowth in late summer when plants have 6 to 10 inches (15 to 25 cm) of new growth. More than 1 season of treatment may be required.

Banvel II - In grass pasture and rangeland only, apply 0.5 L / acre in 20 to 30 gallons (90 to 135 L) per acre for top-growth control when leaves are fully expanded.

Alders

2,4-D LV Ester (500 g/L) - In grass pastures and non-crop land, apply 1.78 L / acre to the foliage of actively growing brush.

Banvel II + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply Banvel II at 2.1 L per 1,000 L of water with 2,4-D LV ester or amine at 4.0 L per 1,000 L of water to the foliage of actively growing brush in the spring or early summer and wet the foliage until the point of runoff.

Aspen Poplar (Trembling Aspen)

Banvel II + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply Banvel II at 1.32 L / acre with 2,4-D LV ester or amine at 1.78 L / acre in 20 gallons / acre (90 L / acre) water to the foliage of actively growing brush in spring or early summer.

Remedy EC - In grass pasture and rangeland apply 1.62 to 3.24 L / acre in 45 gallons / acre (200 L / acre) of water in broadcast treatment to fully expanded, actively growing foliage. Single stem foliar and backpack methods are also available - See Remedy section for details.

Baby's Breath (Perennial)

Banvel II - In grass pastures with no legumes, apply 3.72 L / acre in 10 to 20 gallons / acre (45 to 90 L / acre) water when actively growing.

Biennial Wormwood

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g / L) at 1.78 L / acre to the foliage of actively growing plants.

Black Medic

Bromoxynil+MCPA ester, /Dichlorprop+2,4-D,/Mecoprop, /dicamba+mecoprop+MCPA, /2,4-D amine or LV ester - Apply in registered crops at registered rates to black medic in the 1 to 4 leaf stage for suppression only.

Chokecherry

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g / L) at 1.78 L / acre to the foliage of actively growing brush.

Remedy EC - In grass pasture and rangeland apply 1.62 to 3.24 L / acre in 45 gallons / acre (200 L / acre) of water in broadcast treatment to fully expanded, actively growing foliage. Single stem foliar and backpack methods are also available - See Remedy section for details. May need the higher rates for control and retreatment the following year.

Common Tansy

Glyphosate - Apply at 1.9-2.8 L / acre in 10 gallons of water / acre (40 L / acre) to actively growing plants that are 8-10 inches (20-25 cm) tall (summerfallow, stubble and noncropland).

Escort - In pastures, rangeland and rough turf, apply 8 g / acre in 10 to 20 gallons / acre (45 to 90 L / acre) of water to actively growing plants of less than 4 inches (10 cm) tall. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Curled Dock

Banvel II - As a patch treatment or in pasture and rangeland, apply 0.92 L / acre Banvel II in 10 to 20 gallons / acre (45 to 90 L / acre) water to actively growing weeds for top growth control.

Glyphosate - As a spot treatment, apply 2.83 to 4.86 L / acre in 10 gallons / acre (45 L / acre) water when most plants have reached the early bud stage. Do not disturb treated plants for at least 10 days following treatment.

MCPA amine, 2,4-D amine - Apply 0.445 to 0.69 L / acre of formulations containing 500 g / L MCPA or 2,4-D amine to give top growth control.

Dichlorprop + 2,4-D - 0.71 L / acre for suppression before plants are 2 inches (5 cm) tall.

Remedy EC - In grass pasture and rangeland apply 0.4 to 1.62 L / acre in 45 gallons / acre (200 L / acre) of water in broadcast treatment to fully expanded, actively growing foliage. Backpack method is also available - See Remedy section for details.

Diffuse Knapweed

Banvel II - In grass pastures, rangeland and non-crop land, apply Banvel II at 1.86 L / acre in 10 to 20 gallons / acre (45 to 90 L / acre) water to actively growing weeds.

Tordon 22K - In rangeland and grass pasture, apply 0.91 L / acre in 90 to 180 gallons / acre (400 to 800 L / acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Downy Brome and Japanese Brome

Glyphosate - Prior to crop emergence, apply 0.51 to 0.77 L / acre in 5 to 10 gallons / acre (23 to 45 L / acre) water before downy brome is 6 inches (15 cm) in height.

Rustler - Prior to crop emergence, apply 1.0 L / acre in 5 to 10 gallons / acre (23 to 45 L / acre) water between emergence and heading of downy brome.

