

nett on the improved condition for farm women, why every farmer and his wife should join the Grain Growers' Association and how it could be made more helpful.

President Reynolds of the Agricultural College then addressed the convention on "The Problems of Agriculture." The speaker said one of the worst was the land gambler who held land and did not improve it, only waiting for it to advance in price and then sell it again. Another important problem was the selling of our produce to the best advantage.

Altho this is President Reynolds' first year in the West it was very plain to every one present that he understood the position of the Western grain grower and was very much in sympathy with the work of the Grain Growers' Associations.

Mrs. Tooth then read a paper on "Erasing the hyphen," showing how every person in the country could be made a good citizen and how we could have a united people. R. C. Henders delivered an address to The Public School Teacher showing how some of the farm problems could be worked out in the educational system. How much better it would be in a good many cases if the inspector inspected the trustees as well as the teacher. He also gave some good pointers on the consolidated school, setting out both the advantage and disadvantages. He also showed how it would be impossible to consolidate a school in a thinly settled district, but to make consolidation a success it seemed necessary to have a good village for a centre. Mr. McGuire then addressed the convention and showed some ways in which the country schools could be improved. One thing was more co-operation between the teachers and the parents and that the grain growers could help a great deal in this way. He also thought that the studies could be made more practical. C. H. Burnell spoke on how the teachers could help the grain growers. Dr. J. Johns of McGregor, then addressed the convention on co-operation, showing how the greatest enemies of co-operation were ignorance, indifference and selfishness. He explained how it had helped the miners in South Wales and showed what it could do for the farmers in marketing their produce and buying their necessities on the farm. The secretary drew the attention of the convention to the samples of wheat which were 1, 2, 3, and 4 Northern of the Winnipeg and Minneapolis grades. Two sets of these samples will be circulated in the eastern part of the district and two in the western part so that every farmer will see them and learn the difference between the grading of wheat in Winnipeg and Minneapolis.

Moved by B. Richardson, seconded by W. Miller, that a hearty vote of thanks be tendered the speakers for the able addresses they had given. R. C. Henders suitably replied. A large number of school teachers were present and claimed they had had a pleasant and profitable day. The convention then closed by singing the first verse of the national anthem.

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Cultural Methods in Seed Production

By W. C. McKillican, Supt. Brandon Experimental Farm

In the production of all crops, the seed and the soil are two indispensable factors. The efforts of the Canadian Seed Growers' association and its individual members are directed chiefly toward the improvement of the first of these—the seed. No more worthy nor important object of agricultural endeavor could be imagined. Thru seed improvement greater progress can be made because of concentrated effort and specialization in that one line. However, so closely does the second factor of production—the soil—enter into seed selection work, that no matter how one specializes on seed, the culture of the soil can never afford to be neglected. The most valuable work in selecting strains of seed of the greatest yielding power and greater suitability to the purpose for which they are intended, may be brought to naught thru injudicious work in the handling of the land. One main object of cultural methods is to conserve the purity of the valuable selected seed that has been consigned to the earth. Methods must be adopted that will ensure that there will be no noxious weeds and foreign grains growing up among the crop. Another object of cultivation is to ensure as large a return as possible, and a third is to produce seed of as fine quality and appearance as possible. All these must be accomplished at a cost that will allow of a profit on the whole undertaking.

Previous Crops on Land

No more important factor affects the condition of the land than its previous cropping history. The most desirable land for pure seed growing is the virgin prairie. Where it can be obtained the problem of the preparation of land for seed growing is easily solved. But on old farms, where the land is all in use, land that has borne crops must be used. It is obvious that the land must go thru some cleaning process before being used for seed growing, since it is a well established fact that grain grown after grain does not have the purity desired. The most common method of cleaning the land for seed growing is the summerfallow, others are the growing of hay crops and the growing of hoed crops. Let us compare these three methods of cleaning land as judged by the different requirements enumerated above. First, as regards the ensuring of purity: I believe the seeding down method is the most effective. The weeds whose seeds are most difficult to remove from seed grain are annuals such as wild oats and wild buckwheat. A single year of summerfallow or hoed crop is not always effective in getting all the seeds of these weeds that are in the ground to grow; they come up the next year and form dangerous impurities in the seed grain. Where land is seeded down for two or three years, these weed seeds decay in the ground and the following crop of grain is freer from weeds than any except on virgin prairie. Choosing between summerfallow and hoed crop, it must be said that the fallow is likely to be the most effective in so far as control of weeds is concerned unless the hoed crop is very carefully hoed.

In regard to size of return, the choice between the three methods cannot be made so easily. Possibly all seasons being averaged up, summerfallow will give the biggest return. But both the other preparations will give very satisfactory yields when properly handled and in moist seasons are very likely to excel summerfallow.

In regard to quality of grain, I think there can be no doubt that seed land will produce a harder, more uniform type of wheat than summerfallow will in seasons of average or abundant moisture. In dry seasons the summerfallow will produce a plumper berry, but when moisture is plentiful there is a great danger of summerfallowed crops lodging and producing grain of very inferior quality. Thus the probabilities are more in favor of either seed land or corn than fallow.

