

The Salem District Should Grow and Make All the Syrups and the Sugar Used in the Industries and in the Homes of This City and Its Environs

BEET SUGAR SYRUP MAY BE MADE AT HOME, SAY THE EXPERTS OF UNCLE SAM

All You Need Is a Spade, a Hoe and a Rake, to Raise the Beets, and a Butcher Knife or Kraut Cutter, a Barrel and a Kettle, to Get the Beets Ready and Boil Down the Juice

"Sugar-Beet Sirup" is the title of Farmers' Bulletin #23 of the United States Department of Agriculture, published in May, 1917. The entire text of this bulletin is printed below, as, in the opinion of the writer, it is of great importance to the people of this district.

This bulletin tells how to grow sugar beets in the garden and describes a simple process of making from them a palatable and nutritious table sirup with a pleasant flavor. A patent for the process of making the sirup has been issued to the authors of this bulletin for the benefit of the public, so that any one is free to use it. Tests by farmers as well as the department have proved the process to be practicable.

Sugar beets may be grown in any locality which has tillable soil that is capable of producing good crops of vegetables. A small piece of ground is sufficient for planting a few rows of beets—enough to furnish the family with sirup. The tools needed are necessary in almost any garden operation—a spade, a hoe, and a rake.

GROWING SUGAR BEETS FOR SIRUP.

The production of beet sirup consists of two distinct operations: (1) The growing of the raw material, the beets; and (2) the making of the sirup. (A patent for this process of making sirup from sugar beets (patent No. 1155896, Oct. 5, 1915) was issued to the authors of this bulletin, H. C. Gore and C. O. Townsend, U. S. Department of Agriculture. Tests of the process were made by farmers, under the direction of Mr.

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William H. Burns, of the office of Sugar-Beet Investigation, assisted by Mr. Charles G. Crawford, a collaborator in the same office. The sirup making embraces two essential operations, the extraction of the juice from the roots and the reduction of this juice to the desired consistency.

Sugar beets may be grown and sirup produced in any locality which has tillable soil capable of producing good crops of vegetables. Therefore, anyone having a small piece of fertile, tillable ground and the usual garden implements, a spade, a hoe, and a rake, is equipped to grow the beets necessary for the production of a home supply of sirup. In some localities the beets produced are richer in sugar than they are in other localities, but all sugar beets, if properly handled, are capable of producing sirup. The richer the roots are in sugar, the larger the quantity of sirup that may be produced from a given quantity of roots and the less the time that will be required to reduce the juice to the desired consistency.

To those who are not familiar with the growing of sugar beets, the following brief directions and suggestions may be helpful.

Selecting the Land.

The ground selected for growing the beets should be well drained and fairly fertile. Extremely poor, shallow, sandy, or hard soil should not be used for beets until it has been put in proper condition for crop production; likewise, ground that has been very heavily manured should be avoided, since such soil sometimes produces very large roots, poor in sugar. A few rows of sugar beets in the garden will generally be sufficient for a supply of sirup for home use. A bushel of beets will produce from three to five quarts of sirup. Beet roots when mature should weigh from 1 to 2 pounds each; hence, 30 or 40 average beets will make a bushel. These facts will enable one to estimate the area that will be needed to produce the home supply of sirup.

If more beets are grown than are necessary for the sirup supply, it should be borne in mind that they are excellent for the table. When partly grown the entire plant may be used as green, and when mature the roots may be cooked and served like garden beets. All sugar beets are white, but when properly grown they are generally much richer in sugar than the garden beet and just as tender. Sugar beets, either raw or cooked, are excellent food for chickens, hogs and other live stock.

Preparing the Seed Bed.

Having selected a suitable place for growing the beets, the ground should be plowed or spaded to a good depth, remembering, however, that too much raw soil should not be brought to the surface at one time. The reason for a deep root bed for sugar beets is apparent from the

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either for sirup-making purposes or for seed production. The simplest and least expensive method of storing the roots is to throw them into a pile on the surface of the ground, selecting for this purpose a well-drained spot. Dirt should then be thrown over the pile until it is almost covered. If the weather is mild, the top of the pile should be covered very lightly or left entirely open for a few days until the roots have passed the heating stage. As the weather gets colder more dirt should be added, to prevent the roots from freezing and to keep them from wilting.

