

a most successful beet culture. As we are now entering upon the new year and first year's growing, plow early and deep—10 to 12 inches—and thoroughly harrow and pulverize soil up to the day of seeding; and here let me say, the weeder in use to-day is an excellent tool to keep back young growth of weeds.

Rotation of Crops.—Special attention should be given to the condition of moisture in which the preceding crop leaves the soil. Three samples of rotation are given to guide the grower.

"First, a four-year rotation, with 25 per cent. beets:—(1) Winter wheat, with strong stable rotted manure; (2) beets; (3) summer crop; and (4) clover.

"Five-year rotation, with 20 per cent. beets:—(1) Beets, with artificial fertilizer; (2) summer crop; (3) clover; (4) rape seed; and (5) winter crop.

"Six-year rotation, with 5 per cent. beets:—(1) Beets, with well-rotted manure; (2) beets, with artificial fertilizer; (3) barley; (4) beets, with stable manure; (5) wheat or barley; and (6) clover.

Best Manure, When and How to Apply, is fairly well covered in preceding answers.

Best Time, Method and Machine Used in Seeding.—After thoroughly preparing the soil, plant as early as soil will permit, when warmed, in drills, 18 to 22 inches apart, using any of the popular seed drills now on the market. The Planet Jr. is among the best. Use plenty of seed: 15 to 18 pounds to the acre. It is easier to thin than to not have plants enough. Cover the seed with 1 to 1½ inches of soil. As soon as beets appear plainly enough to see four leaves, thinning should commence. A wide hoe in the hands of an energetic farmer will do much. Go through the row, cutting crosswise all plants, except every ten inches, then let girls or boys follow and thin to *One Good Healthy Beet Plant*. Follow this process with the cultivator, and keep diligently at it until all danger of weeds is over or lack of moisture is shown. Beets planted early will mature early and require less irrigation. The more thoroughly the soil is worked, the greater per cent. of sugar will the crop show.

The Sugar Content.—The presence of sugar in the beet is due to the chemical changes in certain of the constituents of the roots, which change is effected by the action of the sunshine. Accordingly, this process is conducted through the channel of the leaves. The beets well cultivated will have large strong leaves, and, of course, contain the most sugar. Smaller, long beets, also have the most sugar; grow them fast by cultivation. The sugar-bearing portion of the beet decreases toward the center, and in the center of a very large one there is no sweetness, but rather the flesh is salty. In a small beet the saccharine cells extend through the center and pervade the entire beet.

A Fair Average Crop is 16 tons to the acre, of 13 to 14 per cent. of sugar. As high as 20 tons, with 16 per cent., has been grown here. One grower had 10 acres. Result: 16 tons per acre; 14.2 per cent.; sold for \$81.80; cost, \$26; net profit, \$55.80.

Cultivators.—The ordinary corn cultivator, with narrow teeth, is used almost exclusively after plants are up. Many improved tools are on the market, which must be tried before recommending. Land should be harrowed and smoothed as fast as plowed, and then finished to a fine tilth. The retention of moisture in the upper layer of soil is absolutely essential for best results. One quite common error is the preparation for beets of new land or land a number of years in sod.

Harvesting.—Having grown your crop under the best conditions, the method of harvesting comes next; and again there are new and successful tools on the market. If the receipts are to correspond with the labor, then a tool that will dig and top beets will be a money-saver; but the potato fork, in the hands of a faithful worker, is the tool most in use. Let the boys follow and break off tops and throw the beets in piles, ready for hauling. Sugar beets do not spoil by freezing, but do by freezing and thawing. Many, therefore, leave the crop on the field until quite late, drawing them to the factory after other fall crops are cared for. Here they are weighed, and a percentage of dockage deducted for dirt and parts grown above earth. In Michigan, \$1.50 a ton is paid for 12 per cent. beets, and 33¢ added for all beets showing a percentage of sugar of over 12 per cent.

Purchase of Seed.—The companies all reserve the right to furnish their own imported seed, and the purchase price is deducted from sales on delivery.

The Sugar Quality varies from 11 to 18 per cent. of sugar.

The Average Cost of Production varies from \$26 to \$31, including every item of expense. To illustrate: Plowing (usually subsoiling), \$2.25 per acre; harrowing, \$1.00; seed, \$2.50; sowing, 50 cents; cultivating six times, \$2.50; thinning and weeding, \$7.00; pulling and piling, \$2.00; topping, \$5.00; drawing, average 2 to 3 miles, \$5.00. Total, \$27.75, a fair average.

