

PRODUCING SUGAR BEETS

BY G. F. WENNER



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Increased yields and profits in sugar beet culture depend upon observance of certain definite principles in handling the crop. Brief summary and discussion of these effective methods follow.

SELECT FIELDS having the best conditions for high production. Well drained, heavy, fertile soils which are relatively free from weeds should be chosen for this special crop.



Fig. 1. A good stand is necessary for a high yield.

SOIL TYPES commonly known as loam, silt loam and clay loam are adapted to sugar beet culture in Michigan. Some sandy soils which are high in fertility and organic matter are producing beets successfully. With proper fertilization certain muck soils are giving high yields of good quality beets. Recent work at Michigan State College indicates the probability that varieties especially well suited for growing on muck will be developed.

PROVIDE GOOD DRAINAGE to obtain consistently high yields. Beets will withstand an unusual amount of excess water, but some injury occurs under such conditions. A good crop of beets will often show a sufficient profit in one season to cover the cost of tile drainage for the field. A well drained soil is more easily fitted for beets and allows for earlier planting. Drainage is a very good form of crop insurance.

LIME ALL SOILS SHOWING ACIDITY. Beets grow best on a neutral to slightly alkaline soil. Conditions which permit the successful production of alfalfa and sweet clover are usually satisfactory for beets. The sugar companies are pleased to have farmers make

use of the lime refuse at the factories. Two cubic yards of this lime are approximately equivalent to one ton of ground limestone.

FALL PLOW FOR BEETS when possible and plow deep enough, on most soils, to bring a small amount of subsoil to the surface. Fall plowing is important in heavy production because it increases the available plant food, conserves moisture, improves the soil condition, and permits early planting. Spring plow as early as possible when fall-plowed land is not available. In many cases where the soil has been left in a mellow condition in the fall and the field is free from trash such as corn stalks and weeds, farmers are finding that disking in the spring gives as good or better results than spring plowing.



Fig. 2. Fertilizer with the seed stimulates early growth.

PREPARE A SEEDBED in which the surface is in fine tilth and the lower section of the furrow slice is firmly compacted. Disking before plowing will aid in obtaining a firm soil. The disk, spring and spike-toothed harrow and cultipacker are commonly employed in preparing the seedbed for beets, and the surface is often smoothed with a float before seeding. Extreme care in plowing, fitting, planting and cultivating will pay good dividends in the results obtained.

PLANT BEETS AS EARLY as conditions are favorable for quick germination and growth. Early beets under favorable climatic conditions usually out-yield those seeded at a late date by several tons per acre. When early weather conditions are not ideal, it is advisable to plant at a later date. Quick germination and rapid growth are helpful to the control of weeds and soil condition. Large acreages are usually planted at intervals through the planting season to spread the cultivating and hand labor over a longer period. Under average

conditions get the seed into the ground during the early part of May. In some areas it is necessary to wait until June before the soil has warmed sufficiently for quick germination. Planting later than June 15 is not advised.

PLANT PLENTY OF SEED to insure a good stand. Fifteen to eighteen pounds of seed per acre, depending on the width of rows, seedbed preparation and soil conditions, is the amount commonly used. Quick germination is aided by planting just deep enough to cover the seed successfully and to reach the soil moisture. Beets planted early should be about one inch deep while those planted at a later date may have to be planted deeper to reach moisture.

FERTILIZERS APPLIED FOR SUGAR BEETS result in quicker germination, healthier plants and heavier production. The sugar beet crop is a high value crop which responds well to fertilizer and has a better chance of paying for the fertilizer than other crops. Ordinarily, increases in yield of from two to five tons may be expected from the application of the proper amount of the recommended fertilizer. Buy fertilizers according to analysis, and buy the fertilizing elements in the amounts necessary to supplement the available plant food already in the soil.

STUDY THE FERTILIZER REQUIREMENTS of each field, because soil conditions vary even in adjacent fields. Consider the natural fertility of the soil, the drainage, the previous crops, the amount of manure applied, the amount of clover or alfalfa sods or crops plowed down and the requirements of the crop to be sown. Most of the sugar beet soils of Michigan require a high percentage of phosphoric acid in the fertilizer; many soils indicate a need for some potash; while soils which are not in a good state of fertility require a small percentage of nitrogen, especially if alfalfa, clovers or manure have not been used in the rotation.