The second method, namely, the pitting of roots, is accomplished by digging a hole or pit in a well-drained place, the size of the hole depending upon the quantity of roots to be stored. The roots should then be placed in the hole and the surface covered with dirt, lightly at first, and the covering increased as the weather gets colder. If the beets are stored in cellars they should be packed in moist sand or covered with a layer of dirt to keep them from wilting. The two points to be kept in mind in storing beet roots are (1) to keep the roots cool without letting them freeze and (2) to keep them from wilting. They will work up much better if they are kept fresh and crisp, although the wilting does not materially change their quality.

Sugar-Beet Seed

Those who are interested in the making of beet sirup from year to year, especially in cooler portions of the United States, may grow their own seed if they so desire. Just how long seed can be produced in this manner without serious reduction in the quality of the roots has yet to be determined. However, the indications are that at least several generations of beet plants may be produced without reducing the quality of the roots too low for sirup-making purposes. Two growing seasons usually are required for the production of sugar-beet seed from seedling plants. It is necessary, therefore, that the beets produced the first season be gathered in the fall and stored in a cool, dry place until the following spring. In case the beets are to be used for seed production they should not be topped, but the leaves should be removed either by twisting them off or by cutting them off with a sharp knife without removing or injuring any part of the crown. In this condition the beets should be stored until spring. They should be planted in a well-drained soil, such as wheat, oats, or barley on which clover is seeded in February. The clover may be left one or in some cases two years and then be plowed up and the field again put into sugar beets. We need, in the Willamette valley, cultivated crops for our rotations; yet there are but few cultivated crops that can be grown on an extensive basis that will yield cash and give desirable results. We have a few crops which are ordinarily cultivated in sections where there is a limited use for each of these as cash products, with the possible exception of the potatoes. It is, therefore, desirable to introduce some deep-rooted root crop capable of improving the physical condition of the soil and at the same time giving a valuable cash return. About the best crop that presents itself under these circumstances is the sugar beet.

As a plant, it is adapted to rather warm, sunny sections that are well supplied with moisture. It has long been known that the success of sugar beet culture depends to a considerable extent upon the sunlight of the locality and it is therefore usually not a good plan to attempt to grow beets in sections where there is a large amount of summer cloudiness. It has also been stated that sugar beets are great removers of soil fertility, and it is true that considerable amounts of nitrogen and potash are taken away but, on the other hand, the sugar beet pulp is brought back from the factory and fed to the stock, thereby practically none of the fertility which escapes. Also if sugar beets are grown in a good rotation with clover, it is very likely that the fertility conditions of the soil will improve rather than run down as a result of the culture of this crop. The other most desirable feature of the sugar beet crop, aside from its ability to cultivate alone, is that it means a considerable cash return for each acre in beets if that acre is properly handled. The yield of beets varies from ten tons per acre up to, in some cases, as much as 16 to 20 or more tons, when grown under very favorable conditions and if yields of 12 tons or better are secured, there is money in the culture of sugar beets.

On the other hand, there are certain obstacles to overcome and certain factors which may appear to be disadvantageous to this industry. In the first place, it requires a considerable amount of capital to build and to operate the factory and to provide working capital for growers of the sugar beets. This large amount of capital is in active use only for a relatively short season as the sugar making campaign does not normally extend over from ninety to one hundred and twenty days. However, numerous factories at places where beets are produced successfully, have plainly demonstrated that the investment is a paying one so the principle obstacle to be overcome is that of securing a sufficient acreage of beets for a long enough period of time that the plant may be assured of raw material on which to work. The difficulty is to secure enough farmers interested in the culture of beets on a small scale who will bring up the total acreage to about 5000 or more acres for the factory. It is not advisable to have a few with extremely large acreages for the reason that the crop is one with which most farmers are not familiar and one who has had no experience with the crop is in great danger of failure if a large acreage is undertaken. Five to ten acres the first year is enough while one is gaining experience. After having learned the ins and outs of sugar

Caring for the Plants.

As already stated, the seed should be planted in solid rows or in hills. When a solid or continuous row the plants should be blocked. Blocking consists of cutting out with a hoe or other implement a part of the plants so that the remaining beets stand in tufts about 10 inches apart. In blocking, the direction of the stroke should be at right angles to the row. As soon as the plants are large enough to be handled conveniently, they should be thinned to one plant in each hill or tuft. This operation must be done by hand, since the plants in the hills or tufts stand very close together. The plants should be cultivated and hoed from time to time in order to keep down all weeds and to furnish the best possible conditions for growth.

