

caustic or freshly-burned state; but also in a less degree by lime in other conditions. Whenever practicable, it is advisable to apply the lime as slaked lime. Burning and slaking reduce the lime to a fine state of division, so that, apart from the superior chemical effects of slaked lime, by using it in this condition we gain a further advantage, from its peculiar mechanical form, which admits of intimate admixture with the soil, and thus secures the fullest effect that lime is capable of imparting. In using lime in this condition, the lime is generally brought to the field in a caustic or hot state, and put up in small heaps, loosely covered with earth. In the course of two or three weeks the lime is completely slaked and falls to powder, which can now be easily spread over the land.

Quantity to be Applied.

The quantity of lime applied to the land in this manner will, of course, vary with the purpose it is intended to serve. If the lime is employed for a special object, as, for instance, to remove the excess of organic matter from old pastures when broken up, a copious dose of lime will be necessary; but when the soil has become deficient in lime, and an additional quantity is added, to act as a direct manure, a much smaller quantity suffices. Much difference of opinion exists amongst practical men as to the best system of liming the land. While some persons recommend a large dose at long intervals, other persons think it better to use a smaller quantity more frequently. Theoretically, we should think that, provided no reasons exist to the contrary, small doses at short periods would be the better system for obtaining the fullest effect of lime; since it is well known that everything applied to the land exhibits a tendency to sink in the ground, and bury itself beyond the reach of the plants.

Not a Substitute for other Manures.

In using lime as a manure, it must not be supposed that other manures can therefore be dispensed with. Lime is a special manure, and performs in the soil an office of its own sufficiently important to entitle it to a high place amongst manures; at the same time, it ought never to be used in place of farmyard manure. It is quite true that on certain fertile soils the addition of lime without any other manure is all that is necessary to insure abundant crops; and from this fact we might naturally infer, as many farmers have inferred, that lime is a substitute for other manures. But this is a grievous error. Lime, by its stimulating effect on the soil, will for a time replace manure, by exciting the soil to supply sufficient material for the growth of several successive crops; but this supply is affected at the expense of the strength of the soil; it is drawing upon its capital, and must sooner or later feel the effects of this undue exhaustion.

On the other hand, the opinion entertained by some farmers of the exhaustive effects of lime in all cases, and that therefore it ought not to be employed, is equally erroneous. The fact is, no ill effects are likely to follow the use of lime, provided other kinds of manure are supplied in proportion—it is from neglect of this fact that most of the failures experienced in the use of lime are to be attributed.

Caution in Application.

Lime ought never to be applied at the same time with other manures; it is advisable to put off the application of other manures as long as possible to land that has been recently limed. This precaution is the more necessary in the case of manures that contain combinations of ammonia; since lime liberates ammonia with the greatest ease from all its combinations. Hence the simultaneous application of lime and farmyard manure would probably be attended with a considerable loss of fertilizing material. No fear of loss need be entertained from this property of lime after it has been exposed in the soil for two or three months, as by this time all the caustic lime will have become carbonate of lime, and have lost its more active properties.

Fall or Spring Wheat.

There are parts of North America, principally confined to the great corn-growing belt, where the culture of winter wheat in consequence of the loss from freezing and other casualties has been discontinued. In these districts the principal dependence is necessarily upon the spring varieties, and where care is taken in the selection of seed, and in the preparation for the crop with early seeding a quality of spring wheat is produced that will yield flour of very high grade, and that is actually richer in the essentials of bread food than winter wheat. But whenever winter varieties can be grown to advantage they are found to be more satisfactory, owing to their better yield, earlier ripening, and superior average quality. While the superior merit in regard to quality is possessed by winter wheat, it is useless to advocate its culture in places for which from climate or other causes it is unsuited.—*Western Rural.*

Deep Ploughing.

It has been truly said that an increase of one inch in the average depth of ploughing throughout the United States, would produce a larger amount of profit, as compared with present results, than all the gold received from California. We believe in this assertion, says the *Working Farmer*; but we do not believe that all soils without being previously subsoiled are fit for this immediate increase in depth. We know that even clay subsols, which approach within a few inches of the surface after being thoroughly subsoiled, are so ameliorated as to be capable of admixture with the immediate surface-soil: and we are equally well aware that subsoiling cannot be performed with any profit in clay subsols containing excessive amounts of water; that such soils must be first underdrained and the subsoiling precede an increase of depth in surface ploughing. But there are millions of acres capable of being ploughed to double the depth to which they have ever received an incision from a tool of any kind, with increased profit. Even in the State of New York there are thousands of acres at this time, which have never been ploughed to a greater depth than four inches, composed of a loam entirely ready to be disintegrated by a surface ploughing to a depth of twelve or fifteen inches with increased profit and there are few soils that may not be at once ploughed to a depth of an inch or more than its former depth. The adage "that many farmers own another farm immediately under that which they now cultivate," can not be too often repeated, and the judicious farmer, whose will has been so often quoted, as having informed his sons that he had burned a sum of money at a depth of twelve inches somewhere on his farm, and that they must find it, improved the quality of their products by the disturbance of the soil more than he would benefit them by the supposed legacy by direct bequeathment. Less manure will produce a larger amount of crops in a deeply disintegrated soil, and it is not true that the deeper you plough the more manure you require. It is true that the more thoroughly manure is divided, the greater will be the amount of the crops produced, and this is the more certainly brought about by deep than it is by shallow ploughing.

