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GROWING SNAP BEANS FOR FRESH MARKETING AND CANNING

By

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The word "snap" as applied to beans is based on the development of the pods in that they will snap or break readily when harvested. There are commonly three stages of development in beans -- snap, green shell and dry. The word "string" bean, widely used to indicate the "snap" stage, is erroneous and should rightly be "stringless."

Importance of the Crop.

Snap beans are grown widely for fresh marketing and for canning. In 1931 it was estimated that there were in the United States, 114,000 acres of snap beans grown for fresh marketing, as opposed to 54,000 acres for manufacture. In Oregon beans are grown quite widely for canning purposes. In 1927 it was estimated that there were 650 acres planted for canning and the total pack was 65,303 cases. In 1930 approximately 880 acres were planted with a pack of 225,000 cases. In 1931, however, the acreage had been reduced to 400 acres with a total production of 125,000 cases. For the years 1928 to 1931, inclusive, Oregon is credited, according to the United States Department of Agriculture statistics, with an average of 715 acres of beans planted for manufacture. During this period, the yields per acre have varied from three to four tons with values varying from fifty-eight to sixty-five dollars per ton. In 1931 Oregon led all states growing beans for manufacture in point of tonnage per acre. The average of the United States for the years 1928 to 1931 was 1.34 tons per acre.

Varieties.

A variety of beans suitable for canning should have certain definite characters; first, it should be prolific in yield of pods so as to make it profitable to the grower in tonnage; second, it should be of the correct shape, color, and size in order to satisfy the trade; third, the edible quality should be good; and, fourth, the variety should have a normal tendency toward stringlessness. This character, however, is oftentimes a matter of the strain of the variety as well as the variety itself.

Of the tall growing or pole varieties, the Kentucky Wonder is largely grown. It is a hardy, vigorous grower and a prolific producer. The pods are medium dark green and quite long, often reaching nine or ten inches, slender, curved, twisted, nearly round, and very crisp when young. The beans will stay longer in the snap stage than many other pole varieties, and the flavor is excellent. Due to the climbing habit of the variety and the length of the beans, the pods are easily harvested. Another widely grown pole variety also having green pods is Blue Lake. It is widely grown for canning purposes. The Blue Lake is a hardy grower and a good producer, often yielding more heavily than

the Kentucky Wonder. When picked in the proper condition the pods have excellent quality but they develop stringiness more quickly than the Kentucky Wonder. Valuable varieties in the striped or mottled class are Oregon Giant and Delicious Giant. Both of these are pole varieties and produce large pods in prolific quantities. Of the bush varieties, the most widely grown include Stringless Refugee, a very productive bean, nearly round and cylindrical but often having a rather undesirably light color. Its chief value is in its freedom from strings, but being a bush bean it is more laborious to pick. The pods stay in a good condition for a long time. Stringless Green Pod is also widely grown. It is inclined to be slightly flatter than the Refugee, but is unusually reliable, productive, and has excellent quality. The color is a good medium dark green. Another valuable variety is Full Measure, a bush bean with tender green pods.

Wax or yellow varieties can be grown in either the bush or pole class, a desirable wax bush bean being the Pencil Pod Black Wax, and a useful pole variety of wax bean is the Kentucky Wonder Wax.

### Soils for Beans.

Land for growing snap beans should be well drained, warm, moderately fertile, easy to work, and able to retain moisture well or else be adaptable for irrigation. Any land that is naturally fertile or has been built up to a good state of fertility will grow good yields of beans. Sandy loam and silt loam soils are preferred, and in some cases beans are grown satisfactorily and with excellent yields on organic soils that are well drained. The latter hold moisture well during the summer time while the lighter lands must be irrigated in order that the plants produce heavily. Soils that have been used for bean growing for a number of years do not continue to bear heavy yields unless the organic content of the soil is renewed and additional fertilizer is added. Impoverished soils can be detected by the meagre growth of vines and smaller yield of pods.