THE GENERAL FERTILIZER RECOMMENDATIONS for sugar beets by the Soils department of the Michigan State College, as outlined in "Fertilizer Recommendations for 1937" are as follows:

Table 1. For loam, silt loam, and clay loam soils.

GROUP 1	GROUP 2	GROUP 3
No alfalfa or clover recently. Not recently manured.	In alfalfa or clover recently. Manured recently.	In alfalfa or clover recently. Recently manured.
4-16-4 or 2-12-6 or 2-16-8	4-16-4 or 0-14-6 or 0-20-0	0-14-6 or 0-20-0

Apply 100 to 200 pounds in the row at planting time. Where larger applications are to be made plow under 200 to 400 pounds and apply 100 to 200 pounds in the row. Where fall plowing is practiced, plow under 0-14-6 or 0-20-0 and if needed apply a complete fertilizer in the spring. Larger applications in contact with the seed may prove injurious.

Table 2. For muck soils.

Where two fertilizer analyses are given, the first is generally preferred. See footnotes at bottom of table for response of crop to copper sulphate and salt.	Annual Broadcast Application Pounds per Acre	TYPE OF MUCK			
		High-Lime Muck		Low-Lime Muck	
	In general the higher the analysis, the less the amount required per acre	Deep and Medium Muck properly drained, not acid to strongly acid	Shallow Muck, Alkaline Muck, or Poorly Drained Muck	Very strongly acid in reaction	
				Limestone or Marl should be applied preceding fertilization.	
300-600	0-8-24	0-8-24	0-8-24 or 2-8-16		
	Row application advisable for sugar beets, not more than 150 pounds with seed, or not more than 300 pounds if 2 inches from seed. If more is applied, drill in before planting. In addition to fertilizer, 500 to 1000 pounds salt per acre advisable.				

- (1) Fertilizer mixtures having the same ratios as those recommended, but of high or lower analysis, would be equally desirable, a proportionately smaller or larger amount per acre being needed by the crop.
- (2) Sugar beets may respond to copper sulphate when grown on acid muck.
- (3) If muck has not been heavily fertilized in past, sugar beets are likely to respond to salt in fertilizer mixture.

County agricultural agents, sugar company agriculturists and the Michigan State College, will gladly assist farmers in their study of fertilizer requirements for sugar beets.

PLANT IN ROWS as narrow as plans for cultivation will permit. Tonnage is largely determined by the number of plants at harvest time. Planting in 20- to 24-inch rows will give more plants per acre than wider rows. Check rowing 18 by 18 inches and hilldropping show some promise for sugar beet growers.

AVOID CRUSTS which may form over the seed under certain conditions. The cultipacker is often used immediately after seeding to leave the surface soil in good condition and to pack the soil around the seed, or it is used later to break any crust which develops. The use of the roller or cultipacker after beets are thinned is advisable under some soil conditions to pack the soil around the roots of the plants or to break down an uneven, lumpy surface.

CULTIVATE AS SOON as it is possible to see the rows and as often as is necessary to control the weeds and to keep the soil from excessive cracking. Early cultivation should be reasonably close to the row and may be fairly deep, while later work should be farther from the rows and shallow. The feeding roots of beets grow close to the surface of the soil and should not be pruned or damaged by deep cultivation. Careful and effective cultivation with properly equipped

tools is very essential to weed control and surface condition. Properly prepared fields will require less work to keep them in fine condition.

HAND LABORERS should be carefully supervised. Proper blocking, thinning, hoeing and harvesting are necessary for maximum yields.

BLOCK AND THIN the beets to the desired stand just as soon as conditions will permit. A beet every 12 inches at harvest time is considered a perfect stand by most growers. 8- to 12-inch spacing in the spring, depending on the width of rows, is generally necessary to provide a good stand in the fall. Uniformity of spacing between beets at harvest time is important in making full use of the land. Also, make certain that the laborers leave sturdy, thrifty plants, for the yield will be greatly influenced by the plants which are selected. Avoid "doubles" as much as possible.



