

stated before, the air can sooner dry out the soil.

On the whole, therefore, the question of a deep seed bed and of fine pulverization is greatly important. It is so important that it should never be slighted. It would be better not to sow a crop on ground unprepared, that is, not properly prepared, than to sow and run the hazard of getting little or no return if adverse weather should follow.

The Farmer's Vegetable Garden.

It is simply surprising to notice how little attention is given to the average farm garden, when we think of its value. There is no spot upon the farm, of equal size, which will compare with it, either in money value, in the influence which it exercises upon the health of the family, or in the practical knowledge which it furnishes to those who till it. The vegetable garden and the fruit garden are frequently considered together, but that is not our purpose at the present time. We wish to discuss only the vegetable garden. While both are very valuable, the vegetable garden is the more valuable of the two, and, if either one is to be done without, it should not be the latter.

A small piece of ground will suffice for a vegetable garden. Its size should bear a close relation to the size of the family, but usually it need not be larger than one-fourth of an acre. When managed on the intensive plan—that is, on the plan which is calculated to give maximum returns, without so much regard to the labor expended—the garden would answer very well if it were smaller, even half the size named, except for a family which was very large.

It should be plowed in the fall, and deeply plowed, to suit Ontario conditions. A less depth would suffice on prairie soils. But in Ontario, and also in the Northwest, if the ground could be plowed and subsoiled at the same time, it would be a decided advantage. On stiff soils it would be better to leave the land ridged, to present a large surface to the action of the weathering influences. In the spring it should be levelled with the harrow, or, at least, that portion of it which is to be first planted.

Many vegetables should go in early, such as lettuce, onions, carrots, parsnips, and radishes. Of onions there should be several varieties, and also of carrots and radishes, and the same is true of many of the other sorts yet to be named. The various kinds of each should be chosen with reference to their edible qualities, earliness or lateness, and adaptability to soils. After the kinds named, beets, peas, corn, potatoes, and beans follow; and, still later, cucumbers, melons, and squashes. Such relishes as parsley, summer savory, and spinach should not be overlooked. In fact, the aim should be to have the variety as comprehensive as possible, and yet not to have a large quantity of any one kind except of those which are regarded as stand-bys, as, for instance, carrots, beets, and turnips. Cabbages, tomato, and celery should all have a place. And asparagus should be given a row in some part of the garden—as, for instance, along one side—where it will not impede cultivation.

By observing due care some of the earlier crops can be grown to be out of the way of kinds that come later, inasmuch that two crops in one season can be grown on the same ground. For instance, late cabbages could come after radishes, and late corn or turnips after lettuce. When two crops are grown thus instead of

one early crop, the soil is more likely to be kept free from weeds by the cultivation given to it in growing each crop.

The great mistake made in the garden, usually, is deferring the hoeing season too long after the seeds have been put into the soil. The hand-hoeing may profitably begin before the seeds have been sown many days. It may be stirred lightly along right over the line of the row where the seeds are planted. In this way the weeds which are starting over the line of the row will be destroyed. This work must be done with much care. Then, as soon as the seeds are up, horse-hoeing may begin, for in the farmer's garden the seeds should be planted in rows rather than in beds. They should be planted invariably with an eye to the use of the horse hoe.

Much may be done by way of enriching the garden by a judicious use of the slops of the house. Suds of all kinds are excellent for the garden, and, if carefully used in a dry time, they may be made to serve an excellent use apart from the fertility which they convey. Then, oftentimes, wood ashes may be conveniently applied, which would otherwise be thrown away.

When a young family is growing up, the influence of a garden in developing a love of labor, and more especially in the direction of the tillage of the soil, is very great. Children usually love to witness growth, and more especially when they have a personal interest in it. Let each child have a share in the ownership, and the effect will be greatly encouraging. While engaged in caring for the garden, the young folks are gaining useful knowledge, they are doing what is in itself a good work, and their love of home and of farm life is intensified.

Planting Potatoes.

No question probably has been more discussed than that of planting potatoes. Opinions differ widely in regard to it, owing, it may be, to a difference in soils and climatic conditions. Opinions ought to differ, for it would not be found possible to lay down rules that would be applicable to different countries, or that would even be applicable to all parts of the same country. But in potato planting, as in other things, there are some leading principles which are generally applicable, and it will be the aim in this paper to refer to some of these.

First, as to seed, good well-developed potatoes are to be preferred. Those are to be rejected which are unshapely, crooked, distorted and small. It will be found that though small seed may be chosen and may sometimes produce a good crop, ultimately the crop would deteriorate if small seed were chosen from year to year. The good crop is not the result of the small seed, but a result obtained in spite of the fact that small seed had been planted.

The question is still undecided as to whether medium-sized seed should be chosen and planted, or as to whether pretty large sets should be chosen, and cut into three or more pieces. Both systems have given good returns. In Ontario the best returns have resulted from planting whole medium-sized potatoes in the trials made at the Guelph Experiment station, but, taking the continent over, the balance of testimony favors the cutting of large potatoes into pieces having from one to three eyes each. A number of experimenters seem to think that when whole potatoes are used there are more small ones, the result of a growth of too many tubers from the one

potato. The same result in a more aggravated form comes from planting large potatoes without first cutting them. Those who have tried the plan of cutting off the seed end of the potato and rejecting it for planting do not seem to be quite satisfied with the results. It did not seem to help the yield. It is true, probably, that there is more vitality in the seed end of the tuber. If blind eyes are found it is almost invariably at the rear end of the potato, that is, at its base. In some instances, where the seeds of the top ends of the tubers have been saved and planted by themselves, it has been thought that the early maturing of the crop has been advanced.

