

angular, determined, the next step is to mark the places for the hills, an operation which cannot be performed with too much exactness. The rows of hops should be perfectly straight and regular in all directions, thereby rendering cultivation easier, and less subject to injury to the growing crop, and opening up the whole plantation in a uniform manner to the beneficent action of heat, light, and air." "Set out with chains (two land measuring chains will answer the purpose very well) nine or ten hills, as there may be length of chain, putting down sticks, which we will term station sticks, all over the ground at that distance, and then with a line marked with feathers, or coloured worsted, or something equally conspicuous, at the distance the hills are intended to be, and of a length equal to the distance of two stations, eighteen or twenty hills, as the case may be, proceed to set out the hills all over the ground, keeping the line (which should be well stretched before it is marked) sufficiently tight to reach exactly the length of the two stations, putting down a stick to every mark on the line, setting it out in rows of two stations' distance first, and then stretch the line across between the sticks in the rows, putting down a stick to every mark as before, which will finish as proceeded with. This method will set them out perfectly correct if care be taken with the chains, for as the chains will not err, neither can the line err, when made to reach the station sticks set out with the chains; small sticks, cut about 1½ feet long, are what is required."

The following table will show the number of hills on an acre of square plant, and triangular, at the same distances, and the difference:—

	Square.	Triangular.	Difference.
6 feet distance between the hills.	1210 hills.	1408 hills.	196 hills.
6 " 3 inches.....	1117 "	1296 "	179 "
6 " 6 ".....	1031 "	1194 "	163 "
6 " 9 ".....	957 "	1103 "	146 "
7 " 0 ".....	859 "	1025 "	136 "

It will be seen from the above, that the triangular form admits more hills per acre than the square at the same distance, in both cases, between the hills. Perhaps, in most instances, it would be better, when the triangular form is adopted, to put the hills further apart, so as not to exceed the number on the square. The advantages of the triangular form consist in admitting the ground to be cultivated in three directions, and in case of three poles being put triangularly to each hill, enabling the horse hoe to go as close to the hill as is compatible with safety, thereby stirring the whole of the ground; and also admitting light and air more freely to the plantation as a whole. The advantages, however, of this over the other form in a dry, bright climate like that of Canada, are not found in practice so great as to render it a matter of much importance in a considerable number of instances.

After the ground is correctly set out, each stick will represent the centre of a hill, and in good mellow soil well worked and prepared, nothing more is required than to plant perpendicularly a cutting in the place occupied by the stick, with three others around it in a sloping direction, with the upper ends inclining to the centre, pressing, with the hand or foot, the earth closely round the cuttings, covering their tops slightly with the soil, and replacing the stick to denote the site of the hill. In case the ground is poor and has been subjected to arable culture, it will be necessary to make square holes with a spade, about two feet deep and eighteen inches wide, taking each stick as the centre. These holes should have each a large shovelful of well rotted dung, thoroughly incorporated with the best surface mould, trodden down by the foot, and the planting proceeded with as before described. Hops should be planted as early in the spring as is practicable, that is, as soon as the ground is dry enough to work and its surface is getting warm. Everything should be in readiness as much as possible before the time of planting arrives, for a few days only of unnecessary delay may, in our short season, affect injuriously the growth of the cuttings, which should be put into the ground as fresh as possible. Late planting, followed by subsequent drought such as is not uncommon in our climate in spring, would jeopardize the whole undertaking.

It is a commendable practice to put to each hill a stick three or four feet long for the young vines to trail up, by thus allowing the plant from its earliest growth to follow its natural habits as a climber, its development becomes facilitated, though it is a common practice to allow the young vines to spread on the surface and afterwards twist them into a knot.

The greatest care should be taken to have the ground perfectly clear of weeds, especially when the hills are formed; for if couch grass or any other weeds of a similar character get possession of the hill it will be found exceedingly troublesome, it not wholly impracticable, to eradicate them without seriously injuring the roots of the hops. As hops from cuttings do not produce the first year, if the land be manured or naturally rich, Indian corn or root crops may be grown, but this should not be attempted when the soil is not of first quality, and in all cases care should be taken to give the young hops plenty of room, light and air. During the summer, the frequent stirring of the surface by either the horse or hand hoe should be proceeded with, not only to keep down weeds, but to promote the growth of the young plants. The occasional moving of the soil during our hot, dry summers, is exceedingly beneficial to all growing crops that admit of the operation; air and moisture are thereby more freely admitted, with the constituents of plant food to the spreading roots; but in case of hops, particularly, care must be taken that they are not unnecessarily disturbed or broken, during the later periods of growth.

With regard to preparation it may be further observed, that if cuttings be closely planted in beds in spring they will strike root and form nursery plants well matured by October, when they can be planted two or three in a hill, as their strength may be. In this way hop planting may be commenced in the fall, and such nursery sets will be more certain of growing than mere cuttings in the spring, and will generally produce more or less hops the following year. But in this country, as a general thing, spring planting will, perhaps, be found more convenient; and if done in good time, with a due observance of the things before mentioned, success may be depended on. A few nursery plants, however, should always be at hand, to replace in the fall such as may fall through the summer. In this way uniformity in the plantation, which is an important point to secure, may be obtained.