No practical farmer can doubt that in deeply ploughed soils, crops are less annoyed by drouth and by insects; and if ploughing is useful at all, it must be useful precisely in the same ratio to the amount of soil disturbed, provided that the roots are capable of appropriating a greater amount of soil by its disturbance. Who doubts that roots will travel to the depth of twelve or fifteen inches, or even double that distance? Who doubts that the line passing down through the soil, will rest on the surface of a cold and undisintegrated subsoil? Who does not know that many farms supposed to be worn out have been revived by the increase of a few inches in the depth of ploughing? Who will longer be contented to use a pitiful one-horse plough, skating it through the soil like a harrow with one tooth, when by deep ploughing he can more than double his crops?

Spring Wheat.

The prospect of good prices for wheat has seldom been better than for the coming crop of 1873. Farmers who have fields in fit condition for a crop of spring wheat cannot probably do better than by devoting them to that purpose this season. But the land must be suitable and in high condition if a profitable return is to be secured. We entirely agree with the *West in Rural* in saying that unless land is in good cultivation and comparatively free from weeds, wheat (whether fall or spring) ought not to be sowed. Heavy barn-yard manuring is injurious, causing an over growth of straw, which, especially in moist seasons, is liable to rust, lodge, etc.; yet the application of well-rotted manure will be beneficial if plowed under in the fall, so that the crop may be sown as early in the spring as the frost leaves the ground, and it is in condition to work. The seed too must be put on uniformly, and the surface soil well pulverized and rolled. There are many varieties of spring wheat; some of which fail in one locality, but are found to give the best results in another; therefore, if a particular variety is by experiment found to be adapted to the soil and situation, it should be retained until by other cautious experiments the new variety is found to be successful. Every farmer should try to raise enough wheat for his own use at least, but it would be unwise to rush into wheat raising too extensively, because the crop happens at present to be higher than many of the other staples. The true maxims of the farmer should be diversified culture, rotation of crops, and better cultivation of the land; more grass, and more rest for the soil; more and better stock, and, which follows, more manure.

Fife Wheat for Winter Planting.

A farmer residing in Wisconsin recently published an account of his success in raising Fife wheat as a winter crop from seed imported from Scotland. He stated that he had tested it for three years and been completely successful. His crop in 1872 yielding 45 bushels to the acre. The same experiment has been tried in Canada with very different results. The writer tried an acre of it in 1851 after a crop of early potatoes. It stood a winter quite as well as the Fall wheat on the same field; it was a nice even crop, and yielded about 28 bushels to the acre. This was so satisfactory that the following season we sowed an acre with the seed we had raised. It came up well and looked as well in the fall as the winter wheat beside it; but speaking of it to a friend, he warned us that though Fife wheat did well enough the first year for fall planting it would not bear repeating. He said he had known several attempts made, but in every case the plant was winter-killed, and this proved to be the case with our test acre. It was completely killed, while the fall wheat alongside of it was the best crop we ever raised.

Rotation of Crops.

An old French agriculturist gave the following seven rules as the fundamental principles of rotation:

1. However well a soil may be prepared, it cannot long nourish crops of the same kind in succession without becoming exhausted.
2. Every crop impoverishes a soil more or less, according as more or less is restored to the soil by the plant cultivated.
3. Perpendicular rooting plants and such as root horizontally ought to succeed each other.
4. Plants of the same kind should not return too frequently in rotation.
5. Two plants favorable to the growth of weeds ought not to succeed each other.
6. Such plants as eminently exhaust the soil, as the grains and oil plants, should only be sown when the land is in good heart.
7. In proportion as a soil is found to exhaust itself by successive crops, plants which are least exhausting ought to be cultivated.

PREPARING LAND FOR GRASS.—We are apt, very apt, to overlook the fact that land intended for grass should receive more thorough culture than any other, because for years while in grass, it has not the advantages of the plow and other implements to stir the soil, but must rest and pack and get more and more in a condition to keep out the air, and let in and pass off less readily the water. We should, therefore, thoroughly prepare the soil. Plow as deep as may be, and subsoil well; pulverize and enrich the land—enriching it will make it more mellow, and keep it longer in that condition, as well as increase the yield. Such land will "catch" its seed, and if plentifully applied, will be certain under anything like favorable circumstances to form a thick set. A little top-dressing, made by the aftermath, which should never be fed close, will insure good crops—two cuttings a year. But let there be a cold, hard under soil, and the seed put in the usual way—little of it and on hard and reduced soil, without manure—what can be expected of it? Just what we see; light crops, getting lighter each year till it will hardly pay for harvesting. Such land, when the plow turns it down, will be found to be hard. The sod amounts to but little, whereas, in properly treated land it will yield from 60 to 70 loads of manure per acre. A mellow seed-bed, deeply loosened soil well enriched, plenty of seed sown and sown as early as possible—are the points to be secured in putting down grass lands.—*Rural World.*

HARROWING WHEAT IN SPRING.—In reply to a correspondent who asks whether it is advantageous to harrow wheat in spring. The editor of the *Country Gentleman* replies that he has successfully harrowed wheat in spring, repeating the operation two or three times at intervals of about a week, until the wheat was a foot high or more. The result was quite successful, and the crop was increased over five bushels per acre. The implement used was the smoothing harrow, which pulverizes the earth, without injuring the plants. At the last harrowing, clover seed was sown, and it took better than another sowing early in spring in the usual way without harrowing. This mode of harrowing may be applied to wheat sown broad-cast or drilled equally well, and it makes little difference whether the harrow is run with or across the drills.—*Country Gentleman.*