

FARM.

Sugar-beet Culture.

Dr. A. E. Shuttleworth Epitomizes Up-to-date Experience for "Farmer's Advocate" Readers.

Q. 1.—In your judgment, what classes of soils are most suitable for growing sugar beets?

Ans.—A clay loam with a clay subsoil is probably* preferable, including both yield and percentage results. Almost any soil, however, if properly manured and cultivated, appears to be fairly well adapted to the growing of sugar beets, except it be a deep muck or a very new soil, both of which should be avoided. A cold subsoil and a quicksand bottom are very bad.

2.—After what other crops do you find that sugar beets grow to best advantage?

Sugar beets grow to good advantage after fall wheat; after clover which was plowed down sufficiently early in the previous autumn to decompose the sod; after corn, and even following potatoes and turnips, we have in many cases good results.

3.—What class of manure do you advise, also when applied and how worked into the soil?

Farmyard manure applied in the fall sufficiently early to be worked into the soil for the purpose of rotting and for the germination of seeds, gives good results. We have not, as yet, used artificial fertilizers. Nevertheless, wood ashes, potash and phosphate fertilizers give good results. But at present, the use of farmyard manure and the cultivation of the beet in a proper rotation will give very satisfactory results to growers. It is always preferable to have early autumn cultivation and manuring of the soil intended for beets, followed by a deep fall plowing late in autumn.

4.—Outline the plan of spring cultivation you advise, and the implements best suited.

A spring cultivation, supposing it to be on fall-plowed land, should be to loosen and pulverize the soil to a depth of three or four inches, and this may be done as early in the spring as the land will permit. The fine seed-bed is best prepared by the alternate use of the roller, along with the cultivator and the harrow, and after thoroughly pulverizing the soil, it is then advisable to roll it firm. Experienced beet-growers naturally prefer sowing on the flat with the regular sugar-beet drill, which sows four rows at a time, placing the seed to a depth of about three-quarters of an inch; but for beginners there is no objection to moderately raised drills, not wider apart than 22 inches, on which the seed can be sown with an ordinary mangold drill, and the holes of the tin bands of which should be filed out with a rat-tail file, and so adjusted that about ten seeds to the foot will drop. After sowing, the drills should be rolled lengthwise with a heavy land roller, preferably twice, which packs the soil closely around the seed, causing it to moisten and germinate early. If thinning is done in time, the work can be accomplished with very little more trouble than that of thinning mangolds.

5.—How is the sowing done; how far apart in the rows; at about what time, and what quantity of seed is used per acre?

Sowing, as stated under 4, may be done on the flat or on ridges. The rows, or ridges, may vary in distance from 18 to 22 inches apart, to suit the grower, the soil, and the implements with which he has to work. Early sowing gives the best results, both in yield and quality of beet. I would sow the latter part of April, if the land were sufficiently dry and warm to warrant it. But it is always advisable to sow plenty of seed; otherwise, since many seeds do not germinate, the rows will be blanky, a condition that results always in a lower tonnage and a poorer test. From 15 to 20 pounds of seed is about what is required. We have growers in our county (County of Waterloo) having three years experience, who would now sow less than 20 pounds. We have others who do not appreciate the value of plenty of seed, but, generally speaking, our growers sow from 15 to 18 pounds of seed. Thick seeding not only warrants a full stand of plants, but it hastens the early growth of the young plants, which has two advantages at least: First, in the gain of time to the plant, which is a value both in yield and in quality of beet; and, second, in advancing the growth ahead of weeds, when thinning can be done with considerable less time and expense.

6.—At what stage of growth should the thinning be done; how and with what implements or tools? How far apart should the plants be left?

Thinning should be done when the plant is in what is known generally as its fourth leaf. The distance that the plants are left in the row should be, for the best practical results and economy in handling, about ten inches; and in this country, where labor is scarce, and if thinning is done in time, most of the hoeing may be done with the ordinary turnip hoe, made sharp and pointed at the corners. Some of our farmers get satisfactory results by first blocking with what is known as the "blocking machine," a new implement that will block as many as ten acres per day, and is drawn crosswise of the rows by one horse. It mulches the ground beautifully.

7.—How frequently is it necessary to cultivate, and with hoe or horse cultivator? What implement have you found best for the purpose?

