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VOLUME II.

NUMBER 7.

Bulletin No. 19

WEST VIRGINIA

Agricultural Experiment Station

MORGANTOWN, W. VA.

YOUR WEEDS AND YOUR NEIGHBOR'S.

PART I.

WEEDS AS FERTILIZERS.

NOVEMBER, 1891.



CHARLESTON:
MOSES W. DONNALLY, PUBLIC PRINTER.
1891.

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YOUR WEEDS AND YOUR NEIGHBORS.

C. F. MILLSPAUGH, M. D.,

BOTANIST.

In closing Bulletin 12, issued in December, 1890, I promised the farmers of West Virginia, that if they would assist me by answering some questions that I there subjoined, I would issue for their consideration a bulletin giving them the results of my investigations upon the subject of bettering our farms by diminishing the annual weed crop, and give them the benefit of such answers as I might receive from themselves and their neighbors.

The large number of painstaking answers received, and the diversity of material contained therein, together with the vast number of questions asked in return, and my own observations; results in such a large amount of material, that it is deemed advisable to issue the bulletin in parts as follows:

- Part 1. Weeds of Fertilizers, (now before you.)
- Part 2. Descriptive List of our Weeds.
- Part 3. Distribution and Bad Points of our Weeds.
- Part 4. General Treatment of Weedy Fields.

This series will be printed in a uniform manner, each part depending more or less upon the other, and references will be made from one to the other throughout; it would therefore be well for those interested in this subject to keep the parts together as issued, that such references may readily be made, as I shall aim to so completely treat this subject that farther publications upon weeds will be unnecessary in this State.

By a weed I shall be understood to mean: **Any plant that seeks to grow where it is not wanted by him who utilizes the soil, no matter for what purpose.**

To one speaking or writing upon this subject, the greatest difficulty he has to contend against is the variety of names any one weed may be known by in different localities. Hardly a weed, except a very few of the most common types, is generally known by a single name, and a large amount of descriptive labor is usually required to satisfy all ones readers or listeners as to just what plant is meant when a given name is mentioned. I hope to avoid most of this confusion by issuing Part 2, but to be fully understood by the reader of any locality I shall be compelled to use at times the botanical or scientific name, which remains the same before all people and in all languages, and when used can never be misunderstood. I shall however use such names parenthetically and as little as is consistent with a full understanding of the matter, and hope that those who find them confusing or in any way obtrusive will simply skip them, as the sentences in which they occur are so constructed that they will read as well to the general mind if these names are omitted.

WEEDS AS FERTILIZERS.

All plants during the process of their growth extract from the earth and air such elements of food as they may require for their subsistence, or failing to do so droop and die, or fail to reach maturity. It is just as essential to weeds to be properly fed as it is to crops, as far as the plants themselves are concerned; they therefore extract from the soil their due proportion of those food ingredients necessary for the proper growth and productiveness of paying crops. This being true, the question naturally arises: How shall we return to the soil those food elements of which it has been robbed by useless vegetation?

Every plant, no matter of what nature, that is gathered and removed from the field in which it grew, takes with it more or less of the food needed by the next plants to be grown thereon. In order then that the next growths shall properly mature, it is absolutely necessary that we return to that soil not only the principal loss but the other factors in plant life as well. This will explain why the use of Commercial Fertilizers alone, is so often denounced by farmers. These substances only aim to return to the land the three principal matters taken up in plant life, Potash, Phosphoric Acid, and Nitrogen. They in no wise tend to return the humus so necessary to cause the mineral elements to become available to the plants. This must be in the soil or supplied to it, if not there naturally. The only way in which it can be properly placed there is the natural way, that is by the decay of vegetable matter.

If, therefore, we expect to obtain a proper yield from any piece of land that has been previously cropped, we must return to it decayed vegetable matters, or allow it to rest in good sod. By doing so, we will never have cause to complain of sour or worn out fields.

The compost heap is, or should always be, the farmers most trustworthy bank. A bank only to be embezzled by lack of watchfulness and care on the part of the owner himself. In this bank, interest compounds itself, and deposits of worthless stock turn to available tender. Here should be placed to the credit of the farm every refuse thing of animal or of vegetable origin that can be found about the place, especially every weed of the field and roadside. The only bad result that I can foresee from this method, is the fear that the farmer who once realizes by practice what a valuable investment this compost heap is, may become covetous of his neighbor's weeds and be tempted to steal them.

