

securing a catch, there would appear to be little use in sowing anything but timothy where seeding must be left till the last of August.

Various Crop Rotations.

Clover or pasture sods, when turned under, leave the soil in most excellent condition for the production of forage crops, such as roots and corn. Soils which have been occupied by roots or corn have lost by the end of the season a considerable proportion of the humus they contained at seeding time. They are, however, compacted and in most excellent shape for growing grain. The grain crops grown upon fields which have been under some hoed crop the previous year are likely to give large yields of seed, with a comparatively small proportion of straw, the ideal condition for most profitable returns.

It is evident, therefore, that each crop affects the condition of the soil in its own peculiar way, and that the condition in which a soil finds itself after having borne a certain crop is nearly always the condition best suited for the production of some other crop.

Having observed the peculiarities of crops as to food requirements, conditions of growth and residual effects upon the soil, it is evident that it should be possible to work out a succession of crops where the soil condition after each would be such as best suited the growth of the next. Arranging crops in this way is called "Rotation of Crops."

Thus briefly and clearly did J. H. Grisdale, Director of Experimental Farms, set forth last year before the Standing Agricultural Committee of the Senate the philosophy of crop rotation, a subject on which he has done considerable experimenting at Ottawa, and which he has studied quite closely.

Rotation of crops means the following of one crop with another in a regular and ever-occurring or repeated succession. Rotation comes from the word "rotare," meaning "to turn round," hence a rotation might possibly include only two crops, as, for instance, hay and grain alternately for a long period of time. Generally speaking, however, a longer rotation—that is, a succession of crops including a greater diversity, is meant when one uses the term rotation.

SEVEN DIFFERENT ROTATIONS.

Mr. Grisdale then set forth the following seven plans of rotation, which he proceeded to discuss, pointing out their adaptability to varying conditions, but especially commending C and D.

A.—Two-year rotation—Grain, hay.

B.—Three-year rotation—Grain, hay, hay or pasture.

C.—Three-year rotation—Hoed crop, grain, hay.

D.—Four-year rotation—Hoed crop, grain, hay or pasture, hay or pasture.

E.—Five-year rotation—Hoed crop, grain, hay, grain, hay or pasture.

F.—Five-year rotation—Hoed crop, grain, hay, pasture, grain.

G.—Six-year rotation—Hoed crop, grain, grain, hay, hay or pasture, pasture.

SOME REASONS FOR ADOPTION OF A ROTATION.

Any one of these rotations, carefully followed, and the cultural operations connected therewith performed at the right time and in the right way, would be sure to increase tremendously the crop production of any given farm, and at the same time increase but slightly, if at all, the cost of production. In addition to the increased returns and lower cost of production per unit of crop, the following advantages might be anticipated from the introduction of a rotation into the farming operations of the average Eastern Canada farmer:

1. The cost of fencing on farms where live stock are kept would be materially reduced, since it would be necessary to fence off only three, four or five fields, instead of fifteen or twenty, as is very commonly the case. Farmers, of course, do not always fence off each small field; still, where fields are not fenced, the disadvantage of being unable to pasture any given area when conditions were such as to invite such treatment, and the trouble of driving cattle across unfenced fields to reach other fields, would more than make up for the extra cost incurred in the construction of suitable fences. The introduction of a rotation, including a few properly-fenced fields, would do away with all trouble in this respect.

2. All cultural operations of one kind would be in one field, thus lowering the cost by reducing the travelling necessary from one small plot to another. All corn or hoed crops would be together, all grain crops in one group, and all hay crops in another; hence much time would be saved, and so cost of production lowered.

3. Larger machinery could be used. Where fields are few they are sure to be larger, and larger fields can always be handled more cheaply with large machinery.

4. Every field would receive its fair proportion

of barnyard manure, and receive this manure at regular intervals. In this way, every part of the farm would be kept in good tilth, and the whole farm kept up to its highest producing possibilities. As operations are usually conducted on farms where no rotation is practiced, certain fields adjacent to the farm buildings, or supposed to possess some peculiar soil characteristics, are usually favored, to the disadvantage of the rest of the farm. Many farms include small areas upon which practically all the manure is lavished each year, greatly to the detriment of the rest of the farm, and much to the disadvantage of the owner. The influence of a rotation in improving conditions in this respect can hardly be overestimated.