Trifluralin - Apply at recommended rates for weed control in broadleaf crops prior to emergence.

Field Bindweed

Banvel II - As a patch treatment or in rangeland, apply 1.0 L / acre Banvel II in 10 to 20 gallons / acre (45 to 90 L / acre) water. Apply when field bindweed is in the flowering stage and allow 3 weeks after treatment before resuming normal summerfallow tillage.

Basagran - In labelled crops, apply 0.71 L / acre followed by 0.71 L / acre 7 to 10 days later. Apply in 20 to 35 gallons / acre (90 to 160 L / acre) water before field bindweed has developed a dark green colour and before it has begun trailing. Use a recommended surfactant (see recommendations under the appropriate crop).

2,4-DB - As a spot treatment in labelled crops apply 2.83 to 4.86 L / acre in 10 gallons / acre (45 L / acre) water at the bud stage. Do not disturb plants for at least 10 days following treatment. Heavy rainfall within 2 hours of application may wash chemical off the foliage and a repeat treatment may be required. Rainfall occurring within 6 hours after application may reduce control.

2,4-D amine - In grass pastures containing no legumes or as a spot treatment, apply 1.82 L / acre of formulations containing 500 g / L 2,4-D amine at early flowering stage.

Glyphosate - As a spot treatment, apply 2.8 to 4.9 L / acre in 10 to 30 gallons / acre (45 to 135 L / acre) at the full bloom stage or beyond. Allow 7 or more days after application before tillage.

Remedy EC - In grass pasture and rangeland apply 0.4 to 1.62 L / acre in 45 gallons / acre (200 L / acre) of water in broadcast treatment to fully expanded, actively growing foliage. Backpack method is also available - See Remedy section for details.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L / acre in 90 to 180 gallons / acre (400 to 800 L / acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Field Horsetail

Amitrol 240 - Apply 5.0 to 6.7 L / acre in 10 to 30 gallons / acre (45 to 135 L / acre) water in non-cropped areas and pastures when the weed is young and actively growing.

MCPA amine, potassium and sodium salt mixtures - Apply 0.57 L / acre of formulations containing 500 g / L MCPA after the weeds have fully emerged for top growth control. May be used in wheat, oats, barley, flax and rye.

Foxtail Barley

Glyphosate - Prior to crop emergence, apply 1 to 2 L / acre in 5 to 10 gallons / acre (23 to 45 L / acre) water to foxtail barley at the seedling to heading stage. Late fall applications may provide better control of established plants than spring applications.

Glyphosate - In Roundup Ready canola, apply 2 applications, each at 0.5 L / acre, for season long control.

Gramoxone - Apply 2.23 L / acre in 98 gallons / acre (445 L / acre) water or 75 mL in 2.2 gallons (10 L) water / 1076 square feet (100 sq. m) for top growth control only.

Kerb 50-W - Apply 0.364 to 0.445 kg / acre product in 20 gallons / acre (90 L / acre) water between October 1 and freeze-up. Use the lower rate on grey-wooded soils or where perennial bluegrass or fescues are the predominant pasture species. Do not use Kerb for foxtail barley removal in seed grass stands or desired foliage stands of timothy or fescue grass species. At recommended rates, pasture stands of perennial bluegrass and fescue may be reduced by 10 to 15 percent. Where perennial bluegrass and fescues are the dominant pasture species, use the lower rate of Kerb. Spray overlaps may seriously harm desirable pasture grass species. Where the grass stand comprises mostly foxtail barley and reseeding to a desirable grass species is required, delay seeding into the Kerb-treated soil until the end of June. Do not harvest or graze within 60 days of application with Kerb. Avoid using Kerb on soils having more than 6 percent organic matter.

Rustler - Prior to crop emergence, apply 1.26 L / acre in 5 to 10 gallons / acre (23 to 45 L / acre) water to foxtail barley before initiation of the seed head for suppression only.

Sundance - Apply at 11 g / acre in 5 to 10 gallons / acre (23 to 45 L / acre) water prior to flowering.

Goat's-Beard

2,4-D amine - Apply 0.91 L / acre of formulations containing 500 g / L in early fall or early spring.

Dichlorprop + 2,4-D - Apply 1.62 L / acre in early spring or fall.

