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SWEET POTATOES
by
A. G. B. Bouquet
Vegetable Crops
Oregon State College

Federal Cooperative Extension Service
Oregon State College
Corvallis

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SWEET POTATOES

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While it may be a popular opinion that sweet potatoes cannot be successfully grown in Oregon, nevertheless the production of crops of "sweets" on the Experiment Station grounds at Corvallis, as well as on land of individual farmers in certain areas of the state, is sufficient evidence that tubers of excellent yield and quality can be grown and matured, particularly in the Willamette Valley, southern and part of eastern Oregon.

Climatic requirements. The season for sweet potatoes must be frost-free for approximately 120 to 130 days. The plants are subject to frost injury both in the late spring at a time when plant setting is usually done and also in the fall of the year when autumn frosts occur. The crop should grow, therefore, under conditions in which the days are warm and the night temperatures high enough so that the plants are not chilled. Cold nights are not favorable to sweet potato growing and the fall season should be frost-free long enough to permit of the proper development of the tubers. An abundance of rain in the fall is not desirable because it encourages too much foliage growth of plants at the expense of the development and maturity of the tubers. In practically all areas of the state where sweet potatoes might be grown, it is advisable to irrigate the plants, for there is usually insufficient rainfall during the summer months for the needs of the crop.

Soils. The sweet potato grows best on a sandy soil but there are some varieties that thrive well even on fairly heavy types of land. Sandy soils have the advantages of being warmer and better drained than the heavier types. In the lighter soils, too, the potatoes usually mature better and are smoother and cleaner than those on the heavier soil types. Harvesting is easier in the lighter soils and the roots are usually better shaped. If the subsoil is too loose, however, the potatoes will oftentimes grow undesirably long. The sandy soils also have the advantage of being adaptable to irrigation, and under ordinary conditions it is necessary to irrigate sweet potato plants.

Fertilizers. Land of a sandy loam nature should be manured and supplemented by an application of a complete commercial fertilizer applied a few weeks before transplanting the plants. It is desirable to have a good vigorous growth of foliage, but this should not be excessive. In order to have a good yield of tubers, however, the top growth must also be good.

A commercial fertilizer may consist of 200 pounds of nitrate of soda or sulfate of ammonia, 500 pounds of superphosphate, and 300 to 400 pounds of sulfate of potash per acre. For a comparatively small number of plants set out for home use in the farm garden, a ring of this complete fertilizer around the plants at the time of transplanting would be useful. Any manure which is applied should be well rotted and thoroughly mixed with the soil in the spring.

Varieties. Probably the best all around variety for general planting is Nancy Hall. This variety has given good yields when grown on the sandy loam soil of the Station grounds and is also fairly well adapted to the heavier types of soil. It has a high quality and is a productive variety of fairly early season. There are more plants of this variety set out than any other in the Northwest, largely because of the earliness with which this variety produces tubers, its productiveness and sweet flavor when cooked. The potatoes when mature have a yellow skin tinged with pink. A desirable type of the Nancy Hall variety is a tuber which is approximately $2\frac{1}{2}$ to 3 inches wide by 5 to 7 inches long. The flesh is pink when raw, becoming a golden yellow when cooked. In eastern Oregon the Triumph has also been productive. It is light yellow inside and out, produces a heavy yield, and is one of the driest potatoes grown. Its quality, however, is inferior to Nancy Hall.

Plants and plant growing. Commercial growers of sweet potatoes ordinarily produce their own plants, but it is probable that in Oregon where they are not grown extensively the average individual will purchase his plants. If that is the case, these plants will come to him about 6 inches long with several roots attached. They usually cost about \$7 per 1000 or \$1.00 per 100. On arrival it is advisable to keep the roots of these plants from drying out by heeling them into moist soil in a cool place, but the tops should be kept dry, otherwise the leaves and stems may decay. It is desirable to set out the plants as soon as possible after they have arrived, but if they are wilted on arrival they must be put into moist soil so as to become turgid or filled with water before transplanting.

If plants are to be grown at home, a bed heated by manure or hot air passing through tile should be provided. Extension circulars 274 and 275 discuss in detail the making of these two types of hotbeds.

After 12 inches or so of manure has been placed in the pit, it is covered with 3 or 4 inches of sandy soil. On this soil the sweet potatoes are placed approximately one-half inch apart and covered to a depth of two or three inches. The time for starting these plants should be about $4\frac{1}{2}$ to 5 weeks before the anticipated time of transplanting the plants in the field, which in western Oregon is usually about the last part of May or after the last of the spring frosts. Consequently the plants should be started during the middle of April or thereabouts.

