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Bush Bean Spacing Causes Little Change in Yield

What Are They? . . . Dwarf Blue Lakes?

Continued backcrossing of Blue Lake pole beans to determinate-bush-selections and the unusual growth habit of these selections has resulted in the question of a proper name which might be assigned to them.

The term dwarf for beans of determinate growth is nothing new. Perhaps Blue Lake Dwarf might be the best terminology for the Oregon State College lines of beans to distinguish them from usual bush types, as well as from Blue Lake pole. Blue Lake no longer applies, of course, to one variety but a number of varieties of pole beans. Their pod characters, especially, are unique enough to place them in one class and to merit the name Blue Lake.

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In This Issue . . .

No significant differences in yield were obtained from spacings of 6, 9, 12, and 15 plants per foot of Puregold Wax bush beans mechanically harvested in an Oregon State College test in 1958.

Previously weighed lots of seed were planted by hand on May 10 in rows spaced 38 inches apart and received uniform fertilizer and irrigation treatments. Stand counts indicated the plant numbers were slightly higher than calculated spacings listed above. Three groups of plots included the four spacing treatments; one group of plots was harvested on July 16, the second on July 18, and the third on July 19. Yields are the result of a single "once-over" harvest with a Chisholm-Ryder bush bean harvester.

In Table 1, data are presented on yield with estimates of returns after seed and picking costs have been deducted. There were no significant differences in yield (average of three harvest dates) at the different spacings although there was slight increase at the higher plant populations. Only limited grade data were obtained and no definite trends were evident.

Yields at the three harvest dates (all spacings included) were 2.64 tons per acre for the first harvest, 3.24 tons for the second, and 3.57 tons for the third.

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Bush Bean Spacing . . . (Continued from page 1)

Efficiency of the harvester appeared to be slightly greater at the 12 and 15 plants per foot spacings than at the 6 and 9 plant spacings at the second harvest. There was no difference in efficiency at different spacings at the third harvest date. No data on efficiency were collected at the first harvest. At the second and third harvests approximately 71% of beans were harvested and transferred to receiving containers; 21% of beans were harvested from plants but were dropped or thrown on the ground, and only 8% of pods remained on the plants.

Information on varietal response to mechanical harvest was presented in Oregon Vegetable Digest, Vol. VII, No. 4, September, 1958.

John Atkin of the Geneva, New York Agricultural Experiment Station reported on spacing studies and mechanical harvest tests in Farm Research, January, 1957. It appeared that in New York a closer spacing of 1 1/2 to 2 inches between plants produced plants better adapted to mechanical harvesting. He noted plants with single upright stalks with very few branches, few low branches, and a greater height of the first node from ground on the closer spaced plants. No detailed observations on Puregold Wax were made in our study at Corvallis, although this variety produced more branches than some of the other varieties tested, and picking efficiency was not as great. With the spacings used, however, there were no marked differences in efficiency of harvest.

On the basis of results from this one-year test on a single variety it would appear that spacings of 6 to 8 plants per foot of row should be adequate for good yields. However, spacings of less than 6 plants per foot were not included in this study.

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Table 1

Spacing of Puregold Wax Bush Beans--Mechanical Harvest
Corvallis, 1958

Spacing plants per foot	Yield tons per acre	Approximate pounds seed per acre	Gross returns per acre	Cost of seed per acre	Picking cost per acre	Return per acre (less seed and picking cost)
6	2.91	75	$291	$30	$58	$203
9	3.04	115	304	46	61	197
12	3.35	150	335	60	67	208
15	3.30	190	330	76	76	178

Arbitrary values: $100 per ton for beans, $20 per ton for picking costs, 40¢ per pound for seed.

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"Dwarfs". . . (Continued from page 1)

Continued insertion of inheritance units (genes) from Blue Lake by repeated crossing probably makes the OSC determinate lines eligible for the terminology Blue Lake Dwarf. Possibly only those determinates with pod refinement and flavor which makes them indistinguishable from pods of Blue Lake pole beans could be so named legitimately.

"What's in a name" is an age-old question. Ultimate and continued success of processed snap beans, whatever the variety name or area of origin, will depend primarily on consistently high product quality. Climatic heritage of this area, along with excellent field culture and processing techniques, should not be underestimated in this "quality" picture.

What is the present status of the OSC Blue-Lake-derived dwarfs?

