

## FARM.

## Successful Sugar-beet Growing in Michigan.

W. S. Stevens, Secretary of the Fruit-growers' Association of Grand Rapids, Michigan, a State that has made rapid strides in the beet sugar business, as our readers know, writes:

"In America, as well as in Europe, its promoters have demonstrated that raising sugar beets is valuable and feasible, that it is a success in its very inception, and that encouragement extended in its behalf is one of the best of investments. The farmer requires a diversified crop, so that in seasons of failure in one, he may have success with others. In the raising of sugar beets there is no monopoly, and he will find no lack of a market for all he can produce. It is apparent that the increase in the uses of sugar exceeds the increase in population. The average gain of consumption in the United States has been over 12 per cent., while the exact rate of increase in population is not over 3 per cent. All that seems necessary is to keep in mind the supply and demand, in order to get an intelligent idea of the future consumption of the sweet commodity. There is hardly one of the 79,000,000 inhabitants that does not use sugar to some extent. It's a luxury and a necessity, and as our people are becoming gradually 'better fixed,' there is an increasing tendency towards luxury. This presages a greater increase in this article as we progress. It is beyond computation to know the possible increase in its use."

"In answer to the 'Farmer's Advocate's' question as to the best practice, I will say, first, the physical basis for growing sugar beets is the quality and composition of the soil. Soils generally described as clayey, sandy loam or alluvial, or the black prairie soils, are best. The least favorable is a heavy, sticky clay. In general, a soil that will produce good corn and potatoes is well adapted to the sugar beet; reasonably level and well-drained preferred. A certain amount of moisture is absolutely necessary."

"What Crops to Grow Between Beet Crops.—This question is one that needs careful thought, as the soil plays so important a part. Soils well fertilized with well-rotted manure, one year previous to each crop, or with a commercial animal fertilizer, made up of bone, blood and potash, will produce a good crop of beets for several years in succession. Beets should follow wheat, or some cereal crop, or clover (not a timothy meadow), because the ground will early be available for fall plowing, a prerequisite to a most successful beet culture. This spring 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 50 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 the 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 18 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 \$84.80; cost \$26; net profit, \$58.80 per acre."

"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."

"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 two to three 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 \$5.00 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 \$3.00 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 \$1.00 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."

"Kent Co., Mich.

W. S. STEVENS.

## Best Value for Money.

Chas. H. Rowe, Lambton Co., Ont.: I am much pleased with your paper. It is a welcome visitor, and the best value for the money that any farm home can get. It should be in every home. I have received a great deal of valuable information from it."

## Ventilation of Stables.

An old subscriber, and an appreciative reader of this paper, has asked us to give him a few suggestions as to installing a system of ventilation in a stable 60x100 ft. Owing to the peculiarity of the site the front of the barn must face the north, but on the north side there is a good wind-break of trees. Our reader says he intended to put in tile at the top of the wall. Now, there are several very elaborate schemes of stable ventilation, and lengthy and learned reasons advanced why each should be adopted, but we have tried to discover a plan that is at once simple and easily installed, and yet conforms to all the rules of scientific hygiene. It seems to us considerable confusion in the minds of those most interested in ventilation has been caused by investigators claiming different actions for carbonic acid, the injurious and impure principle of stable atmosphere. Some have claimed that as this impurity is heavier than air, as soon as it is cooled to the average temperature of the stable it sinks to the floor. Others claim that although a heavy gas, it is easily diffusible in the air, and as warm air has a greater capacity for absorbing moisture or other impurities than cool air, and also is lighter, the carbonic acid is carried to the ceiling with the warm vitiated air, and should be removed there. Our experience has led us to agree with the latter contention, and the plans we here outline are in accordance with this theory."

In order to get a clear idea of how a system of ventilation should work, it is well to consider the stable a stove, and the ventilation system the dampers and flues. In a stove the oxygen of the air is utilized in combustion with the fuel, and the products of combustion (smoke, etc.) pass up the chimney. In a stable the oxygen of the air is utilized in the animal's body, and the products of the combustion, though in a slightly different form to smoke, rise to the ceiling, where they should escape. The whole problem then of ventilation lies in securing a good "draft," so to speak, in the stable, and at the same time to avoid cold drafts and keep the stable comfortable."

Considering the stable as a stove, then our object in ventilation will be to get an inlet of fresh air at the bottom and an outlet at the top. The system must be made to draw. To accomplish this, one of two ways should be adopted. First, the air should be introduced through a cowl at some distance from the barn (or some recommend from the top of the barn), and at a height of from fifteen to twenty feet from the ground (sometimes the air is admitted this way without a cowl, simply through a horizontal pipe), conducted through pipes to the passages in front of the cattle, and introduced to them through branch pipes. This system was outlined in our January 7th number."

The other plan is to put U-shaped pipes in the wall, just at the ground level, to introduce the air without giving it a direct course into the stable. These pipes should be put on all sides of the barn in order to insure fresh air in the stable, no matter from which side the wind is blowing. This inlet pipe might be modified by using a tile in the wall near the floor to admit the air, and a casing of some kind on the inside to break the force of the in-current, and cause it to rise. Whatever the system of inlet pipes, the outlet should be as straight as possible, and near the center of the stable. In large barns it would be best to have two or three of these outlets. Close-fitting wooden flues are the best. At the top they should be covered, but open on all sides to give a free draft. In these flues, as near the bottom as possible, have dampers that can be closed when the stable is empty, or practically closed when winds are very high and the air in the stable, consequently, changing rapidly. Tile pipes in the wall at the ceiling, though they do good in some cases, are not in the best place, and frequently permit unhealthy drafts to blow across the stable, unless provided with some ready means of closing them when necessary."

No provision need be made for checking the income of fresh air except the dampers in the outlet pipes, for as soon as they are closed the pressure of the air inside the stable becomes greater than that without, and, consequently, no air is admitted to the stable. One thing to be observed in these ventilating systems is to have all other openings about the stable closed and the flue tight. Everyone is familiar with the effect of an open damper in a stovepipe, and an opening in the outlet pipe of the ventilating system acts similarly. In correspondent's case we would use three outlet pipes. As a sure precaution, plenty of room should be provided in the stable. Passages should be wide, and the ceilings high. Locations play a very important part in ventilation, and it is well to be prepared for unaccountable conditions."

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