

not confined to the taking up of ready-formed solutions, they are also capable of attacking some of the solid ingredients of the soil, which they render soluble and then appropriate. This important action of roots exists in different degrees with different plants. The action takes place only at the points of contact between the root-hairs and the particles of the soil, and is brought about by the acid sap which the roots contain. The nitrogen, usually in the form of nitrates, is taken into solution by the water in the soil; but the phosphoric acid and potash exist in difficultly soluble forms, and are present in very small quantities in the water; consequently, the action of the root-hairs plays an important part in the supply of these constituents to the plant. It will thus be readily seen that if the soil is not in a condition to hold water, or if it has not been thoroughly pulverized, the roots may seek in vain for food in solution, and the points of contact between the root-hairs and the soil particles may be insufficient to materially help matters.

The development of the plant after germination follows a regular course. With an annual, which produces seed and dies during the first season, there is, after the development of root and leaf, which, as has been mentioned, collect and prepare materials for growth, the formation of the flower stem, and, lastly, the production of flower and seed. The materials furnished by the root predominate in the young plant, and it is, consequently, richer in nitrogenous matter and ash constituents than the older plant. As the plant matures, the proportion of carbon compounds—that is, the starch and cellulose, derived from the action of the leaves—steadily increases. By the time a cereal crop is in full bloom, it will contain all the nitrogen and potash which is found in the mature crop; the assimilation of phosphoric acid continues somewhat later, and the increase of carbon proceeds so long as the plant is in a green state.

Cereal crops, especially those sown in the spring—such as spring wheat, barley and oats—have a short period of growth. Barley, especially, may not have more than two months in which to collect all the nitrogen, potash and phosphoric acid contained in the matured crop. Moreover, barley, in particular, has very short roots, and, therefore, has not a large field from which to gather its food, and has a short time in which to do it. On the other hand, corn, mangels, clover, etc., have a long period of growth, and have deep roots. They are thus able to collect food through a longer time and from a greater depth. Then, too, the crops differ in their ability to take up the various constituents essential for their growth. Thus legumes, because of being able to make use of atmospheric nitrogen, are not in need of nitrogen, but have difficulty in obtaining the potash which they require. On the other hand, cereals make the greater part of their growth at a time when the soil may be deficient in nitrates, and before nitrification commences in the spring; and, further, they appear to lack the ability of appropriating this constituent, but, strange as it may seem, they gather potash with comparative ease. Turnips are shallow-rooted and do not collect phosphates readily, while mangels are deep-rooted and are heavy feeders, but have the greatest difficulty in gathering nitrogen. It will thus be seen that there are very decided differences in the ability of the various crops to gather food from the soil. Crops also differ in the amount of residue they leave in the ground. It is these differences in the characteristics of crops that makes it possible to so arrange them in rotation that one crop will help prepare the soil for the succeeding one, prevent loss of plant food, and help to insure a continuous supply of the constituents most in demand by the crop grown.

(To be continued.)

Prefers Not to Sow Clover Too Early.

Editor "The Farmer's Advocate":

For a great many years my idea in sowing clover in the spring on fall wheat was to sow as soon as I thought hard winter weather was past. At the end of March or first two weeks of April, when the frost was getting out of the ground and the ground settled a little, so that I could walk upon it easier than when it is very soft, I would take frosty mornings sometimes for cleaner footing. This method was to secure a good catch.

I have found out that it was a great mistake, as no doubt a great many others have. Many a time I missed a catch of clover by the above method, but never missed when I sowed later—that is, in spring seeding-time, when growth is starting.

A few years ago I seeded a field of fall wheat as I have described, and had a complete failure, so far as clover was concerned; had a fine catch of timothy, but that was sown with the wheat in the fall. That same year a neighbor of mine was putting in his spring grain; my son crossed over to his field when he was sowing his clover seed, and I remember that was late in the season, but a better stand of clover you would never wish. When the wheat was harvested the clover was well so amongst the wheat, so that the binder clipped it.