5. Considerably less labor is required to keep fields in good condition where a rotation is followed. While it might be claimed that plowing a field every third or fourth year would involve a large amount of labor, it can be stated, on the other hand, that performing these cultural operations more frequently permits of their being performed much more easily year by year. At the same time, if careful record be kept of the amount of labor upon a field where no rotation is followed, it will probably be found that practically just as many hours of horse labor or man labor have been spent as where under a short rotation.

6. Fields under long rotations or no rotations are almost certain to become infested to a greater or less extent with weeds. Fields under a short rotation are practically always clean, provided, of course, that the cultural operations are properly performed. The value of the rotation in helping eradicate all injurious plant life is a point the importance of which cannot be too much impressed upon our farmers in Eastern Canada today, where weeds are so exceedingly prevalent, as is well known to be the case.

Many other minor points might be cited in favor of the introduction of a rotation. The above should, however, suffice to indicate its value on the farm. The rotation, as I have attempted to demonstrate, is important, but no rotation can make up for poor cultivation or faulty soil treatment.

GARDEN & ORCHARD

Late Spray for Codling Moth.

Quite an informing article on "The Control of the Codling Moth" appears in the June number of Better Fruit, under the name of A. L. Melander, Entomologist, Pullman, Washington State. For control of this insect, the writer lays much stress upon a very thorough calyx spraying—that is, the spray which is applied just after the petals have fallen, and which is designed to fill the interior of the blossom-end with poison. As the blossom-end of the apple attracts about 80 per cent. of the worms, the strategical importance of laying a bait here in the lower cavity, before the calyx cup has closed up and the apple turned over on its stem, must be obvious to the least informed. "This spraying lays a death-trap which continues effective throughout

the season, automatically taking its toll of four-fifths of the worms. While the first spraying aims primarily to fill the calyx cup, it coats the outside of the apples and leaves as well, thus reducing the number of worms entering the sides of the fruit. A complete 'calyx' spraying, assisted by the natural mortality of winter and spring, practically annihilates the first generation of the codling moth. Sometimes the very few worms that escape may produce an appreciable number of second-and-third-brood worms." (In Canada it has been held there is not a second brood, only in certain of the more southerly sections). To ascertain whether to depend on the calyx spraying alone in combatting codling moth, Mr. Melander advises keeping some of the trees banded with burlap, and observing whether many or few worms are trapped two or three months later. These bands, he says, catch about half the worms, and as the codling moth lays about forty eggs, a calculation can be made as to whether additional sprayings would be warranted.

While the writer quoted concedes that a second or even a third codling-moth spray may occasionally be called for in his State, he makes a good point in urging that one very thorough application just after the blossoms fall is better than two or three less careful applications, and very wisely cautions against slighting the supremely important calyx spraying out of dependence upon later applications.

"Where the inner cup of every blossom has been filled with spray—and practically this can easily be done—the calyx spraying alone has controlled the codling moth over many hundreds of acres of orchards. One hundred growers, asked how they spray, and with what success, reported as follows: 40, giving one spraying to 597 acres, lost 1 per cent. of 161,181 boxes; 27, giving two sprayings to 459 acres, lost 4.5 per cent. of 148,700 boxes; 15, giving three sprayings to 216 acres, lost 4.4 per cent. of 42,388 boxes; 18, giving four to eight sprayings to 253 acres, lost 8 per cent. of 72,010 boxes. Such results, obtained by the practical fruit-grower, indicate not only that the first spraying can be made so complete that it alone need be depended on, but, furthermore, that the best general results follow this method of calyx spraying. Those who depended rather on later applications, probably thereby slighting the importance of thorough calyx spraying, averaged lower returns. A complete first spraying lessens the number of late 'stings.' The stings, resulting from worms biting through the skin before dying, are always abundant when late applications must be given. Such statistics do not mean that the man who has had wormy apples in the past, after spraying many times, can hope to improve his orchard by spraying less often, if he continues to use the same method as before. His need is a more thorough application of the calyx spraying before he can afford to omit any of the later sprayings."

For material, he recommends arsenate of lead, one pound of the paste to fifty gallons of water (American measure), applied with strong pressure through a nozzle of the Bordeaux type, which throws a coarse, penetrating, fan-shaped spray. Where combating codling moth is the object, he prefers that the arsenate should be applied with-



Young Apple Orchard at Weldwood.

The trees were planted on strips plowed last December out of a new seeding of clover. The clover, cut in June, yielded about 2½ tons per acre. The young trees are doing splendidly. Space in rows between trees is planted to potatoes and roots.