

Sugar Beet Seed Growing in the Pacific Northwest¹

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The development of the sugar beet seed industry in this country has been mainly by the method of overwintering in the field. This involves selection of locations with suitable climatic conditions to insure reproduction. Studies by Owen and other (1)³ have shown that a winter temperature of 35° to 45° F. for 2 or 3 months, thus holding the beets semi-dormant, is desirable to insure complete reproduction. Inadequate thermal induction of flowering tends toward elimination of those types that are low in bolting tendency and thus develops faster bolting varieties. Parts of the Pacific Northwest have winter temperatures within this favorable range, and beets may be overwintered in the field without danger of winter killing from freezing (figure 1.)

Along with a suitable climate, there must be soils adapted to the crop. The stream bottom soils such as those, of the Medford series in southern Oregon, Chehalis, Newberg, and Hillsboro in the Willamette Valley, Puget in western Washington, and several others less well known, are adapted for sugar beet seed culture. All these soils have their specific nutritional problems. Many western Oregon soils have a deficiency of sulphur. Heavy winter rains have caused considerable leaching, causing is some areas deficiencies of nitrogen, calcium, boron, and other nutrients, and resulting in unfavorable soil acidity. Phosphorus and potash are not abundant but appear to be sufficient for present needs on most of the river bottom soils in Oregon. Some soils of western Washington have a pronounced phosphorus deficiency.

In the Willamette Valley beets sometimes fail in the seedling stage because of shortage of sulphur. Heavy nitrogen fertilization in the spring without adequate sulphur may result in sulphur deficiency symptoms later. Such deficiency may be reflected in extreme chlorosis, deformity of heads, susceptibility to disease, general low yield, and poorer quality seed. Gypsum applications (100 to 200 pounds per acre) broadcast prior to planting will take care of the seedling stage. Where a considerable quantity of commercial nitrogen is used in the spring, at least one-third of it should be in the sulphate form in order to maintain sulphur supply.

¹Experimental work done in cooperation with the Oregon Agricultural Experiment Station, Corvallis, Ore.

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³Italic numbers in parentheses refer to literature cited.

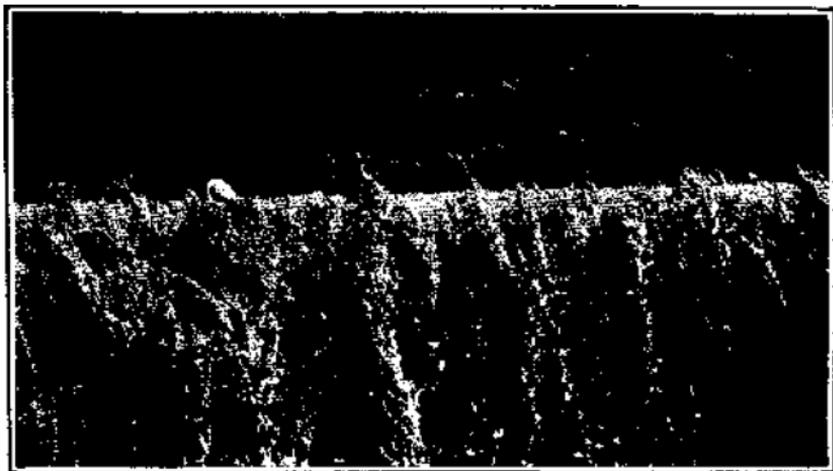


Figure 1.—The sugar beet variety, Improved S. 15, as grown for seed at Gold Hill, Ore. Photographed June 18, 1943, on the farm of Otto Bohnert.

Boron deficiency is readily corrected by the application of 25 to 30 pounds of borax per acre. This should be a general practice on all Willamette Valley soils because without added boron serious malnutrition may develop. This malnutrition takes the form of heart rot and winter killing or may result in terminal shoot deformation in the seed stalk phase.

Soils of western Oregon have for the most part been under cultivation for many years and with insufficient effort being made to maintain the original natural fertility. Organic matter has become depleted, plow soles have developed, soil structure has suffered, and nutrients have been lost. Low yields have resulted. However, 3,000 to 5,000 pounds per acre of high quality seed grown in some places indicate the potential capabilities of the area. The sugar beet crop under good conditions makes a large amount of vegetative growth, and heavy fertilizing with commercial nitrogen is necessary. From 100 to 200 pounds of nitrogen per acre are usually required. A small portion of this should be applied in the fall, but the major portion should be side-dressed in the spring. Where irrigation is practiced, a small amount, preferably in nitrate form, applied through the irrigation water will be highly beneficial. Fall treatments should be in the sulphate form to prevent loss by leaching, but for spring side-dressings best results have been obtained with a mixture of ammonium sulphate and sodium, ammonium, or calcium nitrate.

In the overwintering method of production practiced here, seed is planted at rates ranging from 10 to 15 pounds per acre in rows

spaced 20 to 28 inches and left unthinned. A few fields have been cross blocked under non-irrigated conditions to provide hills at 24 inches by 24 inches spacing. Yields under this method have been comparable to continuous planting with similar soil conditions. Where this is contemplated the grower should strive for a stand of 6 to 8 plants per hill. Investigations with stand variations have not shown any marked yield differences over a moderate stand range.

Considerable latitude in planting season is possible, although the main part of the crop in this area has been planted in the fall. In southern Oregon plantings have been in the fall following pre-irrigation, but in the Willamette Valley plantings from June 1 to the middle of August have been about uniformly successful. Plantings up to the middle of June can usually utilize spring moisture for germination, and yields up to a ton of seed per acre may be grown without irrigation. Plantings later than this will usually require irrigation for germination. Plantings earlier than June 1 may suffer considerably from leaf spot diseases or winter killing. Plantings later than the middle of August may not attain sufficient root growth for satisfactory seed yields. Supplemental irrigation during the period of greatest vegetative growth is profitable.

The weed problem requires special attention because the relatively mild winter temperature of this area is favorable for weed growth. Crop sequence should be planned so as to contribute to weed control. Beets should not follow a spring grain. Late August plantings may not make sufficient growth to hold weeds in check. Cultivation as late in the fall and as early in the spring as the condition of the soil will permit will aid materially in weed control. Where good farming is practiced the weed problem is negligible.

Harvesting in this area usually starts about the latter part of July or the early part of August. This has been handled most satisfactorily by swathing with a special cutter, after which threshing can be done with an ordinary combine. If more capacity is desired, large stationary threshing machines have been remodeled, provided with pick-up attachments and suitable running gear so as to be satisfactory for this work.

About 2,000 acres of sugar beet seed were produced in the Pacific Northwest in 1941, but some decline was experienced during the war. With an expected resumption of normal beet sugar production and with better cultural programs established, this crop should have an expanding place in sound rotation practices for this area.

Literature Cited

1. Owen, F. V., Carsner, Eubanks, and Stout, Myron. Photothermal Induction of Flowering in Sugar Beets. Jour. of Agr. Res. 61: 101-124. 1940.