Banvel II - In grass pasture and rangeland only, apply 1.86 L / acre in 20 to 30 gallons (90 to 135 L) per acre when leaves are fully expanded.

Gumweed

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 0.89 L/acre to the foliage of actively growing plants.

Hemp Dogbane

2,4-D amine or LV ester - Apply 1.38 to 1.82 L/acre of formulations containing 500 g/L 2,4-D in fall before frost and while plant leaves are green.

Glyphosate - Apply 2.83 to 4.86 L/acre when hemp dogbane is in the early bud stage. Apply in 10 gallons/acre (45 L/acre) water. Do not disturb treated plants for at least 7 days after application.

Hoary Cress

Amitrol 240 - For non-selective patch treatment in pastures and non-crop land, apply 8.9 to 13.8 L/acre.

Glyphosate - As a spot treatment in labelled crops, apply 2.83 to 4.86 L/acre in 10 to 30 gallons/acre (45 to 135 L/acre) water when most plants have reached the early bud stage. Do not disturb treated plants for at least 10 days following treatment.

Leafy Spurge

Amitrol 240 - Apply 15.2 to 18.5 L/acre in 10 to 30 gallons/acre (45 to 135 L/acre) water in non-cropped areas and pastures when the weed is between the late stages of flowering and early seed development.

Banvel II - Apply 0.84 L/acre Banvel II in 10 to 20 gallons/acre (45 to 90 L/acre) water for top growth control when the weed is actively growing. Patch treatment or pasture.

2,4-D amine - Apply 1.82 L/acre of formulations containing 500 g/L 2,4-D at early flowering stage. Repeat at least once to new growth later in the season. Control of established plants and new seedlings will require continued applications for a period of at least 4 to 5 years.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L/acre in 90 to 180 gallons/acre (400 to 800 L/acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Locoweeds, Lupines, and Milk-vetches

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.78 to 2.75 L/acre at the full bloom stage.

Remedy EC - To control vetches in grass pasture and rangeland apply 0.4 to 1.62 L /acre in 45 gallons/acre (200 L/acre) of water in broadcast treatment to fully expanded, actively growing foliage. Backpack method is also available - See Remedy section for details.

Milkweed

Amitrol 240 - Apply 7.6 to 11.3 L/acre in 10 to 30 gallons/acre (45 to 135 L/acre) water in non-cropped areas and pastures in the early summer when all the shoots have emerged.

Glyphosate - When making preharvest applications, use 1.0 L/acre. For patch treatments, apply 4.86 L/acre in 10 gallons/acre (45 L/acre) water. Apply when most plants have reached the bud to bloom stage. Reduced results may occur on plants treated after full bloom as not all milkweed plants reach the required stage of growth at the same time. Repeat treatments may be required. Do not disturb plants for 10 days following treatment. Do not apply to plants covered with dust.

Narrow-leaf Hawk's-beard

2,4-DB - Apply to forage legume crops at recommended rates at the 2 to 4 leaf stage of narrow-leaf hawk's-beard, after legume growth in the fall has stopped.

2,4-D LV ester (500 g/L) - In fall stubble, apply 0.57 to 0.90 L/acre to fall rosettes.

Express Pack - In registered crops and summerfallow, apply at registered rates to spring seedlings less than 4 inches (10 cm) across or to fall rosettes.

Glyphosate - Prior to crop emergence, apply 0.51 to 0.77 L/acre in 5 to 10 gallons/acre (23 to 45 L/acre) water. Use the high rate if narrow-leaf hawk's-beard is between 3 and 6 inches (8 to 15 cm) in height.

Glyphosate - In Roundup Ready canola, apply 0.5 L/acre at the 0 to 6 leaf stage. Not all products are registered. Check glyphosate pages.

Pasture Sage

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g/L) at 1.2 L/acre to the foliage of actively growing plants.

Banvel II - In grass pastures, rangeland and non-crop land, apply Banvel II at 1.86 L/acre in 10 to 20 gallons/acre (45 to 90 L/acre) water to actively growing weeds.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L/acre in 90 to 180 gallons/acre (400 to 800 L/acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Perennial Smartweed

Glyphosate - Apply 2.0 L/acre in 10 gallons/acre water. Apply when vines are a minimum of 8 inches (20 cm) tall, but before flowering.

Poplar

Glyphosate - As a non-selective spot treatment, apply 1.21 to 2.43 L / acre in 10 to 30 gallons / acre (45 to 135 L / acre) water in the summer through early fall when brush is actively growing.