Some successful potato planters prefer cutting the potatoes three to five days before planting them, and then strewing them over the surface of the ground to the depth of a few inches, where they are exposed to the sunlight. The cuts heal quickly when the sets are thus exposed, and the sunshine tends to cause the potatoes to sprout quickly. Where they cannot be thus spread in the sunshine, they may be strewn over with plaster of Paris. The difference in the coming up of potatoes thus treated as compared with those not so treated is very considerable. In some instances it amounts to several days.

A vast majority of growers plant potatoes in drills rather than hills. This is not owing to the fact that hills yield less than drills, but rather to the fact that it is more trouble to plant and care for them when thus put into the ground.

The opinion is now pretty general that potatoes should be planted deeply. The drills are usually opened with some kind of plow to the depth of five to seven inches. These drills are twenty-four to thirty inches apart, and in some instances as wide as thirty-six inches with large and free-growing varieties. This is owing to the fact that in the east, where there is sometimes an excess of moisture, the tops shade the ground too much when the potatoes are closely planted, and in consequence the potatoes are more apt to rot. In the far west this excess of moisture need not be feared to anything like the same extent. The sets in the drills are planted from eight to fifteen or eighteen inches apart. In the trial contests for prizes offered by the *American Agriculturist*, those planted not too far distant gave the best returns.

Covering may be done in various ways. There is no doubt but that the most satisfactory way would be to cover with the hoe, but it is too slow where a large crop is to be grown. Some form of plow may be used in covering, but it should not cover more than three inches at the first. A deeper covering will be furnished when the harrow is run over the ground some days later. Many persons who grow potatoes lose considerably by not planting them more deeply. When planted deep they are out of the way of injury from the harrow, the tubers grow in a damp place, and they do not push their way up to the surface of the ground when they are growing.

Tile Draining.

The general verdict of those who have had experience in farm operations is that no money is so sure of giving a return as that expended in tile draining. On any land that is in good heart, and at all wet, the additional receipts from the first crop will often pay the whole bill, while almost invariably that from two crops will repay the whole expenditure.

Plants derive their sustenance through the moisture taken up by their roots; for it is

moisture that lets loose, absorbs, and thus prepares the elements for plant food, and it is through moisture alone that the elements containing plant food become soluble, and, therefore, through this process plants obtain their nourishment. Now, excessive wet not only wastes these elements after they have become soluble, but through this means the plant food is so diluted that the plants perish for want of sufficient nourishment—although they may escape drowning—for plants require air, water, and food, just as animals do.

Perhaps there is no crop that shows the absolute necessity for underdraining as much as does fall wheat. Walk over a field in April, which is generally the hardest month on this plant. When the wet hollows have been properly drained, and the apparently dry knolls left undrained, the plant will tell to the very inch how far the drains are doing their duty. As far as the soil is dry the plant will be healthy, however cold and unfavorable the weather may be, showing that it is still deriving the proper sustenance from mother earth. On the other hand, when the drainage is imperfect, the cold nights and drying winds by day, slowly, but surely, starve the plants out of existence, thus showing that it is not excessive wet alone that necessitates tile drainage, for the advantages are quite as apparent during a drouth. When land is imperfectly drained the cracks open. These wide fissures admit the hot wind and dry the ground still more excessively, but when the land is thoroughly drained a different action takes place. The soil becomes interlaced with tiny channels, that not only assist drainage when required, but, as the weather becomes dry, act as capillaries in allowing the moisture to escape upward to the surface for the benefit of the crop, while these again admit the outer air, laden as it is with moisture which it gives off in the cooler temperature of the earth, just as the drops congregate on the cold surface of the water pitcher.

In entering on the practical part of tile draining, the character and varieties of soil are the chief factors which govern the laying out of the work. For instance, a nearly level surface does not require as large tile in the main drains as does a surface that is more undulating or hilly, for, in the level surface, it takes considerable time for the water from the laterals to reach the main drains. On the other hand, when the surface is undulating, after a heavy rain, the water rushes forward with a greater velocity, taxing the capacity of the drains for the time being, and endangering the growing crops.

Again, a strong, heavy clay will not retain much moisture, especially in the subsoil, and, therefore, the water must nearly all run off; while, on the other hand, a deep loam, when thoroughly dry, will absorb a large amount before the drains begin to run, and for the same reason they will run for a much longer time in such soils after a shower than in clay.

When at all practicable, a map of the drains in each field should be made and kept for future use. These will amply repay the trouble of making, as any one knows who has had the experience of searching for a drain that has become choked. It is easy to measure from some landmark, or the field fences may be made the basis from which the measurements may be taken.

In level fields, or those with a uniform surface, this work is comparatively easy; but when drains are made to follow the depressions in the field, as in the case of draining the hollows or wet bottoms, and therefore are not run straight, the work is a little more