If the natural water supply is not sufficient, the beets should be irrigated when they show signs of needing moisture for their proper growth and development. If the beets are during the day and fail to recover at night, they should be watered. In case of irrigating, a furrow should be made several inches from the beet row and the water should be allowed to run down this furrow until the ground is thoroughly wet. In no case should the surface of the ground be flooded, often causes a crust to form around the beet, cutting off the air supply from the root and thereby retarding the growth of the plant. From one to three irrigations should be sufficient in most sections where the rainfall is not abundant enough to produce satisfactory beets.

Harvesting the Beets.

In most sections of the country from four to six months are required for the beets to reach their proper size and stage of development. The proper stage for harvesting will be indicated by a yellowish tinge of the foliage and by the fact that the beets when pulled leave the ground almost free from dirt. If the patch of beets is large the roots should be loosened by means of a so-called lifter, of which there are two kinds, the double-pointed and the side lifter. The latter is similar in appearance to a subsoil plow and is operated alongside the beet row, loosening the beets without breaking them. The plants then can be pulled and thrown into piles or rows. If the patch of beets is small and a lifter is not at hand, the beets may be loosened by means of a spade or a 2-tined lifting fork and thrown into piles. The beets should then be topped by cutting them off squarely at the point where the lowest leaf was attached. The topping can best be done by means of a heavy knife; usually a single stroke is sufficient to top a beet. The roots can then be made into sirup at once, or they may be stored until a more convenient time.

Storing the Roots.

The roots may be stored either on the surface of the ground or in a pit or a cool cellar and kept for several months. The following suggestions will be helpful in storing beet roots.

THE GROWING OF SUGAR BEETS IN OREGON, ACCORDING TO THE LATEST O. A. C. BULLETIN

We Need Such a Crop Here, for Inter-tillage of Lands—Sugar Beets Fit Into Rotations Very Well—Our Climatic Conditions in General Are Favorable—The Directions for Culture

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Comparative world total production of beet sugar and cane sugar in metric tons is as follows: In 1916, beet 50,900; cane 1,100,000; 1919, beet, 5,502,970; cane, 8,566,814. Germany, Russia, Austria Hungary, France and the United States are leading producers of beet sugar in the order mentioned.

Here in this section, we have for a long time needed some cultivated crop in order to give us the benefits from inter-tillage on lands which have been producing little but cereals and certain types of hay. Successful beet sugar culture means tillage and that the crops must be rotated, because sugar beets grown alone rapidly decline in yield, while on the other hand various crops grown in a rotation with sugar beets are usually greatly benefited by the careful culture which must be given a paying crop of beets. The fact that the land is carefully hoed and cultivated throughout the summer, that it is occupied by a very deep rooted plant, and that the soil is deeply stirred in the fall in harvesting the beets makes the crop a particularly desirable one to include in a rotation.

Sugar beets fit into rotations very well. Systems may be used, usually consisting of sugar beets one year, followed by fall-sown cereal, such as wheat, oats, or barley on which clover is seeded in February. The clover may be left one or in some cases two years and then be plowed up and the field again put into sugar beets. We need, in the Willamette valley, cultivated crops for our rotations; yet there are but few cultivated crops that can be grown on an extensive basis that will yield cash and give desirable results. We have a few crops which are ordinarily cultivated in sections where there is a limited use for each of these as cash products, with the possible exception of the potatoes. It is, therefore, desirable to introduce some deep-rooted root crop capable of improving the physical condition of the soil and at the same time giving a valuable cash return. About the best crop that presents itself under these circumstances is the sugar beet.

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In cleaning the roots, they may be placed in a tub or other suitable receptacle and covered with cool water, to soften the roots and to make the roots more crisp. After soaking for a few minutes, until the dirt is loosened, they should be thoroughly scrubbed. A coarse brush with stiff bristles or wire is useful in this work. After the roots are thoroughly washed they should be cut into thin slices. A 3-bladed kraut cutter secured by fastening on the top of a barrel, has been used in field experiments and found very satisfactory. The upper head of the barrel should be removed, so that the beet slices will fall directly into the barrel. If a kraut cutter is not at hand, any slicing device, the simplest of which is a butcher knife, will be satisfactory. The slices should be very thin; the thinner the slices the more rapidly the sugar is extracted. In field experiments slices only one-sixteenth of an inch in thickness were obtained. The slicing box of the slicer was not used, the beet root being held in the hand and pressed against the blades of the slicer.