Some of my neighbors I know do not sow until late for the same reason. As for my part, I have never missed a good stand of clover since I adopted the late method. It was the frost, no doubt, that killed the little germ. In the bottom

of some of the furrows there were some plants, and some found where cracks sheltered the plant. Middlesex Co., Ont. JOHN LAWSON.

[Note.—Mr. Lawson raises an important point. The general opinion is that clover does best when sown early with fall wheat, while the ground is honeycombed with frost, and, on the whole, we favor this early April seeding for localities where the soil is heavy and inclined to bake with drouth, but it may be that more young clover plants have been injured by frost than we are aware of. Can anyone else give us the benefit of his observations on this point?—Editor]

How the Seed Control Act, 1905, is Working.

The Seed Control Act, 1905, has been in force since the first of September. Since that time a large number of letters have been received from seed merchants and seed retailers, asking our interpretation of the different phases of the law in respect to the sale of seeds presents.

During the time the bill was up for discussion in the House of Commons there were a number of impressions which got abroad respecting the Act and its objects that the law itself does not sustain. For instance, letters of inquiry come in asking what is meant by the Government seal to be placed on the package, and where can it be obtained? This arises from a misunderstanding of sec. 3 of the Act, or from some state-



Making Hogs of Themselves.

ments made by the travellers of some of the leading seed firms. From whatever source it emanated, it is evidently a confusion of the requirements of the Act to have all packages, bins or receptacles branded or tagged with the name and address of the seller, the kind or kinds of seed, and the common names of those weed seeds mentioned in sec. 3 of the Act only, where they are found in greater quantities than the margin of tolerance allows for seeds of first quality. This margin of tolerance will be explained in discussing sec. 5 of the Act.

It will be noted that very few of the fourteen weed seeds mentioned in sec. 3 are ever found in samples of grass or clover seeds. Those which do occur most frequently in the seeds of the grasses and clovers are mentioned in sec. 4 of the Act. They are nine in number, and nothing is said about requiring a brand or tag for them when they are present in sufficient quantities to prevent the seed grading No. 1.

The Act wasn't framed to impose any great hardship on the seed merchant or seed retailer, but it was calculated to protect the purchaser against fraud or misrepresentation. It was not intended even to compel a man to buy a better class of seeds than he wished, unless he wanted to buy screenings, the sale of which, sec. 6 of the Act prohibits for seeding purposes in Canada.

If seeds of any kind offered for sale will grade No. 1, or any term meaning No. 1, the law does not require to brand, tag or seal such seed. The seedsmen can be left alone to see that every purchaser of seeds shall know of its quality.

Having settled the branding question, which I trust is clear, and the method for which is described in clauses a, b, c, under sec. 3 of the Act, let us turn to another idea, which, though erroneous, many persons entertain. It is that clause 2, under sec. 3, which deals with the privileges of the farmer in selling his home-grown seed, exempts him entirely from all the provisions of the bill. I believe a careful reading of the Act will show that the farmer is privileged above other men only with regard to sec. 3. So far as the rest of the Act is concerned, it applies to him with equal force as it does to any other citizen dealing in seeds. It has been urged that even this exemption of the farmer will perpetuate the weed nuisance. Clause 2 restricts the farmer from peddling seeds or getting anyone to act as his agent. He must sell his home-grown seed, and sell it on his own premises when the sale is intended for direct seeding purposes. It is generally supposed, too, that where one neighbor deals with another in seed grain, that he has every opportunity of observing the different forms of noxious weed life existing on his neighbor's place.

If the farmer has clover or grass seeds for sale, it must not be forgotten that sec. 4 of the Act applies to his case. Sec. 4 of the Act deals solely with

timothy, alsike and red clover, and it should be understood that the germination test is considered here as well as the purity test. There must also be not less than 99 seeds in every 100 of the sample of the kind represented, or seeds of other useful or harmless grasses and clovers to grade No. 1. That is to say, if more than one per cent. is made up of dirt, chaff, broken seeds and weed seeds of any kind, it will not grade No. 1, and must be so represented.

Sec. 4 says that 90% of the sample must be germinable. There is allowed, however, for discrepancies, 5% more, so that 85% germinable seed will grade No. 1.

