

if manured, I would advise the working of the manure in with the land, rather than manuring in drills in spring and splitting. The land should be ploughed early, and kept well stirred until ready for planting, for as we force forward the weeds and kill them off at an early date, so will our trouble be the less in keeping the after crop clean.

Doubtless the best plan of cultivation is by autumn ploughing and manuring. The manure is thus thoroughly incorporated in the soil, the spring work is lightened, and the action of the winter's frost followed by the cultivator and harrows in spring, will be certain to secure a thoroughly pulverized and clean seed bed. The plan very generally adopted in England answers well in our soil and climate. In the fall the land is ploughed and ridged up 26 inches apart, and the manure spread in the drills. These drills are then split before winter. In the spring all to be done is to again split the drills in which the manure has lain all winter, and we are ready to plant. These drills will work very fine, for the frost has thoroughly penetrated them, and we thus save a great deal of time in spring, our "thronging" season. A liberal supply of superphosphate of lime (but it must be genuine), will be amply repaid in crop.

The rows should be at least 26 (or in rich, well prepared land, 30 inches will be none too far), apart. The seed may be either drilled upon top of each row, or dibbled in at intervals of from 15 to 18 inches. Sow about the first week in May, thus escaping the frost; moreover, if sown too early, the root is apt to run to seed early in the fall. From 4 to 6 pounds per acre should be used, and if damped for three or four days previous to use, it will sprout far earlier. In Canada the dibble is too expensive a process; drilling and thinning becomes our only practical plan. The seed is very easily buried, and should not be covered by more than half an inch of earth. Two or three plants generally spring from each grain of seed, and great care has to be exercised in thinning that we leave our plant firmly rooted.

The after cultivation is such as applies to all root crops. Keep the land thoroughly clean, and wage perpetual war upon all weeds. They must be harvested early, before there is any chance of frost, for this root is very tender and easily frozen. Many growers recommend that the mangold be not tailed when taken up; and when the land is light and the bulb pulls up, clean tailing is an unnecessary addition to the trouble of harvesting. The chief drawbacks, then, to the cultivation of the Mangold are that more labour is required in the thinning, and that they are extremely susceptible to the effect of frost. It may assist us in making a comparison of the two principal root crops, to place side by side the peculiar advantages possessed by each—Mangolds and Swedes—as practical field crops:—

THE MANGOLD WURZEL.

1. Is neither liable to "fly" nor to "wire-worm."
2. Produces a greater weight of root per acre.
3. Does not taste the better when fed to milk cows, and is a better and stronger food in late winter and spring.
4. Will grow on *stiff* land with more certainty than the turnip.

THE SWEDE.

1. The "thinning out" is less expensive.
2. Can be planted later.
3. Is less liable to be hurt by frost.

C. E. W.

Soils.

Doubtless the real value of any particular course of cropping depends greatly upon the manner in which the rotations are practically carried out; but, at the same time, the nature of the soil should be carefully considered before the farmer commits himself to the raising of a large proportion of any specific product, as different varieties of soil are specially adapted to the growth of particular crops.

The following table, comprising an analysis of the component parts of different soils and their adaptation to special crops, is compiled by Thaeer from the results of many years careful examination:—

	Clay, per cent	Sand, per cent	Lime, per cent	Vegetable Mould per cent.
1st class wheat lands..	51 to 40	64 to 22	to 4	5 to 4
Good do.....	58 to 58	36 to 30	2 to 12	4 to 2
Passable do.....	60 to 68	38 to 30	..	2 to 2
1st class barley land..	20 to 38	67 to 61	..	2 to 2
Ordinary barley land..	33 to 28	65 to 70	..	2 to 2
Good oat land.....	23 to 18	75 to 80	..	1 to 1

Thus, best wheat lands are those with a large proportion of clay, when mixed with, and thus rendered more mellow by, a large supply of vegetable mould. Lime must be added where it does not exist.

Best barley lands are those which contain a large proportion of sand, mixed with sufficient clay to give it retentive powers.

CLAY.

The most special characteristic of soils that come under this head is their power of retaining water. It is this faculty which forms the chief difficulty to the farmer, and which makes it obligatory upon his part to

work such land with much care and caution. Clay must not be trod upon by horses nor touched with implements when wet. We may plough our lighter lands in a moist state with comparative impunity; but with clay an immensity of actual harm will result from such a course, and the land will be left in a state from which it will take many months to recover.

There is a great diversity of opinion as to the proper manner of ploughing heavy land. There are many who advocate narrow lands set up high in the crest. The advantages of this system are two-fold; more surface is exposed to the weather, and there being a greater number of furrows in the field, the water gets away with more rapidity. On the other hand, if the lands be wider and more gradually rounded, the water has a tendency to percolate the surface soil, and after a heavy rain is not apt to rush off in a sudden flood, doing no good to the soil, and digging deep trenches in every water furrow. This is a point on the consideration of which each farmer will do well to ponder, endeavouring to strike a happy medium—to have his ridges sufficiently rounded to prevent water stagnating, and at the same time to give the shower sufficient foothold to percolate through the surface before reaching the furrow and rushing away.

No farmer of the present day doubts the efficacy of under-draining, even though he may not have put it in actual operation. There is no need to enter into this question here, but I would say that the advantages of drainage to clays are almost unlimited. No plant will thrive in land that retains superfluous or stagnant moisture, for the instant water becomes stagnant it ceases to be of any value, and indeed becomes positively injurious.

Clays rest upon very different sub-soils; some rest on gravel. In such, stagnant water may be very materially reduced by opening holes in spots where rain collects in pools, deep enough to reach the gravel, and filling them up with gravel.

Drainage gives warmth to the land and to the air above it, and thus ripens the crop early and perfectly.

The next most important aim of the cultivator of clay is to counteract the tendency which such soil has to run together. The first means by which to attain this desirable result is by deep ploughing. Each step taken by the furrow horse in ploughing increases the hardness of the sub-soil. Now, after ploughing a piece of land year after year, and turning up each time the same depth of soil, we are each year increasing the compactness of this pan, and making it so close and hard that it becomes perfectly impervious not only to water but to the tender rootlets of the growing plant. If, however, we plough deeply in the Fall, and shallow in the Spring, we are adding soil to our seed bed, and protecting this naturally hard pan.