The Farm.

Corn Culture.

Before you study how to cultivate your corn, you should learn its value as an article of food, and you will then know how many acres you should plant. Another phase of the question is that corn is a cleaning crop, and therefore ranks with roots as a method of destroying weeds. In practice it will not do to urge that corn requires a clean soil so long as part of your land has been neglected and allowed to run to weeds; for a corn crop is one of the most efficient methods of destroying them.

Practical farmers differ widely in their estimate of the feeding value of corn, and we must depend upon science for a solution of the problem. Corn is valued chiefly for the quantity of fat it contains, it being deficient both in nitrogen and in minerals, especially lime, a chief constituent of bone, so that when fed with foods rich in these constituents and deficient in fat, such as bran and peas, it will produce excellent results, but when fed by itself or with bulky foods, the results will be unsatisfactory.

Many farmers attach a good deal of importance to corn stalks and leaves, which are said to pay for the cost of raising the corn; but when it is considered that such food is a nuisance about the premises, and that the farmer has too many other kinds of bulky foods, their value is doubtful. So long as Canadian farmers can successfully grow other kinds of fodder crops, we would not advise them to go extensively into corn culture. It is not a valid argument to say that a large number of tons per acre can be raised, for the nutritive properties are proportionably less. However, corn possesses advantages as a soiling crop, if not required in too large quantities, for it is a rapid grower, stands drought well, and can be utilized later in the season than many other crops.

A light, warm soil is best for corn. If the land is naturally somewhat cold, either by want of drainage or by the natural heaviness of the soil, an application of horse manure will be specially beneficial. The best results in yield can be obtained by letting the plants grow singly, but as the main object usually is to clean the land, it is desirable to plant in rows, say 3½ feet apart each way, so that the crop can be cultivated to the best advantage. The old grand-pa practice of hilling up has been wisely abandoned by our best corn-growers. As soon as the corn makes its appearance above ground, plow the soil moderately deep, away from the plants, on each side of the row and in one direction. After 6 or 8 days, plow in the opposite direction, turning the soil away from the plants as in the first plowing. The hills will now be found in flat squares, and 3 to 5 plants may be left in each hill, more plants being left in a light than in a heavy soil, providing the former is well manured. These plowings do not interfere with the roots, for the roots have not yet much development. After the roots begin to penetrate into the furrows, the cultivator should be used, and the rows cultivated in both directions, thus rooting out the weeds between the rows and smothering those lying close to the plants. If the land is afterwards cultivated, it must be done very shallow, so as not to disturb the roots, for the root pruning of corn has never produced favorable results.

This method of cultivation possesses two advantages: (1) it is most favorable to the destruction of weeds; (2) it affords warmth to the roots of the young plants, which is favorable to their development. Bear in mind that the taller the corn the shallower should the ground be cultivated.

Farm Drainage.

No. IX.

Lateral Drains.—While laying out the main drain it is important to glance at the land on both sides in order to see how the laterals should enter. Here the acutest judgment of the drainer is often exercised. In point of economy and efficiency it is desirable, when practicable, to run the laterals parallel to each other and directly down the slope into the main; but very few fields are so configured as to admit of the strict application of this rule. Some run the laterals at right angles with the main, others run them at an acute angle, but the direction is of little consequence providing the laterals run directly down grade and the entrance into the main be not at too large an angle. The angle at which the lateral enters the main must be considered in connection with relative velocities of the flow of the two streams. For example, if the water in the lateral flows more rapidly than that in the main, and the junction is made at right angles, it is evident that the flow of the resultant stream will be checked, whereas the aim should be to have the flow as regular and smooth as possible. The question now is, how can the junction be made in order that the two streams may glide as smoothly and gracefully into each other as possible? By doing so the durability and efficiency of the drainage will be materially increased. The object should be to cause the two streams to accelerate the flow of each other, rather than cause obstruction, and this end can be accomplished by causing the joining streams to have the same general direction. This object can be attained in two ways: (1) By running the laterals at a sharp or acute angle with the main, herring-bone fashion, and (2) by running the laterals at a large angle, but using curved tile at the junction. We prefer the curved tiles, especially when the lateral stream has considerable velocity, the flow thus being gradually checked before it can obstruct the flow in the main, and the two streams blend together more smoothly than when the entrance is made at an acute angle; but where the laterals can be made so as to enter straight into the main at an angle of not more than 30 degrees, the junction piece comes very useful; that is, a tile made with a lateral piece attached and fitted in at an angle of 45 degrees. By the use of the junction pieces, the lateral water enters underneath the main tile, and the angle need not be made so acute as in the ordinary method of forming the junction. When the angle is over 60 degrees, it is necessary to use the curve.

It is sometimes necessary to change the direction of a drain in order to evade the roots of trees, which are apt to enter the joints of the tile and choke up the drain. Roots are inclined to run in the direction of the drain, and the roots of some trees, such as the poplar, elm, and willow, are more destructive to drains than those of other kinds. In general, it is advisable to cut down all such trees within 50 to 70 feet away from the drain, according to the nature of the subsoil.

Mapping out the Field.—So long as the drains are few in number and run in a direct or well-defined course, the farmer may be able to retain their location in his memory; but the practice is a slovenly one, and should be abandoned. We know farms that have greatly depreciated in value on being sold on account of the owner not being able to define the location of the drains. When levelling the land, it is an easy matter to preserve the field notes and other observations in a note book kept for the purpose, and such a practice should not be branded as "book farming." It is better to suffer the stigma of being called a "book-farmer" than to allow your valuable drains count for nothing when your land is sold.

In connection with the field notes, a map of the drained land is necessary, showing the contour of the surface, the obstructions, the high land, the low places, the angles of juncture, etc. The most comprehensive way is to draw the map on a large scale, say one inch to 50 feet, in order that various notes may be distinctly written on the map, such as the fall of each drain, the direction to certain points of the compass, etc. The lines representing the drains show the direction of the slope, but where the drains do not run directly down the grade, the direction of the grades should be represented by arrows pointing straight down the slopes, and if a part of the field remains undrained, it should be levelled, the courses of the proposed drains noted by dotted lines, and the rates of inclination marked. As fast as the drains are completed, these dotted lines may easily be changed into continuous ones. By these arrangements the planning can always be done in advance, and the parts most in need of drainage should be so marked as to demand the earliest attention.

Guarding the Outlet.—We have already spoken of the necessity of securing a free outlet in order that the flow may not be obstructed. We shall now see how the outlet should be protected. No amount of pains and expense in the construction of the drains will compensate for a defective outlet. If there is an obstruction at or below the outlet, the pressure of the drain water will overcome it, providing the top of the obstruction is not higher than the source of the drain, but it should be borne in mind that the land lying between the drain and the level of the source is not drained, and the tiles will be of no more use in draining the soil than a long iron pipe which has no joints. With regard to the protection of the outlet, the case is so ably and briefly summoned up by Prof. R. C. Carpenter that we give his description in his own words, which are as follows:

"The outlet to under-drains should be protected by some construction that will prevent the earth from falling in front of the drain. The best construction is a retaining wall of masonry laid in hydraulic cement. There should also be a coarse grating in front of a tile drain to prevent vermin from getting in. Coons, muskrats, and rats have been known to run up tile drains as far as they could go, and finally get lodged, and form an obstruction to the flow of water. The outlets should be free; that is, above the surface of still water, as standing water in a drain is liable to cause a deposit of silt. Common porous tiles should never be used for an outlet, as they are des-