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(Continued on Page 4.)

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Here in this section, we have for a long time needed some cultivated crop in order to give us the benefits from inter-tillage on lands which have been producing little but cereals and certain types of hay. Successful beet sugar culture means tillage and that the crops must be rotated, because sugar beets grown alone rapidly decline in yield, while on the other hand various crops grown in a rotation with sugar beets are usually greatly benefited by the careful culture which must be given a paying crop of beets. The fact that the land is carefully hoed and cultivated throughout the summer, that it is occupied by a very deep rooted plant, and that the soil is deeply stirred in the fall in harvesting the beets makes the crop a particularly desirable one to include in a rotation.

Sugar beets fit into rotations very well. Systems may be used, usually consisting of sugar beets one year, followed by fall-sown cereal, such as wheat, oats, or barley on which clover is seeded in February. The clover may be left one or in some cases two years and then be plowed up and the field again put into sugar beets. We need, in the Willamette valley, cultivated crops for our rotations; yet there are but few cultivated crops that can be grown on an extensive basis that will yield cash and give desirable results. We have a few crops which are ordinarily cultivated in sections where there is a limited use for each of these as cash products, with the possible exception of the potatoes. It is, therefore, desirable to introduce some deep-rooted root crop capable of improving the physical condition of the soil and at the same time giving a valuable cash return. About the best crop that presents itself under these circumstances is the sugar beet.

As a plant, it is adapted to rather warm, sunny sections that are well supplied with moisture. It has long been known that the success of sugar beet culture depends to a considerable extent upon the sunlight of the locality and it is therefore usually not a good plan to attempt to grow beets in sections where there is a large amount of summer cloudiness. It has also been stated that sugar beets are great removers of soil fertility, and it is true that considerable amounts of nitrogen and potash are taken away but, on the other hand, the sugar beet pulp is brought back from the factory and fed to the stock, thereby practically none of the fertility which escapes. Also if sugar beets are grown in a good rotation with clover, it is very likely that the fertility conditions of the soil will improve rather than run down as a result of the culture of this crop. The other most desirable feature of the sugar beet crop, aside from its ability to cultivate alone, is that it means a considerable cash return for each acre in beets if that acre is properly handled. The yield of beets varies from ten tons per acre up to, in some cases, as much as 16 to 20 or more tons, when grown under very favorable conditions and if yields of 12 tons or better are secured, there is money in the culture of sugar beets.

MAKING SIRUP FROM SUGAR BEETS.

Preparing the Roots.

The first step in making beet sirup consists in topping and cleaning the roots. As already stated, the crowns should be cut off at the point of the lowest leaf scar. The reason for this is that the crown or upper part of the beet contains a large part of the salts taken from the soil in base process of growth. It is desirable to have the sirup as free as possible from these mineral salts which if present in too large quantities, would render the sirup unpalatable.

In cleaning the roots, they may be placed in a tub or other suitable receptacle and covered with cool water, to soften the roots and to make the roots more crisp. After soaking for a few minutes, until the dirt is loosened, they should be thoroughly scrubbed. A coarse brush with stiff bristles or wire is useful in this work. After the roots are thoroughly washed they should be cut into thin slices. A 3-bladed kraut cutter secured by fastening on the top of a barrel, has been used in field experiments and found very satisfactory. The upper head of the barrel should be removed, so that the beet slices will fall directly into the barrel. If a kraut cutter is not at hand, any slicing device, the simplest of which is a butcher knife, will be satisfactory. The slices should be very thin; the thinner the slices the more rapidly the sugar is extracted. In field experiments slices only one-sixteenth of an inch in thickness were obtained. The slicing box of the slicer was not used, the beet root being held in the hand and pressed against the blades of the slicer.

Extracting the Sugar.

A bushel of beets will make approximately 2 bushels of slices, which should be placed in a barrel and covered with hot water. About 10 gallons of water will be required to cover them. An excess of water should be avoided, since it would increase the amount of evaporation required to reduce the solution to the desired consistency. If boiling water is used, the temperature of the slices

DATES OF SLOGANS IN DAILY STATESMAN

(In Twice a Week Statesman Following Day)

- Loganberries, Oct 9
- Prunes, Oct. 16.
- Dairying October 23.
- Flax, October 29.
- Viburnum, Nov. 6.