Fig. 3. No fertilizer vs. fertilizer.

CONTROL THE WEEDS to increase production. A well prepared seedbed is the first step to take in this direction. Cultivation and hoeing should be often enough to control the weeds while they are still small.

HARVEST BEETS as late in the fall as practical, but avoid the danger of freezing in the ground. Maximum sugar per acre should be the chief consideration, along with tonnage. See that the topping is done properly to obtain the highest possible net tonnage of beets. The crown of the beet is removed by cutting through the beet at the lowest leaf scar.

AFTER TOPPING take care of the beets immediately. Beets that cannot be delivered directly after topping should be covered with tops or pitted to prevent loss of moisture.

PITTING ON THE FARM is advised where there is danger of carriers being kept off the field by adverse weather. Haul the beets

out of the field immediately and pile at some readily accessible place. The pile should be covered with loose material such as corn stalks or straw to prevent alternate freezing and thawing of the beets.

SPREAD THE BEET TOPS and disk them into the ground or plow them under during the fall, in order to return to the soil the largest possible amount of plant food and humus.

FEED THE TOPS TO LIVESTOCK if the feed is required, for the tops are good roughage. In feeding the tops to dairy cows, a few precautions should be observed: (1) Off-flavors in the milk are greater when tops are fed at milking time than if fed before or after milking; (2) Do not store tops in the same room in which the milking is done, and (3) It is safe to feed up to 25 pounds of tops with a hay and grain ration.

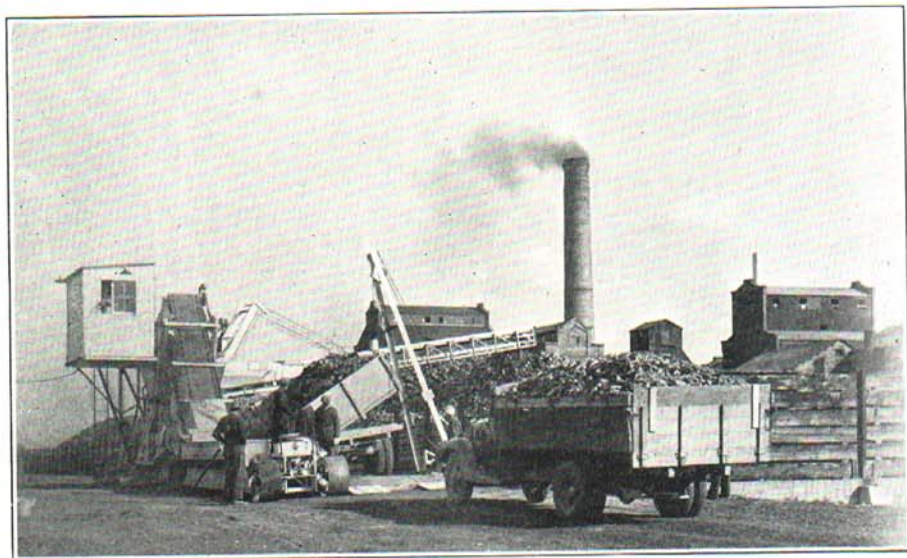


Fig. 4. Delivery is speeded up by modern unloading equipment.

BEETS CAN BE GROWN regularly in three, four or five year rotations under proper conditions with satisfactory results. If sufficient attention is given to the use of green manure crops, barnyard manure and commercial fertilizer, soil fertility can be maintained with this crop grown in the rotation.

A GOOD CROP ROTATION is as necessary in obtaining high yields of sugar beets as it is in the economical production of other crops. A recommended rotation commonly used in Michigan includes three years of hay or pasture followed by corn or beans succeeded by sugar beets and the beet crop followed by a spring grain crop seeded to a legume.

Sugar beets are sometimes grown directly after a legume crop, but in a bad disease year they are less affected if the beets follow a cultivated crop. Planting beets after beans or corn also makes the control of weeds a much easier task.

THE MOST PROFITABLE RETURNS from beets are obtained by those who constantly strive for higher yields by applying approved practices. Plan for sugar beets as a regular crop where conditions are favorable. A uniform and full production will help to maintain this important crop industry with the largest profit to both growers and manufacturers.

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