Remedy EC - In grass pasture and rangeland apply 1.62 to 3.24 L / acre in 45 gallons / acre (200 L / acre) of water in broadcast treatment to fully expanded, actively growing foliage. Single stem foliar and backpack methods are also available - See Remedy section for details.

Banvel II + 2,4-D - In grass pasture and rangeland only, apply Banvel II at 2.1 L plus 2,4-D 500 amine at 4 L or 2,4-D 600 ester at 3.3 L per 220 gallons (1000 L) of water and apply by wand to the point of runoff when leaves are fully expanded.

Poverty Weed

Banvel II - As a spot treatment or in grass pasture or rangeland apply 1.86 L / acre Banvel II in 10 to 20 gallons / acre (45 to 90 L / acre) water when weed is actively growing. Banvel II at 0.61 L / acre will provide only top growth control.

Tordon 22K - In rangeland and grass pasture, apply 1.82 L / acre in 90 to 180 gallons / acre (400 to 800 L / acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Prairie Everlasting, Prairie Sage

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g / L) at 1.78 L / acre to the foliage of actively growing plants in the early fall, and repeat in the spring.

Purple Loosestrife

(dryland situations only)

Glyphosate - Apply 2.43 L / acre in 30 to 60 gallons / acre (135 to 270 L / acre) water when purple loosestrife is actively growing and at or beyond the bloom stage. If using hand held equipment, apply a 1 to 2 percent solution until plants are wet. Use a 33 percent product solution if using a wiper applicator. Do not treat plants over open water. If possible, remove and destroy the flower heads before treatment to ensure prevention of seed set. For large monocultures of purple loosestrife, gradually work from the periphery inward over a number of years to allow competing vegetation to invade the treated area. Sprayed areas should be monitored for new seedlings to prevent re-infestation of purple loosestrife.

Red Bartsia

2,4-D amine or LV ester - Apply 0.57 L / acre of formulations containing 500 g / L 2,4-D in 10 gallons / acre (45 L / acre) water. On hayland, treat within 10 days after first cutting. Roadsides and pastures should be sprayed as soon as the red bartsia appears, usually in early July. Repeat treatment if necessary for later germination.

Roses

Banvel II + 2,4-D amine or LV ester (500 g/L) - In grass pastures, rangeland and non-crop land, apply Banvel II at 1.48 L / acre with 2,4-D LV ester or amine at 1.78 L / acre to the foliage of actively growing brush in the spring or early summer.

Escort - In pasture and rangeland, apply Escort at 0.012 kg / acre with non - ionic surfactant at 0.2 L per 100 L spray solution in 10 to 20 gallons / acre (45 to 90 L / acre) water. Apply between mid-June and mid-August after the brush has leafed out, but before the leaves begin to turn their fall colours.

Remedy EC - In grass pasture and rangeland, apply 1.62 to 3.24 L / acre in 45 gallons / acre (200 L / acre) of water in broadcast treatment to fully expanded, actively growing foliage. Single stem foliar and backpack methods are also available - See Remedy section for details.

Russian Knapweed

Tordon 22K - In rangeland and grass pasture, apply 1.82 L / acre in 90 to 180 gallons / acre (400 to 800 L / acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Banvel II - In grass pasture and rangeland only, apply 3.72 L / acre in 20 to 30 gallons (90 to 135 L) per acre when leaves are fully expanded.

Saskatoon

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g / L) at 1.78 L / acre to the foliage of actively growing brush.

Scentless Chamomile

Ally plus 2,4-D - Apply 3 g / acre Ally plus 0.34 to 0.45 L / acre 2,4-D LV ester or amine (500 g / L formulations) in 10 gallons / acre (45 L / acre) water for control of scentless chamomile up to the 4 leaf stage in wheat, barley, and creeping red fescue. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Banvel II - Apply 0.51 L / acre Banvel II in 10 to 20 gallons / acre (45 to 90 L / acre) water to actively growing weeds for top growth control.

Bromoxynil+MCPA ester - Apply in registered crops at label rates when scentless chamomile is in the 2 to 4 leaf stage.

Curtail M - In registered crops, apply 0.81 L / acre in 10 gallons / acre (45 L / acre) water when scentless chamomile is actively growing and in the 2 to 4 leaf stage.

