

farmers are surprised at the large crops they can raise on a clover sod? You see also why lands in rotation with clover can endure the heavy tax of two crops of wheat in succession without complete exhaustion. But when a body of clover is ploughed in with the sod, we reach results that round out that figure of Oriental magnificence, "The pastures are clothed with flocks, the valleys also are covered over with corn; they shout for joy, they also sing."—*Prof. W. J. Beal, in Farmers' Friend.*

#### SPREADING MANURE AS DRAWN.

A *Country Gentleman* correspondent writes:—I will state why I think manure washes away on frozen ground, when a thaw comes, much less if spread than if left in heaps. My conclusion is made from many years' practice. When the rain comes pouring down on one of the "five or six hundred pound heaps," it washes out large portions of the soluble manure, more than the soil can absorb. But when already spread evenly over the ground, the small amount of soluble manure which comes from this thin layer is at once absorbed by the broad soil below. Twenty good two-horse loads of manure, when evenly spread, make a stratum not the fourth of an inch thick, and when there is a thaw and rain sufficient to wash out the liquid from this stratum, the surface of the ground has thawed to an equal depth at least ready to take in and secure it. The manure and the soil will both thaw together. It is only in swales or hollows that enough rain can accumulate to wash away manure. Take an umbrella and go out in the midst of a heavy shower, and examine the surface of the ground, and you will see no washing floods on level or upland surface. By the time that it has rained long enough to form brooks, the soil is thawed deep enough to hold the liquid manure. I have tried this over and over, but I always apply the manure, which is done in fall or winter, on grass, to be turned over for corn in spring, and suppose there is less chance to wash on a grass surface. I have placed manure on a steep hill-side, and could never find by the increased growth of the grass that the wash went five feet away from the manure.

I do not object to ploughing under manure in spring, provided it has lain broadcast on the ground all the previous winter. I found it to be a serious loss to leave it unspread in heaps till spring. Several different farmers have reached the same conclusion—namely, that manure is twice as efficacious if applied broadcast in autumn as when merely drawn and ploughed under in spring. There is one point liable to be misunderstood. To leave winter-made manure in heaps all summer, and then spread it in autumn, occasions a whole summer's loss, and this loss should not be charged to surface manuring. It would of course be better to use it at once and plough it under. Spread it in winter as fast as made, and do not leave it unspread a whole season.

#### EXPERIMENTS IN POTATO PLANTING.

The following experiments, says the *Massachusetts Ploughman*, were tried the past season. The first was to ascertain which end of the potato would secure the best results. A piece was first cut off the seed end of the potato, then a piece, as nearly as possible, of the same size cut from the opposite end. All but two eyes were cut from each piece. Two pieces were dropped in each hill. That there might be no possible chance for a difference in the soil or culture, the pieces cut from the seed end were planted in alternate hills, with those cut from the other end. The result at harvesting was as follows:—Whole amount

twenty-one pounds, of which thirteen and a half pounds were large and six and a half were small potatoes. Whole amount from seed cut from the seed end, twenty-seven pounds, of which twenty-one and a half pounds were large and six and a half were small potatoes. The tops of the potatoes that came from the seed end looked the best throughout the season, and were earlier than the others, but the potatoes were not as smooth, the worms having eaten them more, and quite a number of good-sized potatoes were rotten, which were not included in the above weight. Had it not been for the worms and the rot, the weight would probably have exceeded thirty pounds. The reason why the potatoes from the seed cut from the large end did not receive any injury from the rot or the worms, was undoubtedly because they were later.

The second experiment was to ascertain which is best for seed, small whole potatoes, or large cut. The small potatoes selected were about one inch in diameter, and the large ones would weigh about three-fourths of a pound each. The pieces were cut to a size, to correspond in weight to the small whole potatoes, and only two eyes in each piece, or whole potato, were left to grow, the others being cut out. The whole potatoes were planted in alternate hills with the cut. The result at harvesting was as follows.—Whole amount from large cut potatoes, thirty-five pounds, of which twenty-six and a quarter pounds were large, and eight and three-quarters small potatoes. Whole amount from small whole potatoes, forty pounds, of which twenty-seven pounds were large, and thirteen small potatoes.

The tops of the potatoes from the small whole potatoes looked the best during the entire season, but the potatoes, like those that grew from the seed end, were eaten by the worms. Quite a number of large-sized potatoes were so badly eaten that they were put in with the small ones. Several pounds of large potatoes were also rotten and not weighed. These losses account for the large proportion of small potatoes, and the reason of the loss may be attributed to the fact that they were a week in advance of the others when the roots formed.

