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Agricultural Problems in Manitoba—An Interview with the Chemist of the Dominion Experimental Farms.

In an interview which we had with Mr. Shutt, Chemist of the Experimental Farms, as he passed through Manitoba on his return from British Columbia last month, he told us that he had been able to spend a short time in this Province, enquiring into some of the agricultural problems which to-day confront the Manitoba farmer. The season of year was not, of course, the most favorable, nor was the time at his disposal sufficient to allow him to consider these as fully as he would have wished, but he had been able to arrive at a knowledge of certain questions of importance which would assist him in conducting the laboratory work which would be necessary in order to obtain definite information on certain doubtful points.

Mr. Shutt said that at the present time he considered the question of the conservation of soil moisture for the use of the wheat crop was of first importance. An acre of wheat required at least 300 tons of water to bring it to perfection, and this water was more especially needed during the early period of the plant's growth. In districts subject to drought it was incumbent that the previous year's rain should, as far as practicable, be stored up in the soil. This could be brought about by deep plowing, summer-fallowing and keeping the soil well cultivated. Deep plowing increases the absorbent capacity of the soil for moisture, and constant cultivation provides a thin layer of dry earth mulch, which arrests evaporation. We shall have to study out the best system of soil treatment with this object in view, for undoubtedly at present the wheat yield is more dependent upon climatic conditions, among which water plays the most important part, than any other factor. The question is one that concerns the Territories more than Manitoba, but is, nevertheless, one of great consequence in many districts of the latter Province. To this end, Mr. Shutt intends to determine at certain seasons the amounts of moisture in soils under different systems of cultivation.

Another matter of considerable significance is the partial exhaustion of the land by successive cropping without any return of the plant food. The system, if such it can be called, must have led to a depletion of available plant food and of the humus or decayed vegetable matter in the soil. Many farmers have already noticed a decrease in yields, which must be due to this fact. Mr. Shutt considers that the growing of clover as a preparation for wheat should be tried, especially on the higher and poorer lands. This will not only add much nitrogen—an element specially required by the wheat crop—and prepare mineral food (phosphoric acid and potash) for succeeding crops, but also improve the water-holding capacity of such soils by the humus it furnishes.

Nitrification, or the conversion of organic nitrogen in compounds (nitrates) that are available to crops, is also an important question. Mr. Shutt is of the opinion that summer-fallowing does much useful work in this direction, and he proposes, as time permits, to conduct some experiments to ascertain to what extent this may be true.

The leaching of the valuable nitrates, in Manitoba and the Territories, during the winter is a matter upon which something has been written of late, both here and in Great Britain. Mr. Shutt does not think there can be any appreciable loss from this cause, as stated by a prominent agriculturist in England, as there are no winter rains practically, but he intends to find out the facts, and for this investigation has enlisted the co-operation of the superintendents of the Experimental Farms at Brandon and Indian Head in this important work. In this connection it is also proposed to try

the effect of dressings of nitrate of soda in the early spring.

The solution of these and other closely-related problems will involve a considerable amount of careful chemical work, but as the results are likely to prove of the greatest value to the farmers of the great Northwest, we hope the Dominion Government, through its Agricultural Chemist, will be able to give us the necessary assistance. If through the possession of such knowledge as comes from scientific and chemical investigations we can increase the yield of wheat per acre, if only by a bushel or two, the expense of the work will be as nothing compared to the benefit to our Province and the Dominion at large. And in this connection it is well to remember that no true and permanent progress can be made unless founded upon results obtained by scientific research.

Keep the Soil in its Virgin Condition.

As this season of the year is not an exceptionally busy one, it is a proper time to compare notes regarding the past and future of our farm work. Regarding the maintaining of the fertility of the soil, I feel quite sure there are few countries, if any, that have so great a uniformity of soil as this Province. There is hardly an acre of land, with proper cultivation, but is capable of growing from fifteen to thirty bushels per acre in a good fair year, or an average of sixteen bushels for ten years.

The question then arises, how long can this yield be maintained? Just so long as we do our duty to the land. Be liberal in the treatment of the land and it will come back every time. To this end keep the land as near its virgin state as possible, never letting the humus be all exhausted. Some lands will hold it longer than others. Heavy clay loam and black alluvial soil will stand twice as much cropping as sharp, gravelly soil, which has not an over-abundance of humus in it to start with. On the latter take no more than two crops, then sow something to plow under, such as spring rye or oats, as a summer-fallow. Green manure on such land lasts longer than barnyard, or a coat of twelve loads of barnyard manure to the acre might be given. Such land should not be plowed deep; keep the manure near the surface; take one crop wheat, one of barley, and seed down to Bromegrass with the barley. Next year it would keep colts or sheep, as they will live where cattle would starve.

