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Soil Fertility.

Wheat is king! The rapid development of this great West is in a large measure due to its marvellous wheat-producing capabilities. Generally speaking, the soil and climatic conditions are peculiarly well adapted to the production of large yields of wheat of the very highest milling qualities, and on account of the low price of land and the ease with which it can be got under cultivation, and the improved modern machinery for cultivation, seeding, and harvesting, the cost of production is reduced to a minimum, and with ordinary "luck" and decent prices more money can be made out of wheat-growing in less time and with less capital than any other branch of farming.

During the early days of settlement the impression commonly prevailed that the fertility of our soil was inexhaustible, and to a certain extent this is no doubt true with some of the deep black clay loams on clay subsoil. Instances are not lacking in many districts where land cropped almost continuously without the application of manure for 15, 20, or even 25 years, produces as abundant yields of first-quality wheat to-day as in its virginity. Yet, while this is true, the great wheat fields of the country are, as a general thing, showing the effects of continual cropping in reduced yields. The experience of the wheat-growing prairie States to the south of us has been almost exactly similar to our own. It was wheat just as long as the soil would stand it, then the bare fallow was adopted to hold the weeds in check, conserve moisture, and liberate a fresh supply of latent plant food, and stimulate the soil for further effort. But now throughout these States the pendulum is swinging from wheat and all wheat to grass and stock, fencing and crop rotation, in an effort to restore to the soil some of the fertility it had when first taken from nature's hand, in order that wheat-growing may continue possible

In the exclusive wheat sections one frequently hears exprsssions like the following: "Manure! impossible! The areas under cultivation are too extensive to permit of such a thing. Stock can't be kept on account of the expense of fencing, of buildings, the labor involved, and besides, there is no pasture, no grass; in fact, this is the best of wheat land, and is too good for stock-raising."

In our last issue was published an address on "Why the Farmer Should Raise Improved Stock," by Mr. Henry Wallace, who has had long experience in agricultural matters in Iowa. There are many good things in that address, and it's well worth reading a second time; but one paragraph fits our text so aptly that we cannot forbear re-quoting it:

"As a matter of fact, the farmer does not grow live stock until he is driven to it. All new agricultural countries, and nearly all new farms, are opened up by grain-raisers. The grain-growing habit, when it has become fixed, usually continues until the farmer is by force of circumstances driven to growing stock. As a rule he avoids it as long as he can. When waning fertility is observed he tries a rotation of grains, and, this proving a failure, is finally driven to grass, and then forced to grow stock to consume it, forced to fence, to build, to grove not merely his home, but his stock yards, to study the habits and appetites of animals, the science and art of breeding, the food value of grains and grasses—in other words, the science and art of mixing feeds, or the balanced ration. It is either this or the impoverishment of the land, and sooner or later a mortgage, a death grip, for that is what the word mortgage means, and, after that, migration to a new country or falling down from the position of owner to renter, and finally to that of a hired hand. It should be thoroughly impressed upon the minds of farmers that there is, under Western conditions, no such thing practicable as maintaining the fertility of land without live stock."

True, every word of it; as true for Manitoba and Assiniboia as for Iowa or Minnesota. Recently the great railroad companies whose lines intersect the States of Minnesota, the Dakotas, and Montana, immediately south of us, put into effect a half-rate tariff on grass seeds to points on their lines in these States; a significant move, and one that might well be followed by our own railroads.

Grass it must be. Light soils cropped and fallowed and cropped again, drift from lack of root fiber and humus, which can be supplied by laying down to grass. Heavy clay soils get sticky, run together, dry out, bake and crack for lack of root fiber and humus, which can be supplied by laying down to grass.

With grass, cattle will follow to utilize it, and with cattle, the by-products of wheat, straw and bran can be utilized, and manure made as a by-product of stock-raising, which, returned to the soil, will enable continued successful wheat-growing. Wheat as king, and grass as queen. Occasionally some scientist startles us with a marvellous story of some commercial fertilizer, a sprinkling of which will make the worn-out fields fruitful once more, but whatever nitrates or other chemicals may do for us, they cannot take the place of grass, live stock and manure.

This question of the conservation of soil fertility is of pressing interest, and in this issue will be found a number of most interesting letters from practical men on different aspects of it. Let the discussion go on.

Breaking Up Scrub Land.

A subscriber in one of the newer districts in the northern part of the Province asks for advice as to the best system of breaking such land as he has. He describes his conditions briefly, as follows: "The land is rolling, with more or less scrub and timber; about 18 inches of black loam on the surface, with a subsoil of clay averaging about same depth, with gravel and sand under the clay. There is really no sod; the surface is hummocky and breaks easy, and the vegetation of the district indicates that there is ample moisture."

