

Agricultural.

Farm Drainage.

O. Foster, in Utica Herald.)

That there is at some periods of the year, on a large per cent. of the lands of this country, a large surplus of water, is undisputed. Why it is that farmers are so slow to see the advantages to be derived from a system of drainage, is almost beyond comprehension. It is presumable that farmers, like men in other pursuits, would be ready to adopt any honorable means to benefit their financial condition. But when the subject of drainage is introduced, the objection is raised at once that it is too expensive. Most farmers will admit that their lands have too much moisture. Now the probabilities are, that we do not, as a rule, have too much rain fall, but we fail to prepare our lands to be benefited by its fall. French, in his work on farm drainage, says:—"Rain is the principal source of moisture, and a surplus of moisture is the evil against which we contend in draining. But rain is also a source of fertility, not only because it affords the necessary moisture to dissolve the elements of fertility already in the soil, but because it contains in itself, or brings with it from the atmosphere, valuable fertilizing substances. Rain water always contains, in solution, air, carbonic acid and ammonia. The two first ingredients are among the most powerful disintegrators of the soil. The oxygen of the air and the carbonic acid, being both in a highly condensed form, by being dissolved, possess powerful affinities for the ingredients of the soil. The oxygen attacks and oxidizes the iron; the carbonic acid seizing the lime and potash, the other alkaline ingredients of the soil produces a further disintegration, and renders available the locked up ingredients of this magazine of nutriment. Before these can be used by plants, they must be rendered soluble, and this is only affected by the free and renewed access of rain and air. The ready passage of both of these, therefore, enables the soil to yield up its concealed nutriment." Now, if these premises are correct, you will readily see the necessity of underdraining; for open ditches or surface draining will not accomplish the object sought. I am aware that many farmers insist that open ditches are sufficient to drain their lands. Let us examine this surface draining and see if it is sufficient to relieve the land from the surplus water, or to be benefited by the falling rains. I take the position that open ditches will not drain lands unless it be a very loose, mucky soil; nor that only for a limited time. For, in my experience and observation, I have seen very often, as I doubt not many of you have, water standing near the banks of an open ditch, and a foot or more above its bottom, day after day, with but very little diminution in quality; an evidence that that ditch was not draining that field. A few years since a neighbor of mine had a flat piece of land through which there was an open ditch, and the water lay along each side of it nearly as much as though there had been no ditch there, and he could not succeed in getting a fair crop of anything. I advised him to deepen his ditch and put in drain tile and the difficulty would be removed. He seemed quite skeptical at first, but finally put in the tile, after which he was wonderfully surprised at the effect a single under-drain had on that piece of land, the water all disappearing for quite a distance on either side of the drain. Again, a townsman of mine, owning a very excellent farm near a village, and on which there was, by the side of the highway, a low, wet piece of ground that marred the good looks of the farm considerably, and seemed to annoy the owner very much. I advised him to under-drain it. He thought that it could not be drained; for, said he, the land will hold water as well as an iron kettle. I said, in reply, that if he would spend one day in digging, he could ascertain very nearly whether under-drains would draw the water. As he was very anxious to improve that particular spot, he concluded to make the experiment. He employed a man or two, and, on the morning of the second day, to his great surprise and gratification, the water in the vicinity of the ditch had all disappeared. I might say more about this case, but it is not necessary for my present purpose. I relate these circumstances as evidence that open ditches will not drain lands—that under-drains will. Water running off on the surface tends to impoverish the soil, by taking with it much that should become food for plants, and is not enriched by the falling rains. Again, open ditches must be re-made or repaired every year or two, in order to maintain a water course. They are a great inconvenience in doing the work in fields or