Escort - In pastures, rangeland and rough turf, apply 8 g / acre in 10 to 20 gallons / acre (45 to 90 L / acre) of water to actively growing plants of less than 4 inches (10 cm) tall. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Liberty - In registered crops, apply 1.1 L / acre to plants up to 4 inches (10 cm) in height.

Lontrel - In registered crops, apply 0.23 L / acre in 10 gallons / acre (45 L / acre) water when scentless chamomile is actively growing and in the 2 to 4 leaf stage.

Prevail - In registered crops, apply at a rate of 20 acres per case in 10 gallons / acre (45 L / acre) water when scentless chamomile is actively growing and in the 2 to 4 leaf stage.

Refine Extra - Apply 8 g / acre in 10 gallons / acre (45 L / acre) water to actively growing seedlings for suppression. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Tordon 22K - In rangeland and grass pasture, apply 0.445 L / acre in 90 to 180 gallons / acre (400 to 800 L / acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Stinging Nettle

2,4-D amine - Apply 0.91 to 1.82 L / acre of formulations containing 500 g / L 2,4-D amine.

Stork's Bill

Ally Toss-N-Go - Apply with 2,4-D or MCPA amine or LV ester in registered crops at registered rates to stork's-bill in the 2 to 4 leaf stage.

Attain - Apply at a rate of 40 acres per case to registered crops when stork's-bill is in the 1 to 8 leaf stage.

Basagran – In registered crops apply 0.91 L / acre at the 2 to 6 leaf stage.

Dichlorprop + 2,4-D - Apply at 0.71 L / acre to registered crops when stork's-bill is in the 2 to 4 leaf stage.

Glyphosate - in Roundup Ready canola, apply 0.5 L / acre in the 0 to 6 leaf stage.

Liberty - in registered crops apply 1.35 L / acre to plants in 1 to 3 leaf stage.

Linuron - Apply with MCPA amine in registered crops at registered rates to stork's-bill in the 2 to 4 leaf stage.

Odyssey/Absolute – in registered crops, apply 17 g / acre of the Odyssey component plus adjuvant.

Prestige - Apply at the rate of one case per 20 acres to registered crops when stork's-bill is in the 1 to 8 leaf stage.

Roundup Transorb - in Roundup Ready canola, apply 0.5 L / acre in the 0 to 6 leaf stage.

Spectrum – In registered crops apply at 20 acres per case from the 2 to 4 leaf stage.

Toadflax (Yellow)

Ally plus 2,4-D - Apply 2 to 3 g / acre Ally plus 0.34 to 0.45 L / acre 2,4-D LV ester or amine (500 g / L formulations) in 10 gallons / acre (45 L / acre) water for toadflax suppression in wheat, barley, and creeping red fescue. Add non-ionic surfactant at 0.2 L per 100 L of spray solution.

Amitrol 240 - Apply 7.6 to 11.3 L / acre in 10 to 30 gallons / acre (45 to 135 L / acre) water in non-cropped areas and pastures when the weed is in the advanced rosette to prebud stage.

Dichlorprop + 2,4-D - Apply 0.71 L / acre in 10 to 18 gallons / acre (45 to 80 L / acre) water in wheat or barley for toadflax suppression. Apply when majority of toadflax is no taller than 6 inches (15 cm). The use of Dichlorprop + 2,4-D for suppression of toadflax in wheat or barley should be part of a long-term planned approach for toadflax control, which includes spring and fall tillage, fall patch spraying, summerfallow or chemical fallow.

Glyphosate - Apply 2.83 to 4.86 L / acre when most plants have reached the early bud stage of growth. Allow 7 more days after application before tillage. A rate of 1.0 L / acre may be used with preharvest applications or when controlling in summerfallow situations.

Refine Extra - In registered crops, apply 8 g / acre in 10 gallons / acre (45 L / acre) water for suppression of toadflax. Apply when toadflax is less than 15 cm (6 inches) in height. Add non-ionic surfactant at 0.2 L per 100 L spray solution.

Tordon 22K - In rangeland and grass pasture, apply 3.6 L / acre in 90 to 180 gallons / acre (400 to 800 L / acre) of water to actively growing weeds. WARNING - Picloram is a very persistent and water-soluble herbicide. Do not apply to permeable soil. Do not apply to irrigated areas. Take special precautions to prevent drift.