### Fertilizers.

Rotted manure or cover crops are the best fertilizers for adding organic matter to bean ground. It has been definitely observed that two factors which may limit the growth of bean plants and diminish yields are, first, lack of organic matter in the soil and, secondly, too low a nitrogen content of the soil. Where manure cannot be obtained, there should be a definite program of building up the organic matter with a rotation of cover crops; or a cover crop should be sown late in the summer in between the bean rows and turned under the following spring. If that is done, it is necessary that there be a nitrogen fertilizer applied in the spring to take care of the nitrogen supply while the cover crop is rotting.

At the present time commercial fertilizers are being widely used in growing beans for canning purposes. An analysis of a fertilizer commonly used is 3-10-7, and usually one application of this fertilizer is made; namely, in the furrow at seed sowing, or disked in previous to seeding. It is quite possible that a fertilizer as low as three per cent of nitrogen is insufficient for the needs of a heavy bean crop unless there are successive applications of fertilizers made during the season, or manure has been applied from time to time. It does not appear feasible that one application of fertilizer should be sufficient for a crop which is harvested over a considerable period of time, and it is probable that successive applications of fertilizers which run high in nitrogen and

phosphorus would be productive of heavier yields than a single application at the beginning of the growing season. With water available, the fertilizer applied should produce with maximum efficiency. It is quite possible that the potash now being supplied in a complete fertilizer may not be necessary or add to the productiveness of the land. This matter, of course, can be ascertained only by a definite test of various fertilizers on a uniform piece of land.

Further details concerning commercial fertilizers can be obtained by reading the circular on fertilizers for vegetable crops.

### Seed and Seeding.

The yield and quality of any variety of beans is very largely dependent on the strain of seed, for the variety itself is no better than the strain. The seed should come from a field which has been thoroughly rogued for off-type plants producing pods of an undesirable type. Flat pods are particularly undesirable for the canner. It is especially desirable, also, that the seed be free from mosaic, which is seed borne.

Bush beans are grown in continuous rows and the field is seeded with a hand seeder, using approximately 60 pounds per acre. The distance between rows is usually 28 to 30 inches. The seed should not be sown too thickly as the pods will be fewer and smaller if the plants are crowded. Pole beans are grown either in continuous rows or in checks. If in checks the field can be cross-checked with the hills every three feet and the rows four feet apart. In these distances there will be about 3600 to 3700 hills per acre. For this method of seeding about 20 pounds of seed is usually sufficient, while 30 pounds is used for the continuous row method, in which the plants stand from 12 to 16 inches apart in the row. The time of seeding varies from early May to the middle of June, depending upon when a certain area of beans is desired to come into a state of development for harvesting. Sometimes plantings which are delayed until the second week in June may miss hot weather during blossoming time. Ordinarily a period of from 72 to 75 days elapses between seeding and the first harvesting, but this is variable according to weather conditions and variety. For the home or market garden plantings should be made successively up to early July.

### Thinning and Training.

There will be no thinning in growing bush beans but plants of the pole varieties are sometimes thinned, depending upon the method of growing the crop. If the plants are grown in hills they are usually thinned to three plants per hill. The plants persist in growing anti-clockwise. Various means of training and staking are used. In one case poles 5 to 8 feet long are set in rows 4 feet apart and extending north and south, the poles being 3 feet apart in the rows and slanting slightly toward the north. Set in this way the vines climb better and the pods are straighter and more easily picked. Another plan is to plant the seed in continuous rows so that there will be one plant to every 12 to 16 inches. Posts are set 5 to 7 feet high firmly at the end of the rows and stakes are driven made up of 2 x 2 inch lumber at intervals about 16 feet along the rows. No. 10 or 12 wire is stretched along the bottom about 6 inches from the ground. Between the wires twine is stretched, up which the plants will run until they reach the top wire where they will take care of themselves. Another was is to omit the bottom wire and stick small stakes six inches into the soil and fasten to the top wire.

Some growers use edgings, in which case one is set between each two hills. Stakes are sharpened at one end and driven into the ground about 8 inches and standing about 5 to 6 feet tall. The vines are trained when the runners are about a foot or two in length, being cut on the corners of the stakes with a broad knife blade to hold them. Training is not a hard job as most of the vines climb the stakes. Another grower uses posts, as previously mentioned, having two wires, the lowest one 18 inches from the ground and the top one 5 feet from the ground; then twine is tied at the top wire coming down to the bottom wire at each hill. Three-ply string is used.

