

pursued. Stirring the sub-soil, but leaving it still underneath is what would be advised in such a case. By doing this, and liberally manuring the top-soil, the sub-soil would gradually become enriched by the percolation into and through it of the ammoniacal moisture, supplied by rain, which in its passage down through the soil took with it the soluble portions of the manure. If a soil is to be deepened by bringing a poor sub-soil to the top, the process must be very slow and gradual, no more being raised at a time than can be enriched and made good. When it is proposed to grow Indian corn on a ploughed sward, there is no use going down deeper than the grass roots, which of course form a sort of mat on the surface. But there is no corn ground equal to the Virginia prairie and the rich river bottoms of the Western States, and the depth of these soils is proverbial.

No stiff unvarying rule can be given as to the depth of plough. The character of the land must be studied, and the ploughshare graduated to its condition. A deep rich soil should be the thing aimed at. To grow all sorts of crops, and especially to grow root crops in their best luxuriance, both depth and fertility are needed. It would be sheer nonsense to attempt to raise good carrots, mangolds, or turnips in three inches of soil: whatever our neighbors across the lines may do with their big corn crops, we, in this country know very well our success in farming depends mainly on our pursuing a rotation in which root-growing must play a prominent part. Without root crops we cannot raise and feed stock to advantage, and unless we can keep plenty of stock we cannot have manure. We have no doubts or misgivings as to the beneficial effect of deep tillage *provided always*, that the soil be enriched as we deepen it, and that the best of it is at the top, where crops need stimulating into quick growth during the earlier stages of plant life.

To Avoid Cut Worms in Corn.

This is the experience of a man in Indiana, as told in the Cincinnati Gazette.

"A few years ago my father had a fifteen acre field, well set in timothy, which he wished to put into corn. We commenced breaking it up in February, and finished before the grass began to grow. When the ground was dry we harrowed it, and cross harrowed it until it was in fine order, being almost as dry and free from clods as an ash heap. We planted in good time, and it came up nicely; but the cut worm destroyed it all, so that it had to be planted over again, and then replanted after the second planting, before we could get anything like a fair stand of corn.

"Our neighbor had a field just across the fence of about the same size. It was on the same slope, and was the same kind of land exactly. It had been in timothy the same length of time that our field had. He broke it up late in the spring, and planted it to corn the same day that we did. The grass had gotten such a start, before he commenced breaking up, that after the field was planted it looked almost as green as a pasture. His corn came up nicely, and there was so little of it destroyed by the cut worms that he did not take the trouble to replant it.

"He raised a good crop of corn on his field while we raised a poor one. His good natured remark was that he fed his cut worms on grass instead of corn."

Potato Blight and Rot.

Dr. Thomas Taylor, of Washington, D. C., communicates to *The Lens* the result of experiments upon potatoes, from the examination into the chemical and structural theories of Dr. Lyon Playfair and the fungoid views of several leading mycologists.

Among other tubers, one-half of a potato brought from Santa Fe, New Mexico, was placed in water with a diseased specimen and the other half in water to which sugar had been added. An Ohio potato was similarly arranged, and the effect of allowing it thus to remain for a considerable period noted. On the twentieth day, the Ohio specimen had entirely dissolved, while the Santa Fe potato was uninjured. Comparing the portions in the sugared water, the Ohio tuber appeared a mass of infusorial life, mycelium, and budding spores, with a strong odor, no starch cells being discernible.

The New Mexico specimen showed few infusoria, and the starch granules arranged in cellulose, between

which bundles of mycelium and budding spores appeared in profusion. No liberated granules were visible. Since these experiments, other northern and eastern varieties have been tested by fungoid solutions in contrast with some of the New Mexican varieties giving by results, clearly demonstrating the superiority of the Santa Fe potatoes, over all others thus far examined, in respect to their power of resisting fungoid and infusorial action.

We note that the government is about to test, by samples of every variety of potato from the above mentioned locality: their anti-fungoid qualities in the open field and in contrast with the usual varieties grown in the section of the country.—*Scientific American*.

Rolling the Ground.

A correspondent of the *Germania Telegraph* writes: "On dry or wet ground the effect of the roller is found to be salutary. Ploughed and prepared for sowing, dry land is much helped by the roller. The blades of grass spring up sooner and retain a firmer hold in the earth. In a season of drought, rolling has saved the crop, when without it the seed would have never sprung from the ground. In wet and heavy ground it is believed the roller, smoothing and hardening the surface, will leave the soil immediately beneath the surface in a better condition to generate the seed. On grass ground that has been heaved by the frost, the roller has an excellent effect in fixing the roots. Rolling the ground is also good when the land has been laid down unevenly the previous year. If the land is too dry, wait till just after a soaking rain, and it will work capitally. It is a good idea to roll ploughed sowed ground before harrowing, as it presses down the furrows that would be turned back and makes the surface less uneven, and the harrow pulverizes it much. We find that on an average not one farmer in four has a roller."

ROTATION OF FIELD CROPS IN OHIO.—I would like to give to the readers of the *Rural New-Yorker* my system of rotation of field crops, which works satisfactory for this part of Ohio. I have my farm divided into seven fields; one of them I keep in mixed grass for permanent pasture; the remaining six are farmed in clover, corn, oats and wheat. Every spring I break a clover field and seed a new one, I raise two crops of corn in succession, then turn the corn stubble under for oats; then two crops of wheat, then clover again. I cut one of hay, and the aftermath is left on the land. All the manure that is made during the winter is hauled from the stables fresh and thrown in heaps on this clover field, and is spread in the spring just before ploughing; and all the manure made through the summer is piled up in the barn-yard, and spread on the wheat in the fall, before seeding, as a top-dressing. My crops flourish under this kind of treatment.—*Cor Rural New-Yorker*.