Western Snowberry (Buckbrush)

2,4-D amine or LV ester (500 g/L) - Apply 1.82 L / acre 2,4-D amine or LV ester in a minimum of 20 gallons / acre (90 L / acre) water in spring or early summer. Retreatment may be necessary the following year.

Banvel II plus 2,4-D LV ester (500 g/L) - Apply 1.48 L / acre Banvel II tank mixed with 1.82 L / acre 2,4-D LV Ester in 20 gallons / acre (90 L / acre) water in spring or early summer after the leaves are fully expanded.

Escort - Apply 10 g / acre in 10 to 20 gallons / acre (45 to 90 L / acre) water between mid-June and mid-August after the brush has leafed out, but before the leaves turn their fall colours.

White Cockle

2,4-DB - Apply Embutox 625 at 1.1 L / acre or Caliber 400 at 1.7 L / acre or Cobutox 600 at 1.1 L / acre for top growth control to registered crops only.

Mecoprop - Apply 2.2 L / acre in 18 gallons water / acre (*80 L / acre) for top growth control of established plants. Will also control seedlings. Apply to registered crops only.

Wolf Willow (Silverwillow)

Banvel II + 2,4-D amine or LV ester (500 g/L) - In grass pastures with no legumes, apply Banvel II at 2.1 L per 1000 L of water with 2,4-D LV ester or amine at 4.0 L per 1000 L of water to the foliage of actively growing brush in the spring or early summer and wet the foliage until the point of runoff.

Wild Tomato

2,4-D or MCPA amine or ester (500 g/L) - Apply 0.34 to 0.45 L / acre to registered crops up to the 8 leaf stage of wild tomato.

Bromoxynil+MCPA ester - Apply 0.40 L / acre to registered crops from the 1 to 6 leaf stage of wild tomato.

Willow

2,4-D LV ester - In grass pastures and non-crop land, apply 2,4-D LV ester (500 g / L) at 1.78 L / acre to the foliage of actively growing brush.

Banvel II+ 2,4-D - In grass pasture and rangeland only, apply Banvel II at 1.7 L plus 2,4-D 500 amine at 3.24 L per acre in 20 to 30 gallons (90 to 135 L) of water per acre when leaves are fully expanded.

Glyphosate - As a non-selective spot treatment, apply 1.21 to 2.43 L / acre in 10 to 30 gallons / acre (45 to 135 L / acre) water in the summer through early fall when brush is actively growing.

Remedy EC - In grass pasture and rangeland apply 1.62 to 3.24 L / acre in 45 gallons / acre (200 L / acre) of water in broadcast treatment to fully expanded, actively growing foliage. Single stem foliar and backpack methods are also available - See Remedy section for details.

Soil Residual Herbicides

When applied at recommended rates in a crop, most herbicide residues will disappear within a few weeks after application and impose no restriction on cropping options the next year. However, some herbicide residues do not degrade quickly, and can persist in the soil for months or years following application, thereby restricting the crops that can be grown in rotation. Herbicide residues in the soil are deactivated in various ways including:

- Break down by chemical reactions,
- Break down by soil microbes,
- Escape to the atmosphere as a gas (volatilization),
- Break down by light (photodegradation),
- Leaching,
- Binding to soil particles.

Herbicides often disappear from the environment by more than one of these mechanisms. Many herbicides considered to be non-residual are bound temporarily to soil particles while they are broken down gradually by either soil microbes or chemical reactions. The binding action insures that the herbicide is not available to the crop in quantities that will cause damage.

As a general rule, breakdown processes are favoured by warm, moist soil conditions. During the winter, when the ground is frozen, and in the summer when the soil is dry, herbicide degradation is reduced. The residual activity of certain herbicides is also affected by soil organic matter and soil pH. These soil factors are seldom uniform across a field.

Herbicide carryover is aggravated by low levels of organic matter and is more likely to occur on eroded hilltops than in other parts of a field. The risk of herbicide carryover will also be greater in sprayer overlaps which are most common around headlands and slough margins.

Growers should be aware of the residual properties before applying any herbicide if they are to avoid cropping restrictions in following years. Knowledge of the limitations associated with herbicides that leave a soil residue, along with an accurate record of application (i.e. rates, locations) will serve to minimize rotational problems. Each herbicide used in mixes should be considered separately.