In order to determine as nearly as possible the actual money value of weeds as fertilizing material upon the basis of "complete fertilizers," I gathered about fifty well known species, all that could be handled conveniently by our Chemist; who afterward subjected them to careful analysis. The result of these analyses, given below, convinces me of the value of these plants as fertilizers; and serves to show first, how much robbery they commit, and second, how much loss the farmer sustains who does not reclaim from them that which has been stolen.

In the following list of analysed weeds, the value of each per dry ton is expressed simply upon the basis of the commercial value of each constituent mentioned. When properly composted the actual value of each weed, (taking into account the quality the resulting humus has of rendering these mineral ingredients available as plant food,) per green ton is worth fully the figures given:

Name.	Nitrogen.	Phos. ac.	Potash.	Value.
* Poke-weed. (<i>Phytolacca decandra</i> , L.)	3.34	.65	8.00	\$21.93
Bitter Dock (<i>Rumex obtusifolius</i> , L.)	2.94	.50	4.29	16.26
Common Thistle (<i>Cnicus lanceolatus</i> , (L.) Willd.)	2.44	.62	5.53	15.79
Crow-foot Grass (<i>Panicum sanguinale</i> , L.)	1.89	.90	4.67	13.39
Sheep Sorrel (<i>Oxalis corniculata</i> v. <i>stricta</i> . (L.) Sav.)	2.04	.61	3.02	12.74
Fox-tail Grass (<i>Setaria glauca</i> , (L.) Beauv.)	1.77	.75	4.52	12.41
Pleurisy-weed (<i>Asclepias tuberosa</i> , L.)	2.02	.86	3.31	12.35
Sweet Clover, Bokhara Clover. (<i>Melilotus alba</i> , L.)	2.40	.50	1.95	11.87
Burdock (<i>Arctium Lappa</i> , L.)	1.85	.96	3.07	11.69
Ox-eye Daisy (<i>Chrysanthemum Leucanthemum</i> , L.)	2.12	.46	2.88	11.66

*Dr. DeRoode is responsible for the analyses, and Dr. Millsbaugh for the calculations of the valuations.
JOHN A. MYERS, Director.

Name.	Nitrogen.	Phos. Ac.	Potash.	Value.
{ Horse weed, Wild Lettuce (<i>Lactuca Canadensis</i> , L.)	1.07	.47	2.20	11.53
{ Wild Carrot (<i>Daucus Carota</i> , L.)	1.65	.62	4.21	11.47
{ Butter weed (<i>Lactuca leucophaea</i> (Willd.) Gray)	2.06	.52	2.89	11.44
{ Deer-tongue Grass (<i>Panicum clandestinum</i> , L.)	1.95	.76	2.90	11.44
{ Blue Thistle (<i>Echium vulgare</i> , L.)	1.45	.80	4.56	11.35
{ Iron weed (<i>Vernonia Novaeboracensis</i> , (L.) Willd.)	2.07	.42	2.11	10.63
{ Clot-bur (<i>Xanthium strumarium</i> , L.)	1.51	.73	3.45	10.43
{ Climbing Buckwheat (<i>Polygonum dumetorum</i> , scandens (L.), Gray.)	1.93	.40	2.31	10.38
{ Yarrow (<i>Achillea Millefolium</i> , L.)	1.71	.50	2.98	10.28
{ Wild Flax, Toad Flax (<i>Linaria vulgaris</i> , Mill.)	1.83	.64	2.30	10.27
{ Lobelia, Indian Tobacco. (<i>Lobelia inflata</i> , L.)	1.79	.65	2.35	10.11
{ Stickweed, White Devil, (<i>Aster lateriflorus</i> (L.), Britt.)	1.92	.56	1.61	9.80
{ Briars, (<i>Rubus villosus</i> , Ait.)	1.51	.32	.74	9.68
{ Wing-Stem, (<i>Actinomeris alternifolia</i> (L.), DC.)	1.40	.94	2.73	9.55
{ Old White-top, Velvet-grass. (<i>Holcus lanatus</i> , L.)	1.30	.45	3.72	9.38
{ Boneset, (<i>Eupatorium perfoliatum</i> , L.)	1.70	.53	1.94	9.23
{ Timothy, (<i>Phleum pratense</i> , L.)	1.48	.63	2.65	9.21
{ Milk-weed, Wild Cotton, (<i>Asclepias Syriaca</i> , L.)	1.71	.93	.78	8.77
{ Blue Devil, (<i>Aster cordifolius</i> , v. <i>laeviagatus</i> , Por- ter)	1.49	.52	2.25	8.74
{ Wild Coreopsis, (<i>Coreopsis tripteris</i> , L.)	1.56	.48	1.54	8.22
{ Nail-rod, Stick-weed, (<i>Aster lateriflorus</i> , var <i>hirsuticaulis</i> , Gr.)	1.47	.49	1.83	8.20
{ Wire-grass, (<i>Eatonia Pennsylvanica</i> (Spr.) Gray),	1.32	.52	2.26	8.10
{ Red-top, (<i>Agrostis alba</i> , var. <i>vulgaris</i> (With) Thurb)	1.39	.40	2.10	8.02