I wish it could be impressed upon farmers that too much time should not be given to cultivation with the hoe. Hasten through the thinning with the hoe as

rapidly as possible. The main and the bulk of the cultivation should be done with the horse cultivator. The number of times to cultivate is a matter resting largely with the farmer himself. Growers very readily learn that every day the cultivator is kept in the beet field the grower earns not less than \$5.00, so valuable is the stirring of the soil in the promotion of growth in the beet. In a word, as a guide to the number of times necessary to cultivate, it may be said: Keep the ground clean, and never let a crust form. We cultivate at least once, and sometimes twice, before thinning, and usually three times after. Each time after thinning should run deeper, for the thorough stirring of the soil between the rows tends to produce a long, well-formed beet. We find it an advantage to deepen the cultivation each time after thinning, until the ground is stirred from four to six inches in depth. For the purpose of horse cultivating, we find that the regular beet cultivator known as the "Deere & Mansur" is very satisfactory, cutting the ground to a depth of about one inch close to the beets, without allowing any earth to be thrown on them. But any horse cultivator that will thoroughly loosen up the ground, leaving the surface level, will give satisfactory results. It is not advisable to either work the ground away from nor to the plants. The idea that sugar beets have to be "hilled" up is quite absurd. They will look after themselves if the grower will only keep the ground between the rows deeply and thoroughly stirred.

8.—About what acreage on an average 100-acre farm should be devoted to sugar beets the first and subsequent seasons?

We recommend that acreage which the farmer with his own available help can handle to best advantage, which usually varies from three to five acres per 100 acres of land. It is far better for a beginner to be satisfied with say one and a half to two acres, than to attempt more. The object of the grower should be not to add sugar beets as an additional root crop, but to introduce beet growing in a rotation in place of turnips. This applies particularly to beet-growers within reasonable distances of the sugar factory, or near stations to which the beet pulp can be shipped. Our beet-growers about Berlin teamed away not less than 3,800 loads in less than three months, and many carloads were shipped to outside growers. A farmer who has once experienced the feeding value of beet pulp, and who has once observed the cleaning and improving effect on the soil occasioned by the cultivation of sugar beets, will very readily introduce the beet crop in his rotation in place of turnips. A. E. S.

Profitable Sugar-beet Growing.

I take pleasure in giving you my experience with sugar beets, which I regard as the most profitable farm industry we have. My beets, unloaded in flat cars at our station, or, rather, freight and seed taken out, left me \$69.73 per acre. For beet-growing I like a heavy loam, but they will do well on rich, sandy loam. I used barnyard manure, plowed in deep. I plow and disk in the spring, the same as for potatoes, and roll solid. I sowed the seed about May 15th, just before corn-planting, with grain-drill set, as for peas, eighteen inches apart, on potato and corn-stubble land. I cultivate as soon as up, then "block" with hoe, six-inch cut, and have boys and women follow to weed and thin while from one to three inches high. I gave them three subsequent cultivations with harrow-tooth cultivator. A horse will go through an eighteen-inch space as well as four feet. By sowing at the season stated, the crop is completely under way by June 20th. My beets tested sixteen per cent. sugar.

Norfolk Co., Ont.

W. H. WATTS.

Grew Beets Testing over 17 per cent. Sugar.

Any soil suitable for fall wheat, corn or clover will produce a good beet crop. Mild clay and rich, sandy loams are the most desirable ones.

Sugar beets grow to best advantage after clover plowed down in the fall.

I prefer cow manure, cattle being bedded with cut straw, drawn from the stables in early winter and spread over the land at the rate of about ten tons to the acre, cultivated into the soil with a spring-tooth cultivator or disk as soon in the spring as the land is tillable.

After the land has been plowed in the fall, manured in early winter, cultivated or disked in early spring, harrow and roll until you get a fine, solid seed-bed, suitable for fall wheat.

I sowed the seed with a common twelve-hoed seed-drill, every third tooth sowing. This leaves the rows about twenty inches apart; and sow the seed not deeper than half an inch. I sow about the latter half of April or the first half of May—the earlier the better, if the soil is warm and dry enough. About fifteen pounds to the acre is the quantity which I sow, and find it satisfactory.

Thin as soon as possible after the beets get their second leaves. A common turnip hoe, about seven inches wide, is best for blocking. This leaves the beets about nine inches apart when thinned.

As soon as the beets appear in rows I go through them with a hand wheel-hoe, afterwards cultivating them three or four times with a one-horse cultivator, going through them once with a hand-hoe after thinning.