FINGER-AND-TOE IN TURNIPS.—Finger-and-toe or anbury in turnips depends upon faulty nutrition, depending in its turn usually upon some deficiency in the soil of the materials essential to plant growth. Absence of lime is one of the most notable causes. The distorted, warty, useless anbury roots commonly appear on sandy, peaty, poor clay soils. Frequently we observe them where the top soil has been removed, as in the digging of stones, or in carelessly levelling down highly ridged up land. A portion of a field much carted on or run together will often furnish a large proportion of such diseased plants. Frequently recurring turnips abstracting certain elements from the soil aggravate the mischief. Grubs and worms sometimes supposed to cause anbury, are in reality an effect, not the cause of the disease. The fitting treatment obviously is a dose of that particular material of plant food in which your soil is deficient. If this happens to be lime, the gas lime, as you propose, containing lime, hydroxide, carbonate, sulphate and sulphide will be an appropriate remedy. Ordinary lime chalk, or any other conveniently accessible carbonaceous matters may be substituted. Six or eight tons per acre is a full dressing. As such fertilizers are apt to be washed tolerably rapidly through a porous soil, they are best applied on the surface, spread and mixed by the harrows a week or ten days before the land is ridged up for roots, or before the seed is drilled on the flat. If caustic lime is applied it should not be put on at the same time that guano or other ammoniacal manures, or even good farm-yard dung, is used, since it liberates and may waste the valuable ammonia. Lime, whether caustic or gas, doubtless owes much of its value for the cure of anbury, and other useful purposes, not only to its furnishing lime, but also to its increasing the solubility of phosphates and potash.—*N. B. Agriculturist*.

Grasses and Forage Plants.

The Superior Merits of Alsike Clover.

We are inclined to think that, comparatively speaking, very few farmers are acquainted with this excellent variety of clover, so as to understand and appreciate its high merits as a forage plant. Some have given it a single trial, under disadvantageous circumstances perhaps, and have conceived a prejudice against it. We subjoin a few of the many testimonies in its favor that might easily be culled, and be-peak for it at least a fair trial. In addition to the advantages enumerated in the quotations, it may be stated as a recommendation not to be overlooked, that Alsike clover is better for honey production than white clover even, while bees are unable to extract it from red. No farm is complete without bees, and they will gather more and better honey from this than from any other plant.

The following are mentioned by the *Farmer's Indicator*, as reasons why the Alsike is superior to our common red clover.

1st. Being a finer seed, and from three to four pounds being sufficient to seed an acre; while six to ten pounds being required of any other variety.

2d. For hay or pasture it fully doubles the value of the medium clover, being a finer fibre and seemingly having a much sweeter juice.

3d. Having a fibrous rather than a tap root, it does not heave so badly by frost, and will continue its growth for three or four years in succession, each year producing a large yield of hay and seed.

In answer to an enquiry as regards the value of Alsike clover, the *Ohio Farmer* says:

"This clover makes good hay so far as we have heard from the farmers who have raised it. It bears a greater resemblance to white than to red clover, except in height of growth. A farmer who has given it a fair trial says, that all stock like it. It is free from dust, and will stand more hard usage from the weather, after being cut, than any other grass with which he is acquainted. It matures at the same time as timothy, making it a good grass to sow with it."

We copy the following from "How to Make the Farm Pay," by G. Deitz of Chambersburg, Penn.:

"From a very limited trial we have made with this clover, we are satisfied it is better than our white clover as a pasture grass; unlike the red clover, it is perennial.

"We believe, upon a fair trial, Alsike clover will recommend itself favorably to the farmer, and will be preferred to the red, wherever it can be advantageously grown. This year it has been cut six feet four inches in length, and the average length on one acre was four feet. Our stock prefer it to all other clovers, and the afterwards does not salivate our horses or cattle. It should be sown with timothy or stiff grasses, to hold its fine growth up. It will stay green until after harvest, when it will be as green as the timothy, and not turn black as our red clover, when cut as late as timothy is, after being left standing until after harvest. It can also be threshed with timothy, and the seed easily separated, and it also acts as a flavor to threshed timothy, and all can be fed without waste.

"Alsike luxuriates in damp soils, and will not freeze out as the red clover, and can also be used well as a fertilizer, as it yields a heavy succulent matter to plough under. It also has three times the roots that red clover has.

"Alsike can be sown in the spring on wheat or oats, in the fall with timothy at seeding time. Three quarts of Alsike and three quarts of timothy make a very good seeding for an acre."

Mr. Elliot Grey, of Tecumseh, Mich., writes to the *Michigan Farmer*:

"The Alsike clover is the best forage crop ever raised. Last season he had taken off a full crop of hay, and this hay he had found was preferred by all his live stock; cows, sheep and horses would leave the best timothy or other feed to eat it when they could get at it. He had found also that where it had been sown, his sheep, cattle and colts left the best young clover, and would feed on the Alsike, which I think is the best."

"In the spring of '73," says a correspondent of the *Country Gentleman*, "I purchased, through an agent of our well known seedsmen, D. Landreth & Son, four pounds of seed. This I sowed with oats, on about five-eighths of an acre, in an orchard, one-half of which was rather poor and sandy, the rest a deep clay loam. After the oats were removed the clover furnished pasture for five hogs and about one hundred and fifty