Soil tests using chemical extraction cannot always give a good indication of the potential injury risk from herbicide residue because of the influence of organic matter, clay and pH. Because of this, a field bioassay or laboratory bioassay, where plants are grown directly in the treated soil are best for detecting the potential for injury. These tests are not intended to be used to shortcut restrictions on the label, but provide information on rotational crops where none is available.

Injury symptoms from other causes can resemble herbicide carryover injury (i.e. cold weather, flooding, drought, insects, diseases, etc.). Consult with your local agronomist on potential causes before spending money on testing.

Herbicides that leave a soil residue and are of particular concern in Western Canada are found in the following chart.

Recropping Restrictions for Residual Herbicides:

Figures listed are the number of cropping seasons before each crop can be grown ("1" means that the crop can be grown the year following application). Products that have preseeding restriction (in days) are listed in italics. A blank space means that there are no recommendations given on the product label and a field bioassay is recommended by many product manufacturers to determine if these crops are safe to plant. A field bioassay is a strip of a test crop that covers an area of the fieldthat is representative of fieldthe variation and should include an untreated area. Laboratory soil residue bioassay services are also available from Alberta Research Council – Contact Harold Feddema at (780) 632-8238 or Sandi Checkel at (780) 632-8217 for more information.

PRODUCT	Alfalfa	Barley	Canaryseed	Clearfield canola	Non-Clearfield canola	Fababeans	Field corn	Dry beans	Field peas	Flax	Forage grasses	Lentils	Mustard (yellow)	Oats	Potatoes	Rye	Soybeans	Sunflowers	Wheat (durum)	Wheat (spring)	Wheat (winter)
2,4-D*	1	0d	1	1	1		1	1	1	1	1	1		1		0d			1	0d	0d
Absolute*		1	1	1	2					2				1					1	1	
Accent	1	1		1	1		1							1			1		1	1	
Adrenalin, Solo		1	1	1	1				1	1		1		1					1	1	
Ally (pH less than 7, Brown and Dark Brown soils)		1	4		2					2		3	4	1					1	1	
Ally (pH less than 7, other soils)		1	4		1					1		3	4	1					1	1	
Ally (pH 7 to 7.9, Brown and Dark Brown soils)		1	4		3					3		4	4	2					1	1	
Ally (pH 7 to 7.9, other soils)		1	4		2					3		4	4	1					1	1	
Altitude FX		1		1	1				1	1		1		1						1	
Amitrol		1d	1	1d	1d		10d*	10d*	5d*	1		1	1	1			6d	1	1d	1d	1d
Assert (Black and Grey Wooded soils)		1	2	1	1				1	1				2				1	1	1	
Assert (Brown and Dark Brown soils)		1	2	1	2				2	2				2				1	1	1	
Atrazine, Laddock*, Primextra II Magnum, Shotgun						1*	1		1*	1*											
Attain, Trophy	2	1	2	1	1	2	2	2	1	1	1	1	1	1	2	1	2	2	1	1	1
Avadex	0	0	0	0	0	1	1	1	0	0		1	0	2		1	1	1	0	0	0
Curtail M, Eclipse, Prevail, FlaxMax, Prestige	2	1	2	1	1	2	1	2	1*	1	1	2	1	1		1	2	2	1	1	1
Dicamba*		1		1*	1*		1	1*						1			1		0*	0*	1
Dual II MAgnum							1								1		1				
Edge	0		2	0	0	0		0	0		2	0	0	2			0	0	1*	1*	
Everest (Brown soils)																			1	1	
Everest (Dark Brown soils)		1*		1*	1*				1*	1*									1	1	
Everest (Black soils)		1*		1*	1*			1*	1*	1*									1	1	
Everest (Grey-Wooded soils)		1*		1*	1*				1*										1	1	
Frontier							0*	0*													1
Frontline, Spectrum		1		1	1				1					1					1	1	1