Name.	Nitrogen.	Phos. Ac.	Potash.	Value.
Quill-weed, Queen-of-Meadow. (<i>Eupatorium purpureum</i> , L.)	1.41	.36	1.81	7.83
Canada Thistle, (<i>Cnicus arvensis</i> (L.), Hoffm)	2.06	.45	2.74	7.58
Sorrel, (<i>Rumex Acetosella</i> , L.)	1.38	.21	1.89	7.47
Indian Hemp, Rheumatism-weed (<i>Apocynum androsaemifolium</i> , L.)	1.60	.44	.69	7.47
Elders, (<i>Sambucus Canadensis</i> , L.)	1.56	.31	1.00	7.41
Rag-weed, (<i>Ambrosia artemisiaefolia</i> , L.)	1.36	.41	1.79	7.32
Goldenrod, (<i>Solidago juncea</i> , Ait.)	1.27	.39	1.62	7.15
Spanish Needles, (<i>Bidens frondosa</i> , L.)	1.24	.32	1.92	7.14
Orchard Grass, (<i>Dactylis glomerata</i> , L.)	.95	.54	2.61	7.08
Naked-weed, Skeleton-weed, (<i>Chondrilla juncea</i> , L.)	1.13	.74	1.27	6.74
Oat-grass, (<i>Danthonia spicata</i> (L.) Beauv.)	1.13	.28	1.77	6.50
Old-field Balsam, (<i>Gnaphalium obtusifolium</i> , L.)	1.04	.41	1.75	6.35
Evening Primrose, Wild Beet, (<i>Oenothera fruticosa</i> , L.)	1.05	.39	1.68	6.29
Blue-joint, (<i>Andropogon provincialis</i> , Lam.)	.73	.24	1.29	4.44
Broom Sedge, (<i>Andropogon scoparius</i> , Michx.)	.78	.21	.68	3.68
Panicled Panic-grass, (<i>Panicum virgatum</i> , L.)	.60	.28	.68	3.40

GATHERING WEEDS FOR COMPOSTING. The best time of the season to cut from the meadow and pasture, as well as from the road side and unused field, the weeds that have sprung up and grown thereon, happens, luckily for the farmer, to be that period following harvesting of his grain; when, if ever, he has the time to so expend, while his men and teams are comparatively free for such use, and the majority of the weed seeds are not yet mature.

About the last of July, then, give the boys weed-scythes and set them at the road-sides, ditches and fence-rows; the older-hands with brush-scythes and mattocks can go over the neglected fields and prepare them for the mowing-machines, by first removing the stiffer growths; then the mower and horse-rake can soon gather a valuable mass of heretofore worthless vegetation, and the teams will haul it to the place it may be judged best to build the compost heap. Should any field have a bad growth of cinquefoil and running briars,

drop the guard-points of the mowing-machine sufficient to catch them up, and it will thoroughly cut over the field.

The question may be raised, why not burn the weeds after they have been raked up in wind rows? Should this be done one good effect would be gained, the killing of the seeds; but the farm would lose in that way the most valuable qualities of the weeds, the nitrogen and the humus.

Another question. Why not let them rot as they lay, and not be to the trouble of hauling and handling them over? This method would have two ill effects. First: the rotting would be incomplete, and the weeds would give off to the air most of their nitrogen; thus losing an average of nearly three quarters of their value. Second: many weeds will mature their seeds after being cut down, thus being able to perpetuate their presence upon the farm.

