

or suckers, which are sometimes found in considerable amount spreading out from the hills, a little under the surface of the ground. These runners are highly endowed with the vital principle, are more certain of growing, perhaps, than cuttings, and like them remain true to the parent stock. Both cuttings and runners, therefore, may be indifferently employed for raising a new plantation. It is of importance, however, that they should be taken from young and vigorous plants, of a pure and distinct variety; otherwise, the young plantation to be raised will present a mixture of different sorts, varying as to forms of growth and time of ripening; conditions always inconvenient, and more or less detrimental.

It must be remembered that the hop is a diocious plant, that is, there productive organs of the male and female are the products of distinct plants. The flowers of which are of different forms and habitudes. The male hop produces no flowers that possess any commercial value; what are commonly known as "hops," are exclusively the flowers of the female plant. One is as necessary to the other in producing perfect seed as are the sexes in animals. The male hop has its flower, or pollen, previously perfected, so as to impregnate the stigma or "bur" of the female as soon as it is ready; which inoculation gives that energy and vitality to the seed, without which it would not produce in a perfect manner its kind. It is this pollen which gives weight to the hop, and also the fine aromatic bitter, which, while it imparts so agreeable a flavour and healthy tonic qualities to beer, exerts an indispensable influence in regulating its formation and preserving its quality. The petal, or leaf of the hop, contains but little of the astringent principle required, compared with what is found in the seed. The same atmosphere which ripens and wafts the pollen from the male, prepares the female for its reception. Two or three male hills will be found sufficient for an acre; they should be equally distributed, with poles a little higher than the rest, that the pollen may be the more readily diffused.

The raising of hops from seed is both tedious and uncertain: three or four years must elapse before they can be brought into bearing, and there can be no certainty, beforehand, whether the same seed will produce the same variety: the probability being that several different kinds, most, if not all of them, inferior to the parent, will be the result. For experimental purposes only can the raising of hops from seed be recommended, and innumerable failures will in all probability be endured, ere a single new variety, worth cultivating, is produced.

Familiar Talks on Agricultural Principles.

THE POTATO.

Among the excellent roots raised on the farm, this is by far the most important and valuable, and until within a few years past, no crop grown by the farmer or gardener was more easily raised, or brought a more sure return. Of late, however, much mystery and uncertainty have come to be connected with the culture of this plant, in consequence of the wide-spread prevalence of a disease known as the rot or blight. Before the appearance of this affection, there seemed no call for any particular skill in cultivating the potato. It would grow in any hole in the ground, or indeed on the top of the ground with a little straw or litter over it, and yield good crops. Now, the science of the agricultural chemist, and the toil of the experienced practical farmer and gardener are alike at fault, and the potato has become one of the most fickle of the plants on which the cultivator's art is expended. In discussing its culture, other principles besides those connected with the composition of the plant, and the adaptation of particular soils to it, must be taken into consideration. But, following the order of things adopted in previous "Talks" with regard to other cultivated plants, we may first advert to these general principles, and then touch

upon those which are peculiar, and attention to which seems to be necessitated by the diseased conditions under which the potato has been struggling for some time past.

The composition of the ash of the potato is thus given by Johnston:

Ashes in 10,000 lbs. of the roots and stems.		
	Roots	Tops
Potash	40-23	81 9
Soda	23-34	0-9
Lime	3-31	129-7
Magnesia	3-24	17-0
Alumina	0-30	0-4
Oxide of Iron	0-23	0-2
Silica	0-84	49-4
Sulphuric Acid	5-40	4-2
Phosphoric Acid	4-01	19-7
Chlorine	1-60	6-0
	82-83	303-4

This table plainly indicates the character of the soil in which, under ordinary circumstances, the potato will flourish the best. It is one in which lime and potash are found in considerable quantity. Every farmer is well aware that the best crops of this plant are usually obtained from new land. This is because the virgin soil is rich in stores of alkaline and other mineral substances furnished by the ashes of the recently-cleared forest. Would we put old or exhausted land into the best state for this crop, we must supply such substances as lime, wood ashes, plaster, salt and bone dust. Thus we provide a store of material such as is enumerated in the foregoing table, and assimilate the soil to the condition in which it is found when first reclaimed from its natural state for purposes of agriculture. Strongly heating manures, such as that from the barnyard while still unfermented, are very unsuitable as applications to this crop. Thoroughly rotted composts are best for it, whether in the absence of the substances just enumerated, or in conjunction with them. The better the fertilizing matter is incorporated with the soil, the more likely are satisfactory results to be obtained. A loose, mellow, rich, warm loam, with a porous subsoil, is most fitted for this crop.