From an acre and a half to not more than five acres

on a 100-acre farm is enough to grow. Not less than an acre and a half should be grown, as this quantity assures a good carload.

These answers are according to my experience, and I have grown beets testing 17.1 per cent. Middlesex Co., Ont. JOHN CARSON.

Cultivate Beets Every Week.

Good clay loam, not too heavy, is preferable.

Clover sod, plowed in the fall and well manured, is the crop I find beets to do best after.

I advise barnyard manure, properly taken care of and fairly well rotted, put on in the fall before plowing.

I use the disk harrows as soon as the ground is fit to go on in the spring, then use drags every week until the weather is warm enough to put the seed in. If the weather turns wet, and weeds, such as thistles, get the start of the above plan, use the gang plow, then drag well, roll and drill.

I use a regular beet drill for planting, and have tried them 27, 21 and 18 inches apart in the row, but prefer 18 inches, and from 8 to 10 inches apart in the rows. Have put them in with seed-drill by fixing a heavy shoe on bottom of the teeth, so they won't go in too deep—from one-half to one inch is deep enough to put seed in ground. I use fifteen pounds of seed per acre, and find that plenty. The best time to plant is from first to twenty-fourth of May, if weather permits.

I cultivate just as soon as the beets are nicely up, then block them out with a six-inch hoe. Follow by hand-thinning. If the blocking is well done it makes the hand-work a lot easier. Don't leave them closer than from eight to ten inches in the row.

I cultivate once a week with horse cultivator. We have a regular beet cultivator. We give them a thorough good hoeing (by hand) about the middle of August.

If in a corn section, five acres is enough to grow on a 100-acre farm, but eight or ten can be handled where there is no other fall crop to take care of. A few well taken care of is better than a lot just partially handled. I began with four acres, then ten, then four, and have followed beets with a barley crop, put in by disking the ground in the spring, and have raised the best barley I have ever grown. H. J. FRENCH.

Kent Co., Ont.

Experimental Union Experiments.

To the Editor "Farmer's Advocate":

Sir,—Farmers' Institute speakers claim that the experiments carried on by the Experimental Union, an association of former students of the Agricultural College at Guelph, show that the use of fertilizers does not pay. This seems to us a misleading conclusion not justified by the results as obtained.

The report shows that complete fertilizers gave the greatest yield, while the next best yield was obtained by the use of nitrate of soda. If this means anything, it shows that the yield can be increased by using fertilizers, and that the average soil is especially lacking in nitrogen, but that the supply of this element in the form of nitrate of soda on oats does not pay under ordinary conditions.

No account has been taken of the fact that it is not necessary to buy the expensive nitrogen fertilizer, but that the nitrogen needed can be had free—absolutely free, as every up-to-date farmer knows—simply by raising leguminous crops, such as clover and peas, in rotation. These crops have the property of absorbing nitrogen from the air, which they store in their leaves and roots, and if these legumes be fertilized with potash and phosphoric acid (both of which are cheap), they will produce heavy yields, and leave much valuable nitrogen in the soil for the grain crop to follow. Thus by the simple use of mineral fertilizers we will increase our clover or pea crop, we will obtain more than enough nitrogen from the air for nothing to pay for the potash, and still have the potash in the roots of clover to benefit the next crop, which is as near solving the little boy's problem of how to eat his cake and still have it of anything I have yet heard.

The most economical way of using fertilizers in Canada is to utilize our steamed tankage, of which we now ship immense quantities to the United States, and supplement it by potash salts or wood ashes. These materials will provide the potash and phosphoric acid, in addition to some nitrogen, for a grain crop, and also leave a sufficient amount of mineral fertilizer in the soil to push on the clover crop. Thus the grain crop will be increased, a good crop of clover is insured, which in turn will add to the soil a store of the most expensive fertilizer—nitrogen—which has been abstracted from the air through the action of bacteria in the roots of the clover plant, which they are unable to do unless there is plenty of potash in the soil.

Surely this method of fertilizing pays. At least, we have seen hundreds of just such practical experiments carried on during the past couple of years in the United States by farmers, many of whom bought Canada packing-house tankage, supplementing it with potash, paid freight and profit to two or three middlemen, and made money in the end.

Now, if it will pay the United States farmers to buy our fertilizers and pay charges, it will certainly pay us to use them at home.

It is a short-sighted policy for an institute speaker to tell our farmers that we have not reached the time when it will pay to use fertilizers, encouraging us to