A few days before transplanting to the field the plants should be gradually checked by providing cooler temperatures and allowing little or no water to the plants. A few hours before transplanting, however, the plants should be well soaked so as to be turgid at the time of lifting.

Plants are usually set at distances of 16 inches in the row and $3\frac{1}{2}$ feet between the rows or about 9000 hills per acre. If the plants have a number of leaves they should be cut back to two or three leaves. Unless the soil is quite moist it is advisable to irrigate following transplanting. To provide further protection of the plants from cold winds or warm sunlight, a shingle may be placed on the southwest side of the plant. This should be allowed to remain until the plant has become established.

Cultivation. The main object of cultivation of sweet potatoes is to control weeds, for the lighter sandy soils will of themselves form a natural dust mulch. The cultivation should for the most part be shallow and should not disturb the root system of the plant.

Irrigation. Besides watering the plants at setting time, it is advisable to apply water at certain intervals during the growing season. After the vine growth is well established and the tubers begin to form, however, water should be applied in less amounts and later on entirely discontinued, particularly toward the beginning of the first fall rains.

Harvesting. The potatoes should be dug before the vines are thoroughly frozen. The potatoes themselves are not killed by a light frost but digging should take place promptly after the first fall frost so as to get the vines cut away to prevent the frozen sap from entering the tubers. If possible, the tubers should be dug on a dry day, and can be harvested readily by using a spading fork. The work should be carefully done, however, so as to avoid cuts, bruises and abrasions, which later on oftentimes result in rots and molds.

Yields. The best hills of "sweets" in the plantings at Corvallis averaged $2\frac{1}{2}$ pounds per hill. Largest tubers of desirable shape weighed $1\frac{1}{2}$ pounds, and 300 bushels per acre are frequently obtained.

Storage. Following the digging of the potatoes in the field, they should be carefully handled and placed in the storage house at a temperature varying from 80 to 85 degrees F. for possibly 10 to 14 days. This will have a tendency to dry out the excess moisture of the potatoes and provide a suberization which will result in a drier, more solid skin of the tuber, inducing a longer storage period when the potatoes are later kept at a temperature of 55 degrees F. During the first ten to fourteen days of storage at the higher temperatures mentioned, ventilation should be provided so as to carry off the excess humidity of the air.

Quality of sweet potatoes. During active growth of the vine and root through the summer and early fall season, the sweet potato root has a low sugar content, the materials being deposited almost wholly as starch. After harvest there occurs a rapid change of starch to sugar, the rapidity of change varying with the temperature at which the roots are stored. The changes in the equality of the sweet potato during storage, especially the decrease in starch and the increase in sugar, account for the difference in taste and quality between comparatively freshly dug potatoes and those that have been stored for awhile. According to experimental data, potatoes dug October 20 had twice as high a sugar content by December 6, the changes taking place at temperatures as low as 40 degrees F. up to as high as 86 degrees F., but the best storage temperature after "sweating" is 55 degrees F.

The moisture content is more or less constant during storage, the variation between sweet potatoes in this respect being more of a varietal character than a matter of storage.

Insects and diseases. During the early growth of the plants they may be affected by the twelve-spotted bean beetle which will eat holes in the leaves. To prevent injury the plants may be dusted with the complete or all-in-one garden dust or may be repelled by a dust of nicotine sulfate. The most serious injury to the crop, however, often occurs before or during harvesting time when moles and gophers sometimes do serious damage. Whenever these begin to appear in the sweet potato area, immediate steps must be taken to control them.

Diseases, mostly in the form of soft rots, usually come from mechanical injuries and careless handling in digging and hauling to the storage place. It is desirable, therefore, to have the tubers as well matured as possible before digging and thereafter to be as careful as possible in the operations connected with harvesting and handling in the storage house.

Additional information on sweet potatoes:

Sweet Potato Growing, Farmers' Bulletin 999, U.S.D.A., Washington, D. C.

Storage of Sweet Potatoes, Farmers' Bulletin 1442, U.S.D.A., Washington, D. C.

Growing Plants in Flue-Heated Hotbeds, Oregon State Agricultural College Extension Service Circular 274.

Growing Plants in Manure-Heated Hotbeds, Oregon State Agricultural College Extension Service Circular 275.