This season of the year is a good time to determine what kind and how much stock should be raised and kept this present year. There is no question but stock of all kinds pay well, horses especially, and likely to be so for a few years with increased emigration and larger areas under cultivation and extension of railroads. From \$80 to \$100 for a colt coming three years old pays remarkably well. I consider colts are more cheaply raised than calves. When hay is not plentiful, oat sheaves or common barley, cut on the green side (just when it commences to color), makes splendid feed for any kind of stock—so does Bromegrass. In this section we can get pasture at reasonable prices. With stock we will be better able to keep up the fertility of the soil, which should never be lost sight of. In applying manure, when practicable draw from stable to field and spread it from vehicle instead of putting it in heaps, as it is a waste of time and cannot be as evenly done, and by so doing it is ready for the plow and it loses nothing by evaporation, because it does not get a chance to heat. If I was where I could get plaster of Paris or salt, I would cover every heap of manure I had to keep it from heating. Some think it should be rotted to kill the weeds, but this is a mistake; the cultivator or harrow will kill them when from half to one inch high. In a manure pile a few in center may be killed by heating, but not near the outside.

I was speaking about horses paying well, and so do cattle at the present values: cows, \$40 to \$50 for very common stock; good grade calves, say a 8- or 9-months-old calf, bringing \$20 each. I would advise keeping calves in the stable all summer, giving them plenty of water and some milk and one sheaf of oats per day, and it will pay every time.

Arthur Municipality.

J. S. THOMSON.

The Problem of Self-Government in the N.-W. T.

BY JOHN HAWKES, REGINA.

(Continued from last issue.)

ESTABLISHMENT OF VILLAGES.

The subject would be insufficiently treated if something were not said of the problem of urban organization. The objection to municipalities was by no means confined to the country districts in these bygone days. It was found that quite considerable towns and villages on the lines of railways refused to become town municipalities. They had, therefore, practically no sanitary organization, and all improvements were more or less voluntary—dictated chiefly by the self-interest of property-owners. Refusing to blossom out into towns with a full regalia of mayor, council, town clerk, assessor, and collector, or to become the center and part of a rural municipality, it was felt that something should be done to make it easy for these places to have some sort of organization; hence the Village Ordinance, which was at first optional with the community, but at the last session of the Assembly an alteration was made by which the Commissioner of Works could erect any district containing ten dwelling houses (the ordinance, by the way, does not specify that the dwelling houses are to be inhabited) into a village. The Commissioner's action, however, is nullified if within thirty days a majority of the residents petition against the formation of the village. A fight was put up by the Opposition against the proposed change; but the change carried. The governmental machinery of a village under this ordinance is simple. The ratepayers meet and elect an overseer, who is the only paid officer. His duties are to assess all the property in the village, prepare an assessment list, strike a rate which must not exceed ten mills on the dollar, collect the rate and expend it. He may incur any debt not exceeding \$100 for village purposes, pending the collection of taxes. A poll tax may be imposed, also dog tax, and a fee of \$5 may be charged hawkers and peddlers. Estimates of expenditure for improvements, etc., are presented and passed at the annual meeting. The Village Ordinance has been taken advantage of to a considerable extent.

SYNOPSIS OF THE LOCAL IMPROVEMENT ORDINANCE.

A brief synopsis of this ordinance may perhaps be given with advantage. It may be stated that the old title of Statute Labor Ordinance was for the purposes of euphony changed to the Local Improvement Ordinance, certainly a slight "improvement" in itself. It was found that "statute labor" grated.

All owners or occupiers of land over 18 years of age, corporations, companies or partnerships are liable to the tax. The overseer holds office for a year. The annual meeting of the residents of the district must be held between the 15th of March and 7th of April. At this meeting the overseer is elected by a poll. In the event of no election, the Commissioner of Public Works may appoint. The annual meeting also elects an auditor and decides what improvements are to be made and implements purchased. The work decided on may include not only fireguards or road improvements, but the destruction of noxious weeds on unoccupied lands in or adjoining the district. The overseer in case of emergency may spend a sum not exceeding \$25. The assessment is at the rate of \$2.50 for the first 100 acres and 62½ cents for each 40 acres over or above. The overseer has to prepare a proper assessment roll, and the original must be open for inspection at his residence. The tax may be commuted by labor. Persons wishing to thus commute must give notice to the overseer, who will then notify when and where to do the work. If within five days the work is not done, the defaulter is liable to pay \$2.50 more over and above the original taxes. No person can be compelled to work more than three miles in a direct line from his house, unless he has given his consent thereto in writing. The overseer can require a cart, wagon, plow or scraper, with a pair of horses, mules or oxen, and a man, from any person having the same within his district who has been assessed \$2.50 or elected to commute. A day's work is eight hours. The returning officer receives a fee of \$5. The overseer works out his own assessment in overlooking, and receives \$2 a day for each additional day. All works affecting roads, culverts, drains, bridges, etc., must be performed in accordance with a manual of instructions issued by the Commissioner of Works. All the labor in the district must be performed previous to the 24th of July; but work can be done at other periods of a year, if so decided by a two-thirds vote