In regard to profit on the crop, there can be no doubt that the summerfallow is the most expensive method of preparing the land. It makes no return for the use of the land during the sea-

son of fallow. Corn, on the other hand, yields a large return of fodder while the cleaning is progressing and hay makes a return not so large as that of corn but obtained with less cost in regard to labor. Experimental results have shown us clearly that wheat after either hay or corn is more cheaply produced than after fallow. Probably better than either hay crop or hoed crop alone as a preparation for seed grain is a combination of the two together. The hay crop should come first then the corn be planted on the sod. This gives a longer period of cleaning and gives two methods of eradicating the weeds. It produces crops while the cleaning process goes on, and if cultivation is conducted properly, the grain crop that follows should equal in purity, yield and quality, anything that could be grown.

Rotation of Crop

In arranging for the most desirable preparatory crops for his pure seed grain, it will be advisable for the seed grower to adopt a regular rotation of crops that he can follow continuously. The rotation should provide for the desired sequence of crops and for the proportion of the various crops that the farmer wishes to grow. Having decided on a rotation, the farmer should divide his land into such divisions that will permit of its operation. Once such a system has been established, the proper preparatory crops for seed production will recur automatically on the different fields and save the operator much worry in figuring out from year to year how he is to get a clean piece of ground on which to grow his selected seed.

The best method of preparing sod land for grain crop will depend somewhat on the character of the sod. An old, well-established, tough sod will require different treatment from a recently sown one composed of easily killed tame grasses and clover. Where a rotation of crops is followed, the latter will be the type of sod encountered. In handling sod of this type, the following method is found to be successful at the Brandon Experimental Farm. The hay crop is cut about July 1 to 10. As soon as the hay is harvested the land is plowed; this is usually completed about August 1. The plowing is done moderately deep, four to five inches. This land is disced frequently enough during the remainder of the season to prevent the grass recovering from the plowing. Land handled in this way gives a crop equal to summerfallow and free from impurities. With old, tough sods, especially native or brome grass, it would be advisable to break shallow, not later than June 20, and backset about August, about two inches deeper than the breaking. Such additional packing and discing as is required to kill the sod must be given. This entails the loss of a crop and is equally as costly as summerfallow. It is much better to handle hay production in such a way as to have a more easily handled sod.

Handling Summerfallow

Where summerfallow is the cleaning method used, it is of the greatest importance that the plowing be done early. The weeds growing on the land must be destroyed before they form pods. Where it is found possible to do it, skim plowing the previous fall the land that is to be summerfallowed helps to control the weeds. Or a good discing, either in the fall or early spring would have a similar effect in causing seeds to germinate which would be turned under by the regular summerfallow plowing. The proper working of summerfallow on old land requires a good deal of judgment and careful observation. It must be cultivated well enough to kill the weeds and hold the moisture, but if cultivation is overdone, there is danger of getting such a fine, powdery condition of the soil that it will blow. The broad-sheared cultivator is a valuable implement in this connection, as it does not pulverize as much as the disc and it is more effective in cutting off the weeds. Whether summerfallow should be plowed a sec-

ond time during the summer or not depends on the type of weeds to be combatted and to some extent on the season. If perennial weeds such as sow thistle or Canada thistle are to be eradicated, two plowings will be found more effective, especially if there has been a wet spell during which surface cultivation has been impossible. But if wild oats and other annuals are the prevalent weeds, one plowing is best, the surface being kept bare by persistent cultivation or pasturing. If the land is plowed a second time, there is a danger of bringing to the surface weed seeds that have lain below the level of growth. Some of these are likely to remain ungerminated until the next spring and destroy the purity of the crop. By surface cultivation, the effort is concentrated on the seeds within growing distance of the surface, and there is a greater hope of obtaining complete germination. In the control of annual weeds, pasturing is a very effective means of keeping the summerfallow clean. The tramping of the stock induces more complete germination than is likely to occur in a loose, cultivated soil. The stock eat off most of the ordinary weeds that occur. This method saves work and provides feed for stock. It is not, however, as effective in storing moisture as a bare fallow. It is, therefore, suited best to localities where moisture conservation is relatively less important than weed control. It is quite ineffective against perennial weeds.

Handling the Hoed Crop

The use of hoed crop such as corn or roots as a preparation for seed grain has been referred to. This should only be attempted on reasonably clean land. Where the land is foul with weeds, cleaning it thoroughly by this method would entail too much work. But on reasonably clean land that it is desired to put in good till for seed growing, a well cultivated crop of corn is as good as fallow and makes the cost much lower. In combination with either sod or fallow in cleaning land it would be very effective. It would lengthen the cleaning period, thus increasing its effectiveness, and the cultivation would leave the land in ideal till. In order to make this method a success, thoroughness in methods must be enforced. Hoing must be practiced in addition to thorough cultivation. The check-row system of planting, by which the corn is planted in hills in rows both ways, allows of more effective work in cultivating and is therefore advisable where the production of clean seed is one of the objects. Whatever methods are adopted in preparing land for pure seed growing, thoroughness in their application is essential. The best of methods may easily be made non-effective if not carried into execution with thoroughness and good judgment.

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