Little more need be said as to the general principles bearing on the cultivation of the potato, and we pass now to take a brief glance at the disease whose development has, within a few years, done so much to render abortive the attempt to grow this crop. On all questions relating to disease, it is proverbial that doctors differ, and the potato rot is no exception to this remark. All sorts of theories have been started to account for this affection, and as a consequence conflicting remedies have been suggested. Among all the theories with which we have met, none so thoroughly commends itself to our judgment as that which is ably set forth in Principal Dawson's little work on "Scientific Agriculture," to which we have repeatedly had occasion to allude in the course of these "Talks." Arguing on the wide and almost universal prevalence of the disease, and the many indications that the vital energies of the plant have to some extent failed, it is thought by the author just named, and by many scientific and practical agriculturists, that the peculiar mode by which the potato is propagated has much to do with the disease in question. It has been grown for many generations by natural or artificial division of the plant itself, and not as most plants are grown, by the constant sowing of fresh seed. Just as the longest-lived forest tree must at length die, so must the group or stool of the potato, which, originally founded by a single seed from a ball, is only one plant, increased in extent by a spontaneous division of its roots into detached tubers. It might have been expected that by degrees its energy would diminish, until at length it died out. If this be the correct view of the matter, it is not surprising that the potato now fails, but rather that it has held its own so long. If it be objected that the symptoms being those of disease, rather than of weakness and old age, they tend to disprove this theory, it may be replied that, after all, it has been a process of decay with which we have had to contend of late years in the culture of this plant, and that the manifestations have been very similar to those which

occur in the case of other vegetable products, when they attain an extreme age. If it be further objected that new seedling varieties have not escaped the rot, it must be borne in mind that they have been less affected by it than other kinds, and also that the parent plant whence the balls have been obtained may not have been wholly free from hereditary taint. The remedy, to be effectual, must be persevered in until several generations of the plant have been produced, and all hereditary taint has been worked out. Principal Dawson, contends that thoroughly to eradicate the disease, the Government of a State, or some public body or institution devoted to agricultural improvement, ought to take the matter up, and having at length produced a healthy family of tubers distribute them to such parties only as will agree to discontinue the culture of the present exhausted and diseased varieties. A public potato nursery of this kind might be maintained at comparatively small cost, and if it succeeded in restoring to us the potato in a condition of renewed youth, health, and vigour, the boon would be one of incalculable value.

In the meantime, whether the above theory be correct or not, there are certain palliatives, if not preventives of the disease, that every grower of the potato can resort to, and which experience has proved to be more or less effectual. These are early planting; frequent change of seed, especially from poor and cold localities to richer and warmer ones; the selection of such varieties as have shown the least tendency to be diseased; planting in dry and well-drained soils; the use of well-rotted manure, and fertilizers of a kind suited to the nature and wants of the plant, such as lime, wood ashes, salt, plaster, bone dust, super-phosphate, guano; and finally, planting, whenever practicable, in new land.

Although no thorough renovation of the plant has been effected so far as we have been aware by growing fresh tubers from balls produced by successive generations of potatoes, yet there are new seedling varieties which are much less liable to disease than the older kinds. Among these none are more worthy of attention than a number of new sorts originated by the late Rev. Chauncey Goodrich, of Utica, N.Y., who during the later years of his life experimented largely and patiently with the potato. How far the plant may be said to have become renewed under his hands we do not know, but several new varieties of great value obtained by him are now being extensively grown throughout the United States. Some of them have made their way into Canada, but they are not yet so well known as they deserve to be. Prejudice has been excited against them in some quarters, in consequence of the substitution of inferior old sorts for the new ones by unprincipled vendors. This has especially been the case with the Garnet Chili, one of Mr. Goodrich's first and best seedlings. The Kentucky Red, which somewhat resembles it, has been palmed off for it to a great extent; and being a large, coarse, watery potato, is of course thought but little of by parties who have been unfortunate enough to get it in place of the Garnet Chili. We have not at hand a complete list of the seedlings tested and found to be worthy of adoption by Mr. Goodrich, but from memory may mention, in addition to the Garnet Chili, the Early Goodrich, Gleason, Monitor, Harrison and Cuzco. Some of these varieties are, we believe, kept for sale by our leading seedsmen; but full information respecting all the varieties produced by Mr. Goodrich can be obtained by addressing D. S. Hefron, Utica, N. Y., who, since the death of the originator of the potatoes referred to, has had principal control of their culture and sale.

Manure-Saving.

To the Editor of THE CANADA FARMER:

SIR,—I noticed in your January number a communication from Bruce, requesting some information as to the best means of keeping manure. As I had a great deal of trouble and perplexity on this very subject, and lost considerable time and money before I could get my manure heap arranged to my satisfaction, permit me to offer the following remarks. When first I commenced farming, I was extremely desirous to stop this terrible leak out of the pocket caused by the wasting of manure, but then how to do it was a serious matter, for I did not sufficiently understand the subject to know what mostly to guard against. Covered manure heaps were the rage, so up goes a shed, and then sawdust, plaster, &c., placed behind my stock would retain the urine. But somehow my manure did not please me when taken out in the spring; part was awfully fire-fanged, part showed no signs of fermentation, and part in a