In scrubby land, breaking cannot be done as shallow as on the open prairie, where the sod is level and tough. On such hummocky ground as described, the breaking must be done 5 or 6 inches deep at least in order to make a complete job of it, and by turning over such a deep solid furrow nearly all scrub and roots will be cut and turned well under. Such land broken before the 1st of July, if well disked and sown with oats or barley, will likely give a good return in fodder. Barley might even be sown on land broken as late as July 15th. Oats cut green just when the top grains of the heads are turning make the very best of winter feed. Flax sown on spring breaking, at the rate of a half bushel per acre, generally gives good returns in Southern Manitoba if sown by June 1st, but we are unable to say how it would do in the more humid districts of the north. It might be sown as late as the end of June, and if it did not mature it makes good feed in limited quantities fed in the sheaf. Heavy rolling is, of course, of great benefit to all breaking, and the rougher the land the greater the benefit would be. Land broken deeply and cropped with oats would likely be clean and free from weeds, and if the crop could be cut low so as to leave little stubble, a thorough disking would probably be all the cultivation necessary to secure a good crop of wheat or oats, thus postponing the backsetting or second plowing for another year, by which time the scrub roots and surface rubbish turned under would have become pretty well rotted and give little subsequent trouble. A firmer seedbed for the second year is thus obtained. We would advise rather heavier seeding than for ordinary cropping, as it smothers weeds better. If shoe drill cannot be used, disk in seed, except, of course, flax. A heavy chain harrow can be used with great advantage on scrub land, but the ordinary drag harrow drags up roots, etc., which interfere with drill and also with harvesting. We have known land very similar to that of our correspondent, along the south-eastern base of the Riding Mountain, north from Neepawa, treated as above with satisfactory results; as also some land in the Winnipeg districts.

Another correspondent describes his system of treating the low, flat, heavy clay land, of which there are considerable areas in the Red River Valley, as in other districts.

BREAKING UP FLAT, WILLOWY LAND.

All such land requires more labor than high-ridge land; not only in breaking, but long after it has been under cultivation. My system has been to break such land as soon after seeding as possible, and sometimes in a wet spring even before, having first brushed off the willows with an old mower, if not too large, or else a brush hook; then we have a fourteen-inch breaker with brush colter, and break from 3½ to 4 inches deep. Then, as soon as possible, we disk harrow two or three times both ways. Next, take spring-tooth harrow, which shakes out large numbers of the roots; then the drag harrow to make an even seed-bed. On such land I find that oats do much better than wheat for at least two years after breaking; then wheat for two years more, followed by summer-fallow. Before cropping with wheat, manure the lowest spots freely, which brings them into good tilth earlier, although I have found nothing equal a bare fallow for such land. I should have said at the outset that unless this kind of land is surface drained, and the water carried off as rapidly as possible, it would be very risky to depend on it every year for a crop. If broken for the purpose of seeding to grass, then it might be all right with less care in draining.

Springfield Municipality. ED. ANDERSON.

HOW BEST TO HANDLE SCRUB LAND.

At a first glance the owner of a scrub farm is apparently at a great disadvantage; but this is largely imaginary, for if the scrub is free of thorn and oak roots it is readily brought under cultivation, and no class of land is more productive when once cleared. If the scrub is composed of large willows or poplars it will be necessary to use the axe, but with a scrub plow furnished with an upright socket colter, and a four ox or horse team, quite large willows and poplars can be rooted up. Instead of plowing shallow, as is done in breaking up prairie, it will be necessary to turn up the soil several inches deep, depending largely on the size of the scrub. No backsetting is required, but, instead, a frequent use of the disk and tooth harrow, followed each time by the gathering of the roots, scrub, etc. Where the scrub is thick a chain is often used to drag it into heaps; others prefer a rough rack mounted on a sled or low wagon.

Only stiff and short-strawed varieties of grain should be grown on this class of land, as its tendency is to grow too much straw. A grass rotation will prove a benefit in checking a rank growth; nearly all varieties of grass succeed on scrub land. I have never seen a paying crop of farm produce grown on prairie soil the first year; but on scrub land, cleared early in the season, it is possible to raise a fair crop of either vegetables, fodder, or even grain, although, generally speaking, it is more profitable to spend the first season in clearing land, erecting buildings, and putting up hay.

S. A. BEDFORD,
Supt. Experimental Farm, Brandon.

To Check Manufacture of Home Dairy Cheese.

MR. EDITOR, I noticed Dairy Commissioner Murray's letter in the FARMER'S ADVOCATE condemning the manufacture of dairy cheese. That is very well, as far as it will go; but in order to accomplish something we must do more than write about it. The most practical way of discouraging the manufacture of this stuff is, in my opinion, to do away at once with the dairy course in cheesemaking in the Dairy School, because, in my opinion, the Dairy School has of late years been an important factor in the development of this undesirable industry. Young men and women come to the Dairy School for a few weeks and go home with the idea that they can make first-class cheese. Closing that course is the first step in the right direction. A CHEESE DEALER.

[Superintendent Murray informs us that no instruction was given the non-professional students at the Dairy School this winter in cheesemaking. In the professional course instruction in cheesemaking is, of course, given. ED. F. A.]