where they exist. Upon a crop of Indian corn, the cold water lurking below soon places its unmistakable mark. The blade comes up yellow and feeble. It takes courage in a few days of bright sunshine in June, and tries to look hopeful, but a shower or an east wind checks it. It had already more trouble than it could bear, and turns pale again. Tropical July and August induce it to throw up a feeble stalk, and to attempt to spindle and silk like other corn. It goes through all the forms of vegetation, and yields at last a single nubbin for the pig. Indian corn must have land that is dry in summer, or it can not repay the labor of cultivation. Careful attention to the subject will soon teach any farmer what parts of his land are injured by too much water, and, having determined that, the next question should be whether the improvement of it by drainage will justify the cost of the operation. The advantages of under-drains are quite numerous, and it would be too much for an evening's discussion to enumerate and illustrate all of them. But we will endeavor briefly to give a few that seem most prominent. First, then, they relieve the soil of the surplus water, being perpetual workers, summer and winter, if there is anything in their line to do. In the spring, when the snows begin to melt, the water finds its way to the drains, and is passed off; so that our lands are much earlier in condition to work, and also to receive the seed. They insure a crop against excessive wet, as also against severe drouths. The question is often asked: Will it pay? French says "drainage is a permanent investment. It is not an operation like the application of manure, which we should expect to see returned in the form of saleable crops in one or two years, or ten at most, nor like the labor applied in cultivating an annual crop. The question is not whether drainage will pay in one or two years, but will it pay in the long run? Will it, when completed, return to the farmer a fair rate of interest for the money expended? Will it be more profitable, on the whole, than an investment in bank or railway shares, or the purchase of western lands? Let us bring out this idea clearly to the farmers of Central New York. Your field is worth to you now one hundred dollars an acre. Suppose, now, it cost one-third of a hundred dollars an acre to drain it, what must the increase of your crops be to make this a fair investment? Had you expended one third of a hundred dollars in labor, to produce a crop of cabbages, you ought to get your money all back, with a fair profit, the first year. Had you expended it in guano or other special manures, whose beneficial properties are exhausted in some two or three years, your expenditure should be returned within that period. But the improvement by drainage is permanent; it is done for all time to come. If, therefore, your drained land shall pay you a fair rate of interest on the cost of drainage, it is a good investment. Seven per cent. is the most common rate of interest, and if, therefore, each three acres of your drained land shall pay you an increased annual income of seven dollars, your money is fairly invested. This is at the rate of two dollars and thirty-three cents per acre. How much increase of crop will pay this amount? In the common rotation of Indian corn, potatoes, oats, wheat or barley, and grass, two or three bushels of corn, five or six bushels of potatoes, as many bushels of oats. A bushel or two of wheat, two or three of barley, will pay the bill. Who that has been kept back in his spring's work by the wetness of his land, or has been compelled to replant because his seed has rotted in the ground, or has experienced any of the troubles incident to cold, wet seasons, will not admit at once, that land which nature has not herself drained, will, in this view, pay for such improvement? By lowering the water line in the subsoil, the various crops take root much deeper, consequently making a much stronger and healthier growth, thereby increasing the quantity and improving the quality of the crop. Under-drains relieve the land from stagnant water that is so disgusting to the sight and are prolific sources of disease to the human family, as well as of putrid milk, so much complained of among dairymen. These same waters that become stagnant by standing on the surface of the land, by being filtered through the soil, and conveyed in an under-drain to a convenient point, afford an excellent privilege for watering stock. The other part of the subject that has been submitted for our consideration, viz.: the best and most economical method of constructing the drains, and material to use, I shall say but very little about. The majority of farmers who drain at all, have their own ideas as to what is best for them. In my own experience I have tried various methods for digging ditches, such as plowing out from one to two fur-

rows on top, and then using the spade and narrow scoop to complete the ditch. Have used a subsoil plow for loosening the earth; have used other devices with a view to save expense, but have come to the conclusion that if the work is to be done mainly by hand, the better way is to do the entire work by hand. The less the earth is disturbed in making ditches, the better the result. If hand labor is employed, and drain tile are to be used, I would suggest that suitable narrow tools be procured to make a narrow opening, thus taking out a comparative small quantity of earth, consequently having but little to return. As to the material to be used to construct a water course, there is but one that I recognize as durable, efficient and reliable, and that is hard burnt drain tile. If properly laid, and there are no trees growing near enough to send their roots into the joints of the tile, I know of no reason why the drain should not last for ages. I am aware that some farmers advocate the use of stone, for the two-fold purpose of making drains and, as they claim, disposing of their stone to advantage. In my experience I have found stone drains quite expensive and very unreliable. They are quite liable to become choked up by the washing in of sediment, or from the workings of mice. It will take from one to two loads of stone for each rod of ditch, while one or two loads of tile will lay from fifty to seventy-five rods, depending on the size of the tile. Then, again, it requires about three times the amount of excavation that is required for tile. Some have used boards, but as I know little or nothing of their utility, I will not speak of their comparative merits. I have said nothing in regard to the depth of drains, for the reason that soils differ so much. It would be difficult to fix upon any uniform depth that would be suitable for all soils and circumstances. I will say, however, that on my farm I have put tile down 30 inches; and that depth seems to be sufficient to dry my land, which is principally a sandy loam soil, with a mixture of clay and sand, or, in some cases, gravel subsoil.

The Island of Jersey—Crops and System of Farming.

Pasturage is the prime dependence of the Jersey farmers. In the valleys we find water meadows or irrigated fields, which yield one or two, sometimes three hay crops, and are always available for fall or late summer pasturage in case a drouth comes on, as is the case at this time. All other land which is capable of cultivation is available for pasture at different times in each rotation, and upon such land cows are almost invariably tethered. The system of cultivation is not peculiar as a whole, but I noticed some curious practices which may possibly be followed with profit. One is this: After an early potato crop, dug by the 1st to 20th of June, the ground having been thoroughly enriched for the potatoes, rye-grass, clover and turnips are sown together. By the 1st of August it is ready for feeding off, and the cows are tethered upon it, the turnips being pulled and fed in the manger at night after milking. These, it is claimed, impart no perceptible flavor to the milk and butter. It is quite likely no flavor is given to the morning's milk alone or both the morning's and noon-day milkings are sold, and only the night's milk is saved for butter and for family use. A field seeded in this way, and when we saw it—three-quarters fed off—looked well set with both grass and clover, while the turnip crop on the portion not yet cleared was a very good one.

Lucerne is growing in favor, notwithstanding it imparts a disagreeable "green" flavor to the milk, and is not greatly relished by the cows. Young stock thrive upon it, and it is excellent for both soiling and hay.

JERSEY KALE.

There is a kind of cabbage grown chiefly for pig-feed, which is quite remarkable. We noticed on our first arrival that in many shops they offered or exposed for sale at the doors and windows singular looking canes, which, on close examination, I discovered to be very like cabbage stalks, and on enquiry, learned them to be such in fact. This kale grows to a really enormous height sometimes. That the stalks make good walking sticks is not surprising, when we know that the plants not unfrequently reach a height of 8 to 10 feet, and occasionally even 12 or 15. I have stood under those which were so high that I could not reach the lowest leaves. The seed is sown in the autumn, and the plants set out the same season in good soil, about 14 inches apart. They are fit for