Still again it will be asked. Why not plow them under and let them rot in the soil. This method is a good one, especially with small or succulent weeds, and will be treated of fully in Part 4, but we are dealing with the weeds of those fields that are not intended for immediate cultivation, and with those spots upon all farms where cultivation is not carried on.

Only one question more remains to be answered, one that I hope will never be asked. Why not leave the weeds entirely alone, and let them fall in their places, they surely will do some good to the soil? True they would, and go on increasing and multiplying forever to the great detriment of the farm and neighborhood.

WHERE TO BUILD THE COMPOST HEAP. This will depend upon two particular points: First, where the resulting compost is to be spread when ripe. Second, whether chemicals or stable lye is to be used to aid in the rotting of the heap. If plaster (sulphate of lime) is to be used in the heap it may be built in or near the field where it is anticipated to utilize it. When manure, and especially stable liquor, is to be used, then the heap should be built in the barn-yard, as near as is convenient to the source of supply.

METHOD OF BUILDING THE FIELD HEAP. Select that point nearest the field upon which the material is to be used, that will, if possible, be near a source of water, in order in very dry periods that water can be thrown upon the mass without too much labor. Lay upon the ground a base of old fence rails, thick poles, or other timber that will allow of a circulation of air under the base of the heap. Upon this pile, throw a load of weeds and scatter over them about 100 pounds of plaster per ton; place another load of weeds on this and its proportion of plaster, and so on until the heap is large enough for the field or fields upon which it is to be used, or until the material is used up. Cover the heap when built to the extent desired, with earth or turf, as you please, turf being best. Note at the end of five days if the heap is wet; if not, throw on water if possible to assist the process of decomposition, but not enough to cause it to leach through. A heap thus formed will be ripe enough for use any time after two month's standing.

These field heaps may be built and prove valuable without the

plaster, especially if good stable manure is mixed in with the weeds. The plaster however is cheap, very cheap compared with the result gained by its use, and tends to more completely rot the seeds, as well as to kill injurious larvae, and fungi.

METHOD OF BUILDING THE BARN-YARD HEAP. Select that part of the barn-yard that will give a clay base if possible, and where eaves will not discharge upon the heap. Dig a pit about 12 or 18 feet square, about a foot or eighteen inches deep. At the lowest grade point of this pit and just outside its limits, sink a hog-head or other convenient receptacle, to catch the leachings from the pit; from which they can again be thrown upon the pile, at convenient periods. Lay in this pit rails or other supports as for the field heap. Build up with weeds and stable manure as before, and drench frequently with all such liquors as can be caught from stables and old manure heaps. This heap will rot rapidly and form very valuable manure, at little cost. Additions may be made to this heap as follows, all of which will add to its value.

Any vegetable substance used for bedding stalls, or dry earth that has been used for that purpose and become saturated more or less with stable moistures. Sawdust, shavings, leaves, straw, peat, weedy hay, etc. Soot from chimneys, wood ashes, small animals found dead about the farm, refuse hair, the meat from the carcasses of dead animals, (the bones, after soaking them a few days in sulphuric acid, should be thrown on, liquor and all), refuse corn stalks after feeding, and in fact all animal and vegetable wastes that can be gathered. It would be an excellent plan to keep a barrel sitting on an old sled by the kitchen door into which could be thrown all the household slops, dish and wash waters, etc. This could be periodically emptied upon the heap to great advantage. Finally and richest of all, the droppings from under the poultry roosts, should be treasured as gold.

I have treated this subject from the standpoint of a Botanist only and have trespassed as little as possible upon the domains of our Chemist and Agriculturist. These members of the staff will soon issue bulletins upon Fertilizers and the best methods of their use, as well as upon Composts, their construction and value. My desire in this bulletin having been simply to show that at least one method of eradication of weeds, will result in profit to the full value of the labor expended.

By following the paying procedures here set forth the farmer will gain:

1. The plant food of which the weeds have robbed the soil.
2. A decrease of weeds the following season in direct proportion to the countless thousands of weed seeds that this process properly carried out will destroy.
3. Fields easier to work, and crops cheaper to cultivate.
4. Cleaner pastures, with more room for good grass.
5. Sleek stock yielding better milk and beef.
6. Healthier homes and cleaner surroundings.

All of which will give him an enviable name for neatness, and his farm an appearance of thrift and prosperity.