PRODUCT	Alfalfa	Barley	Canaryseed	Clearfield canola	Non-Clearfield canola	Fababeans	Field corn	Dry beans	Field peas	Flax	Forage grasses	Lentils	Mustard (yellow)	Oats	Potatoes	Rye	Soybeans	Sunflowers	Wheat (durum)	Wheat (spring)	Wheat (winter)
Kerb	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Lontrel		1		1	1					1	1		1	1		1			1	1	
Muster, Muster Gold	2	1	2		2	2		2	2	1	2*	2	2	1					1	1	1
Odyssey*, Odyssey DLX*	1	1	1	1	2				1	2		1		1				2	1	1	
Option	1	1		1	1		1	1	1					1	1		1			1	1
PrePass		0d		1	1				1	1		1	1	0d					0d	0d	0d
Prism		1				1*	1								1		1				0
Pursuit, Pursuit Ultra	1	1		0					0			1							2	1	
Reflex*							1	0									0			1	0
Sencor				2	2	0			0						0*		0*	2			
Sundance - organic matter less than 4%		2		1	2				2	2									1	0	
Sundance - organic matter less than 4% under drought**		3		1	3				3	3									1	0	
Sundance - organic matter greater than 4%		1		1	1				1	1									1	0	
Sundance - organic matter greater than 4% under drought**		2		1	2				2	2									1	0	
Trifluralin	0	1*	2	0	0	0	1*	0	0	1*	2	0	0	2		0	0	0	1*	0*	1*
Triton C*		1		1	1				1	2*		2*						1	1	1	
Ultim		1					1														1
Unity - soil pH less than 6.5*		1	2	1	1				1	1			2	1					1	0	
Unity - soil pH 6.5 to 7.4*		1	2		2				2	1			2	1					1	0	
Unity - soil pH greater than 7.4*		1	2		3				2	2			3	1					1	0	

* The minimum recropping intervals are listed. These intervals may be longer than those listed depending on the use rates, region, soil types, environment, time of application and crop varietiy. Refer to product page for more information.

** Drought restrictions apply to drought conditions (80% of normal June to September rainfall) for high pH soils (greater than pH 7.5) and severe drought (less than 65% of normal June to Sept. rainfall) for all soils.

0 - May be seeded or reseeded the year of application. No recropping restrictions. 1 - Next cropping season after application. 2 - Two cropping seasons after application.

NR - Not recommended. Note: The recropping intervals listed may not be sufficient to prevent crop injury during periods of below average rainfall.

Effect of Rainfall on Herbicide Efficacy

Required Interval	Product
15 minutes	Reglone
30 minutes	Horizon
1 hour	Achieve Liquid, Achieve Liquid Gold, Assure II, Axial, Bromoxynil, Bromoxynil+MCPA ester, Clethodim, Everest, Gramoxone, Harmony SG, Horizon BTM, Poast Ultra, Puma^{120} Super, Refine SG
2 hours	2,4-D LV Ester, Ally+2,4-D LV Ester, Atrazine (post-emergent applications), Fusion, MCPA Ester, Unity, Venture L
3 hours	dicamba+mecoprop-P+MCPA , Odyssey, Odyssey DLX
4 hours	Accent, Ally + 2,4-D Amine, 2,4-D Amine, Harmony Total, Liberty, Liberty 200 SN, MCPA Amine, Prism, Refine Extra, Refine M, Reflex, Triton C, Ultim
6 hours	Assert, Avenge, Curtail M, Express Pack, Express SG, Express TNG, FlaxMax, MCPA-K, MCPA Sodium Salt, Muster, Muster Gold, Option 35DF, Option 2.25 OD, Prestige, Prevail Liquid, Rustler, Sencor, Shotgun, Tordon 22K
8 hours	Basagran, Kerb, Laddock
No specific recommendation*	2,4-DB, Absolute, Adrenalin, Altitude FX, Amitrol 240, Attain, Bromoxynil + 2,4-D ester, dicamba, Dichlorprop + 2,4-D, DyVel, DyVel DSp, Escort, FlaxMax DLX, Frontline, Frontline+2,4-D, Glyphosate, Grazon, Harmony K, Linuron, Lontrel, MCPB + MCPA, Mecoprop-P, Pinnacle, PrePass, Pursuit, Pursuit Ultra, Remedy, Restore, Solo, Spectrum, Sundance, Trophy, Unity

* The products listed make no specific time recommendation on the label. The required rainfree period could be up to 8 hours. See the product page in the guide or consult the product label.

Note: The term “Rainfastness” refers to the time needed between application and rainfall to avoid significant reduction in efficacy. Rainfall shortly after application of most post-emergent herbicides may reduce weed control. Effect will vary with product, the interval between spraying and rainfall and the intensity and duration of the rainfall. These guidelines are based on label information. Use the longest time interval on the component products when considering tank mixes.