The first experiment given above was tried in 1860, with nearly the same result as to the amount, but the quality of the potatoes, from the seed end, was equal to the others; in fact better, if size is to be considered. The same experiments will be continued, and the product from the small whole potatoes this year will be kept to furnish the small whole potatoes for seed next year, and so with the large cut, seed end, etc.

#### HARVESTING TIMOTHY HAY.

The hay harvest is approaching, and it is well to consider the advantages and disadvantages of cutting timothy early or late. If cut early—that is, at what is known as the "second bloom"—the hay looks brighter, smells sweeter, and stock will eat more of it. Furthermore, the Agricultural Department has advised the early harvesting of meadows, because the hay contains most of the albuminoids and other valuable food elements. Moreover, when the markets are bare, as at present, hay when cut early can often be sold in the field more profitably than at any time thereafter. These reasons have prompted the early cutting of timothy in this neighbourhood, but the result has not been as profitable as hoped for, since it has been learned that if timothy meadows are cut before the plant has attained a certain stage of growth, exposure to the sun will kill a portion certainly, if not all, of the roots. The three summer droughts in succession in Central Illinois have perhaps required the re-seeding of nearly half the meadow acreage, and it is only lately that it has been

ascertained that the timothy bulb matures at nearly the same time with the seed. If the grass is cut early the bulb is left without support in its immature state, and where it is suddenly exposed to the sun and heat it dies. If the meadow is left to stand till the bulbs mature, the plant retains its vigour. This appears to be the explanation why one part of a meadow harvested late in June, or early in July, will show very serious injury, while on the other part, where the harvest was a few weeks later, the stand is good. Cattle feeders of fifty years' experience tell me that stock may eat more early cut timothy, but a less quantity of late harvested does more good.—*Illinois Correspondence, in Country Gentleman.*

#### EXTRA CULTURE.

On extra culture of soil, Professor Roberts, of Cornell University, says: "Herein I am satisfied lies the secret of England's success in raising large crops. It would take away the breath of a prairie farmer to hear even an Englishman's enumerations of the 'spuddings,' the 'grubbings,' the 'twitchings,' the harrowings, the cross-harrowings, the rollings, the crushings that a heavy clay field is subjected to before it is considered ready for wheat. What is all that for? Simply to unlock the full storehouse of nature. That it is full has been proved time and again. By actual analysis it is found that an average soil contains in the first six inches plant food enough for from fifty to one hundred and fifty full crops of grain. I do not desire to discourage the purchase and use of fertilizers, but what I do protest against is purchasing on time commercial manures at \$40 per ton to enrich cloddy fields already fairly rich in plant food; locked up, it is true, but there none the less, only awaiting a little judicious application of brain and muscle to set it free. If these hastily jotted facts and impressions are the means of inducing my fellow-farmers to remove some of the useless trees and fences, or to give the fields an additional cross harrowing or two before carting in the seed, and asking the Lord to bless the labour of their hands, my object will have been attained."

#### HUNGARIAN HAY.

The *American Cultivator*, replying to a correspondent, says of this hay: "For a number of years we have fed Hungarian hay without any injurious results. We are now feeding it to an aged, run-down horse with the very best results; in fact he prefers it to the best English hay, and notwithstanding he is being worked quite hard, he is rapidly gaining flesh. Cut up and mixed with meal we have found Hungarian an excellent flesh producer for our horses, and a food upon which they could do a large amount of work. We generally raise it as a second crop after winter or spring rye, oats, or early-sown fodder corn, thus enabling us to obtain two heavy crops in one season. If you are not in possession of a good supply of barnyard manure to apply when ready to put in your Hungarian seed, do not fail of obtaining a supply of some special fertilizer, for it is a heavy feeder, yielding a heavy crop, and will prove a very nutritious fodder."

#### DRAINAGE IN OLD TIMES.

Under-drains were used by the Romans and constructed of wood. Even brush drains have been made in various parts of England. Thorough drainage came into practice about the middle of the present century, through the exertions of Mr. Smith, of Deanston, and for a long time stone was the principal material used in their construction. They are either thrown in promiscuously or laid out in throats or channels. When tiles or pipes came into use stones were laid around them, but it is found that less soil percolates into the tile when the earth is close around it.