Delivery.—Beets are delivered until quite late in the fall, companies generally running until long into December and January. It is profitable to haul six miles, and if railroad facilities are ample, then ship. A gain is thus made, owing to the delays in unloading from wagons, when the teams are generally so numerous. Although every facility is offered, farmers sometimes have to wait hours for their turn to unload. Many companies advance \$5 per acre after the crop is once under cultivation, which comes oftentimes as quite a blessing. There is no trading stock for sugar; you cannot as a producer obtain one pound of sugar from a factory.

Experience with Pulp.—The pulp of the sugar beet is valuable as a succulent food for cattle, especially so for fattening stock. A herd of 60 head will consume about two tons a day, only requiring a small amount of hay and no grain. Pulp is valued as high as \$3 a ton. In many localities it is given to the grower for the drawing; in other localities it is charged for at the rate of \$1 a ton. From one Michigan factory, the product goes up into Wisconsin to the stock yards, selling for 60 cents and freightage to be added. At \$1 a ton, it is a valuable and cheap food, demonstrating the need of securing this refuse. As a fertilizer, there are no authentic experiments, but the tops have certainly a value left to be plowed under. In the far West, experiments are being made in producing an article of syrup from sugar beets. The syrup is fine, with a pleasant flavor and desirable color. I regard this as being a grand introduction for future beet-sugar factories. Its use will be limited, no doubt.

In conclusion, let me say that the industry is well worth attention. The business of beet-growing resembles horticulture, and demands every attention to detail. The beet is a delicate, high-bred plant, and will resent very decidedly any neglect, by a reduction in tonnage, sugar content and purity; hence the importance of careful selection and preparation of soil, of seeding plentifully, of thinning just at the right time (when four leaves appear), and of thorough cultivation. Retain moisture near surface and work soil to a tilth immediately after plowing. Observe these rules and you can grow beets that will produce results like the following: One acre, \$70.31, lowest in all; 2 acres, \$180.71; 2 acres, \$159.99; 3 acres, \$293.98; 5 acres, \$317.85; 10 acres, \$630.91; 16 acres, \$1,265.05; 110 acres, \$8,331.05. These are facts as gleaned from a list of growers in Michigan last year.

"With the reputation the Canadian farmer has, there seems no reason for hesitancy. The industry is unattended by speculation, the price is fixed for each tonnage, and it only remains for him to so raise the crop that he will increase that tonnage and get the highest per cent. of sugar. W. S. STEVENS.
"Kent Co., Mich."

[EDITORIAL NOTE.—As to depth of plowing, that will depend somewhat on the nature of soil. We have seen fields damaged seriously by bringing to the surface a heavy, yellow subsoil. The beet does need, however, a deep, mellow soil to grow down into. In fattening cattle on pulp and hay, we fancy the Canadian feeder would be disposed to add a little grain to the ration.]

Sugar Beets a Boon to the Illinois Farmer.

Looking back over how I raised sugar beets last season, I would say:

1st—Take the best well-drained, level black land you have. It cannot well be too good. Be careful to keep it from washing.

2nd—Crops following beets should be oats, corn, and clover. I think beets can be raised continuously, if the land is well manured every year, but it is better to change off every two years.

3rd—Stable manure I consider best applied in the fall or winter, if convenient. Spring will do, if well rotted and spread as hauled. If this cannot be had, then use some other good fertilizer to take its place. Put on just before preparing the ground for sowing.

4th—The best time to plant is as soon in the spring as the ground can be put in proper shape, and is warm enough to germinate seed. We use a drill same as a wheat drill, arranged to sow your rows 18 inches apart, which it plants nicely, using two horses.

5th—Preparing Soil.—Plow thoroughly, at least six inches deep. When the ground is in condition, cultivate, harrow, and roll. Keep this up until you have packed the ground, and, at the same time, have a good seed-bed of two or three inches.

6th—Flat cultivation is best the first time; then cultivate deep with a tool made for the purpose; next surface cultivation, following several times. Then comes the hand weeding.

7th—How to Thin.—When the beets are about three inches high, take a seven-inch hoe and cut across the row, leaving between each cut three inches with the beets you wish to grow. After this is done, you go over the field, take out of the three inches left all but one plant, always leaving the best one. Then cultivate frequently.

8th—Harvesting.—September 15th is a good time to commence. We have a tool just the same as the nurserymen have for taking up trees, that straddles the row and cuts both sides and under the beet. This loosens the beet, so you take it by the top and lift it out easily. Leave all beets not pulled in the ground—they keep better. After pulled and piled, top them by cutting off the top just below the lowest leaf.

9th—Good land ought to produce from 18 to 30 tons per acre in a good season. I raised 24 tons, rich in sugar, per acre last season.

10th—A fair yield would be from 12 to 20 tons per acre. Cost, \$27.50 per acre. Price per ton, \$4.00. This is what we get here.

11th—Deliver as soon as harvested. Haul off as fast as taken out of the ground. This saves wilting, which is a loss to producer.