#### Maintenance of the Bean Area.

There are four important things in caring for an area of land planted to snap beans. These include cultivation, irrigation, soil fertilization, and insect control.

Cultivation is associated with irrigation and is designed to keep the soil in proper tilth during the growing season. Cultivation is also necessary for weed control. However, if there is no irrigation and no rain falling during the season, no more cultivation should be practiced other than to control weeds.

Irrigated bean fields yield considerably heavier than unirrigated, as attested by numerous experiments in different parts of the state. Not only is the total yield of beans considerably larger but the quality and grade of the crop as a whole are decidedly superior in an irrigated area. It is especially important that the soil be well supplied with moisture during the peak of the blossoming season for this may be important in preventing the young beans from shriveling. In cooler weather blossoms and pods develop normally contrasted with serious withering which may occur during high temperatures.

Bean fields are usually irrigated once each seven to ten days, depending upon the type of soil. While there are some fields irrigated by the overhead system, most pole beans are watered by the gravity or furrow method. Bush beans are usually watered by the gravity system.

In view of the possibility of watering during the summer, it may be advisable to make supplemental applications of commercial fertilizer in addition to the application made at seeding time. If this is done, 200 pounds of so of sulfate of ammonia or nitrate of soda with possibly and equal amount of superphosphate should be supplied on one side of the row and cultivated in.

There are two injurious insects that do considerable damage to snap beans; first, the twelve-spotted beetle which in the spring is very liable to do much injury by eating off the tender leaves of the young plants soon after they come through the ground. Later on these insects eat the leaves and pods of the plants. The pod injury is sometimes quite serious as a large percentage of the pods may have small holes eaten in them, thus rendering them unfit for fresh marketing or canning. When the bean plants are quite small the beetles may be repelled by using a nicotine sulfate dust or a hydrated lime dust. Pyrethrum sprays will kill the beetles by contact when they become numerous later in the season.

Black aphid are sometimes very injurious, particularly with pole beans, but can be controlled by using the black leaf 40 spray in the late spring, particularly with a view of preventing an early infestation of the plants by the

lice. During warm weather a nicotine sulfate dust will control this pest, especially if applied to the plants before the lice have become very numerous.

### Harvesting and Yields.

It is most important to pick beans before they become too large or the seed has started to swell inside the pods. The quality of any variety is very largely dependent upon the time of picking and the development of the pods. Some varieties remain longer on the vine than others without developing toughness. Varieties such as Blue Lake, must be watched closely in order to have them harvested at the proper time. This feature concerning the development of the pods and the quality of the same can best be observed by noting the difference in grade of beans from various sources. Some growers, by very careful attention to the time of harvesting, reduce the percentage of lower grades of beans to a very small amount. Clean and thorough picking of all pods ready to be harvested is essential. In a well picked field there will not be more than ten per cent culls.

Yields vary largely according to the variety, kind of soil, possibility of irrigation, and the amount of ground planted. Small areas with good attention usually bear a heavier yield than larger fields that are not so intensively cultivated and cared for. The bush varieties are not so heavily yielding as the pole sorts. Such varieties as Refugee and Stringless Green Pod ordinarily bear from one to three tons per acre, while the Kentucky Wonder and Blue Lake produce from three to seven tons per acre, depending on the availability of water for irrigation and the fertility of the soil. An average for these varieties is from three to four tons per acre.

In a crop of pole beans the per cent of No. 1 grade may vary from 8 to 18 with a possible average of 12 to 15%, the second grade varying from 53 to 59% with an average of 57%, and the third grade 21 to 32% or an average of 27%. These percentages will, of course, vary considerably with the season, type of grower, and the variety. However, they represent actual figures of growers of an association in the state.

### Costs.

Pole beans will usually entail an expenditure of \$100 per acre before picking. Picking costs formerly were priced at 1¢ per lb. but are lower at the present time. An acre of pole beans grown and picked will show costs of between \$175.00 and \$250.00.

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