Sec. 5 of the Act provides for the margin of tolerance, and this margin may be changed from year to year. Without this clause the Act would call for absolute purity, and this is recognized to be impossible under the present condition of the seed trade. The presence of one wild mustard seed in a bushel of grain would condemn it as a No. 1 sample. It is known by a good many this year that the margin of tolerance is that one noxious weed seed may be present in each 1,500 grains of the sample of grass and clover seeds, and one noxious weed seed per pound in the cereals.

This margin of tolerance was calculated for the protection of the seed merchant, and not for the purpose of seeing how close he could grade his seed to this allowance and still have it grade No. 1. It is also intended as a guide for the Dominion Seed Analyst.

Sec. 6 of the Act gives the minimum standard of five noxious weed seeds per 1,000. If more than that exists in a sample it is to be prohibited from being sold for seeding purposes in Canada. This would allow of the presence of the noxious weed seeds mentioned in secs. 3 and 4 of the Act, of no less than, approximately, 411 in 1 oz. of timothy, 212 in 1 oz. of alsike, and 92 in 1 oz. of red clover.

Sections 11, 12 and 13 of the Act should be carefully noted, which deal with the requirements in taking samples to be sent to the Dominion Seed Analyst for a report. If seed marked as No. 1 is suspected, and the purchaser wants to know about its quality, he must take his sample in the presence of the one who sells him the seed, or before two impartial witnesses. In taking it from a sealed package, he must take the sample on breaking the seal, if from an open package it must be taken inside of seven days from the purchase of the seed. A certified statement is to accompany the sample from the purchaser, giving the name and address of the seller, the way the package was marked from which the seed was taken, and the section or sections of the Act which were alleged to be violated.

Something over 1,100 samples have been examined so far this year in the seed laboratory, and they are now coming in very rapidly, as the trade in seeds becomes more active at this season of the year. Most of these samples, which have been sent us by seedsmen and seed retailers so far have analyzed very well; a great many will grade No. 1, the bulk can be sold for seeding purposes, and there are a few samples that come in the prohibited list. There are a number of samples in which none of the noxious weed seeds were reported. Then there are others in which even as high as 49 noxious weed seeds were found in the five grams of red clover seed—five grams is equivalent to 3,250 seeds. The presence of three noxious weed seeds in the five grams would prevent the sample grading No. 1, and more than 16 to the same amount prohibits its sale.

A great many of the seed retailers are safeguarding their interests by having the samples sent them by the seed merchants tested. This is causing the seed merchants to be very careful what they send out, and is certainly insuring a better all-round grade of seed for the market requirements this spring.

Some who get their reports in purity have trouble in knowing how to classify their seeds. The sheet on seed testing, which accompanies the report, conveys sufficient information to work out that problem quite easily, as it gives the average number of seeds in a gram each of red clover, alsike and timothy to be, respectively, 650, 1,500 and 2,900. Five grams of red clover are taken, and two grams each of alsike and timothy, for examination for purity. There are three things which may prevent the grass and clover seeds from grading No. 1: (1) Too many noxious weed seeds; (2) more than 1% made up of weed seeds and dirt, and (3) the germination of the seeding falling below 85%. New seed can usually be banked upon for germination, but to be absolutely sure of the quality of seed, one should have the purity test.

So many in sending letters and samples of seeds to the Seed Branch use postage, that it is felt that their attention should be called to the fact that not only does the Seed Branch test samples free of charge, but O. H. M. S. brings everything to the Branch instead of postage, when addressed, Seed Branch, Dept. of Agriculture, Ottawa.

Seed Division, Ottawa.

T. G. RAYNOR.

Spreading the Gospel of Progress.

I think it will be through your valuable paper that the first cement silo will appear in Eastern Ontario. Being an ex-student of the Ontario Agricultural College, I find "The Farmer's Advocate" of great help to me, as you keep in very close touch with the College. I enclose a short article on "Care of Manure." The discussions on such subjects as taken up by "The Farmer's Advocate," are very much appreciated by your readers down here.

CLARK HAMILTON.

Dundas Co., Ont.