12th—Pulp is a good feed and also a good fertilizer. Take it all round, I consider the beet industry a godsend to this country.

McLean Co., Ill.

J. S. ROSS.

Long Distance Shipment of Sugar Beets.

A dark clay loam is preferable for sugar-beet growing.

Corn or barley may be grown between two crops of beets.

Barnyard manure applied with crop preceding beets is the best fertilizer.

Use hand drill, and sow as early as ground will permit in spring.

If the preceding crop is barley, plow the stubble as soon as harvested, and cultivate well, and plow deep in fall, cultivating shallow in spring to work up a good seed-bed.

Flat cultivation is the correct thing.

As soon as you can see the drills of plants, go through with a beet cultivator, then block and thin. Blocking is done with a hoe or a beet blocker by cutting the drills crossways, taking beets clean out of drill for 8 inches, leaving as small sections as you can between. Thinning consists in taking all the beets out of these sections except one plant.

There are several different kinds of beet lifters in use through this State.

Klienwanzlebener, a German variety, is a good sort.

From 15 to 20 tons per acre is a very good yield; cost of a crop about \$25 per acre. We get \$4.50 per ton for 12 per cent. beets, with the addition of 33¢ cents for every per cent. over that.

Delivery is from September to January. Where they are near a factory they are hauled with wagons; where they are distant they are shipped by railway. I would rather be a 100 miles from factory and near a railway than be 5 or 6 miles and have to draw with wagon.

I have not had any experience with the pulp as a feed or fertilizer.

Huron Co., Mich.

GEO. M. GRANT.

Proposed Western School of Agriculture.

Mr. J. H. Smith, M. A., Principal of the Ridgeway Collegiate Institute, who has had a lengthy and successful experience as an educator, advises us that he proposes organizing a farmers' school, to serve specially the needs of the Western peninsula of Ontario. It is to be opened in Ridgeway in October next, and the term will extend till March. Any one 16 years old or over, with a good public school education and a practical knowledge of farm operations, will be eligible for admission. There is no doubt whatever, as has often been pointed out in the FARMER'S ADVOCATE, that the public school course is weak in regard to subjects calculated to be of real service to the young man whose occupation is to be farming. In fact, the youth generally, including those living in cities and towns, would be greatly advantaged in their educational equipment for the work of life, were more rational methods pursued and greater attention paid to the natural sciences, thus training the observation and practical judgment of the scholar. Principal Smith has undertaken this plan at the solicitation of a number of the most progressive farmers of that part of the country, and towards which he has received much encouragement when speaking at Farmers' Institute meetings. The recognized need for more general agricultural education is apparent. In the light of present-day conditions, no one can seriously contend that such is not the case. In mapping out the course for the proposed school, everything that has not a direct bearing on some department of farming has been left out. The laboratory will be amply equipped to illustrate the principles and laws of the various sciences. The course of study is to include the following:

CORRESPONDENCE.

Special attention given to good, plain, rapid penmanship correct spelling, and the use of good English.

MATHEMATICS.

Arithmetic and mensuration; rapidity and accuracy in calculation; measurement of lumber, land, pits, bins, silos, mows, stacks, etc.; cost of feed and feeding; cost of tiling, draining, building and fencing; interest and discount; profit and loss in different farm operations.

BOOKKEEPING.

A complete system of double entry, specially adapted for the farm; use of stock register and field books; business forms, such as receipts, notes, drafts, cheques; contracts, commercial law.

PHYSICS.

The constitution of matter, measurements, weighing; farm mechanics, or the principles of farm machinery; the physics of solids, liquids and gases; heat and its effects; physical analysis of the soil; soil moisture and methods of controlling it; conservation and transformation of energy; the principles of electricity sufficient to illustrate its application on the farm. This course consists of class work, lectures and experiments.

CHEMISTRY.

The work of this course is general, embracing class work, lectures and experiments to illustrate the main facts, principles and laws of chemistry in their application to farm operations.

GEOLOGY.

Ten lectures giving a general outline of the various systems and formation; occurrence of useful minerals in Canada; soil and soil formation.

BOTANY.

Observation and description of plants, chiefly weeds; pollination, fertilization, germination, growth, dispersal of seeds; detection of seeds in samples of grains; the character of rust, smut and other injurious fungi, with their remedies. Special attention given to a few of the more important families, such as grasses, clovers, etc.

ZOOLOGY.

The chief divisions of the animal kingdom, with special attention to those forms which are either a benefit or an injury to the farmer, such as insects, birds, domestic animals; anatomy and physiology.

AGRICULTURE.

This course embraces a wide range of topics, a few of which are given below: Physical properties and classification of soils, tillage operations, manures, relation of certain plants to fertility, rotation of crops, drainage; breeds of cattle, horses, sheep