### Salt as Manure.

To the Editor of THE CANADA FARMER:

Sir,—My attention has been called to some expressions of doubt in the CANADA FARMER relative to the value of common salt as a manure, at which I feel great surprise. It is difficult to conceive that the practice of British and German Agriculturists in this respect, and the recorded experiments of Liebig and other agricultural chemists, should be so unknown in Canada as to require at this day an assertion of the great value of salt as a fertilizer. If the matter had to be treated as one of mere theory, it would be easy to account for the existence of a doubt as to the value of this mineral; because the majority of agricultural chemists, while teaching many fundamental truths, have mingled them with a great mass of error, by holding too stringently to the doctrine that, to preserve the normal fertility of the soil, we must add to it the precise mineral matters extracted from it by the crop, plus the constituents derived from the air. Salt is rarely found, and only in small quantities, in grass or grain, and therefore it may be supposed that it is but little necessary to their growth.

Manures are of three kinds; those which replace the minerals withdrawn from the soil; those which increase its power to attract nitrogen and carbonic acid from the atmosphere; and those which increase the sum of mineral matter in the soil available for plant food by increasing their solubility, and consequently their mechanical distribution. Of this last class is salt.

If the reader will refer to Liebig's "Letters on Modern Agriculture," he will obtain the results of experiments with salt as a manure which considerably astonished Baron Liebig, but led him only to the outer verge of a great agricultural discovery, of which I shall have more to tell you at another time.

In 1846 Kuhlman had found that the addition of 292 lbs. of common salt to the manure of a hay field increased the product 1,408 lbs., and later experiments gave a still larger increase; the general result being that whatever the manure used, its activity, as demonstrated by the increase of crop, was greatly stimulated by the addition of salt.

In 1857, the General Committee of the Agricultural Society of Bavaria made a series of experiments with salt as an addition to other manures at Bagenharsen, near Munich, which will be found detailed by Liebig in the work previously alluded to. He says of the result:—"In every case the crop was increased by the addition of common salt; when used with carbonate of ammonia it doubled the produce of grain, and with nitrate of ammonia it raised the return of corn 90 per cent., and of straw 120 per cent." In these experiments the quantity of salt used was only 6½ lbs. to 1,904 square feet of land.

Liebig then proceeds to account for the result by attributing it to the property which salt possesses of dissolving the earthy phosphates in the soil, and thus fitting them for plant food, but he overlooked its power also to render silica soluble for the same purpose. Salt upon grain crops gives a hard bright straw, with great strength and resistance, as well as increasing the product of both grain and straw. The rapidly diminishing product of the grain fields of this continent is due in a much larger degree to the absence of this solvent in the soil than to the exhaustion of potash and the phosphates. The very greediness that cattle show for it is an evidence that their natural food lacks this mineral; and I have seen cattle wintered on nothing but straw moistened with brine come out in the spring fat and sleek, when others that had their fill of good hay, and little or no salt, were mere bags of bones in lousy, mangy hides.

The quantity to be used on grass or grain depends greatly on the character of the soil, and must be determined by experiment. I have known twenty bushels used, and have seen the crop doubled with from eight to ten. In England, at the present time, great results are obtained by making a compost at the beginning of winter with 100 bushels of lime slacked with 6 bushels of salt dissolved in water; this is made under cover, and it is turned three or four times, and not used until six months old. The result is a chemical decomposition, partially double, which increases the activity of both substances, but I think hardly in a degree supposed.

Next Fall, I propose to give you the result of my own experiments, and perhaps to indicate another theory as to the peculiar action of salt as a solvent, and to point out the means by which our grain and grass crops may be enormously increased—that indeed by which nature formed our soils from apparently insoluble rocks, and treasured up in them the minerals necessary for tens of thousands of crops. In the meantime, I hope the farmers of Canada will give a fair trial to salt as a manure. They are invited to no new and doubtful experiment; the effect must be largely beneficial unless their land is in the highest possible condition of fertility as regards the solubility of the mineral plant food; in that exceptional and almost impossible case, if it does no good it can do no harm. I had almost forgotten to say that Mr. Lawes of England, a name well known to scientific agriculturists for his experiments on the relative value of manures, and his controversy with Liebig in opposition to the mineral theory, has thoroughly established the value of salt as a manure in every combination. The details of his experiments will be found in the transactions of the Agricultural Society of England.

A BELIEVER IN SALT.

Montreal, March 5th, 1867.

NOTE BY ED. C. F.—We have great pleasure in publishing the above excellent communication, though we think our correspondent has somewhat misapprehended the remarks in this journal to which he refers. It is true that salt has not been at all extensively used in Upper Canada as a manure; it is also true that its merits are not, on all hands, unquestionably admitted. Moreover, the best agricultural authorities in the world are at variance as to the merits of salt as a fertilizer. Hence we felt some reluctance about giving specific directions in regard to its use. We are glad, however, to find that one important end we have in view in the conduct of this journal is being accomplished, by inducing farmers themselves and men of practical knowledge to communicate to one another and to the public through these pages, the results of their individual experience. Our increasing correspondence is an encouraging assurance to us of the progress we are making, and the interest that is being aroused in agricultural science and practice; and it is further most gratifying to find that communications from our Canadian farmers have not only enriched our own columns, but have been copied from them and re-published by some of the first agricultural papers in England.