1. Continued crossing to Blue Lake has been maintained. Selections from backcross 7 have been made. Initial increases of a few backcross 6 lines have been made on the OSC vegetable research farm. Seed increases of backcross 3 to backcross 5 are being made by seedsmen. Three small pilot tests in growers' fields will be made this season; several will be made in 1961. In 1962 more seed will be available--of newer lines which should even more closely approach Blue Lake pod quality. Some of the first lines to be increased have been consistently judged by industry quality controlmen and fieldmen as closely approaching Blue Lake pod quality in flavor, color, texture, and appearance.

2. Plants of these new beans are slightly floppy.

3. The harvester will harvest these beans fairly well. Tenderness is conducive to breakage, but this may be partly overcome by new harvester improvements.

4. Harvest time of first OSC releases must be carefully watched. Pods tend to be smaller in diameter than Blue Lake, and unless harvested at the proper time they will quickly become thin walled and pithy.

5. Yields in Oregon have been relatively good. A range of 3 to 5 tons per acre is to be expected.

6. Yields of small test plots in Midwest and East have been low, and pod set has not been concentrated in these areas.

7. Maturity in Oregon appears to be within two or three days of Tendercrop. Midwest and East maturity is reportedly two to three weeks later.

8. We have yet to determine how these lines will perform in larger acreages, nor do we know possible disease build-up over short or long range.

9. Processing plant problems have yet to be clarified. Cleaning and declustering appear highly desirable, and pod breakage effects need further study. Pods may require relatively fast handling and processing after harvest.

10. Because pods are concentrated on determinate plants a definite tendency exists for occurrence of more crooked pods because of growth against stems and leaves. Degree of impact on vertical pack whole pods is not known.

11. Degree to which growth habit may be altered by cultural practices--spacing and fertilization--will require further study.

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1960 Insect Control Handbook Ready in April

The 1960 Oregon Insect Control Handbook comes off the press in early April and can be purchased for $2 postpaid at the OSC Co-op Book Store, Oregon State College, Corvallis, Oregon.

The vegetable section of the handbook has been completely revised to include all crops which may be processed or sold interstate on the fresh market. This section includes names and a brief description of common vegetable pests found in Oregon. Insecticides registered for use on each crop, together with dosage, tolerance, time limitation, and other specific restrictions are tabulated by material and crop. For practical purposes, materials which are no longer used or manufactured have been excluded from the list of registered materials.

Some of the insecticides are new and have not been adequately tested against all pests on each crop. These are indicated in the table. If new materials are registered after the handbook is published, the Extension Service will attempt to supply needed information through County Agents.

--H. E. Morrison
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Vegetable Note . . .

Waters and Atkin of the New York (Geneva) station reported in ASHS, Volume 74, 1959, that transverse breakage of cotyledons in bean seeds resulted in "smaller seedlings, few pods, and lower yield per plant." They state that "a revised interpretation of normal seedlings will be needed if official laboratory germination tests are to indicate accurately the potential planting value of snap bean seed."

New Harvesters Noted in Horticultural Meeting

Discussions, reports, and a motion picture, in addition to the reading of several papers, highlighted the 1959 Oregon Horticultural Society meeting last November in Corvallis. (Brief summaries of some of the papers were published in the January issue of Oregon Vegetable Digest.)

Lee Towson of Chisholm-Ryder Company presented an illustrated paper on mechanization of production of vegetable crops, emphasizing new harvesting machines for beans, cucumbers, and tomatoes. He pointed out that two new models of bush bean harvesters were built in 1959, combining adjustment for row width and brushes to reduce pod breakage and "throwing." Improvement in cleaning and declustering equipment is also underway.

A motion picture illustrating importance of proper seedbed preparation and midsummer fumigation for best results in symphylid control was shown by Morrison and Every. Howett of Washington State University stressed the importance of a high concentration of a good fumigant such as methyl bromide over a short period of time. He also considered the possibility of mass migrations of symphylids in the spring of the year.

Manning Becker, in his report on cost of production records compiled in cooperation with growers and county agents, summarized costs by items of expense for bean yards producing relatively good yields:

Items	Cost per acre
Labor	$687-788
Tractor and irrigation	83-129
Fertilizer	30- 50
Dusts and sprays	5- 17
Other supplies	33- 76
Overhead and land charge	42- 70
Totals--	$880-1130

New chemicals being tested for weed control, according to Garvin Crabtree, are as follows:

Zytron--selectively promising on several vegetables; activity somewhat low; possible limited use.

Dacthal-- of some promise for weed control in crucifers.

Karsil--for carrots, and Solan--for tomatoes are still in testing phases.

Amiben--of interest for carrots.

Carbyne--a wild oat herbicide, for possible use in peas.

Atrazine--a systemic akin to simazin, of possible use in sweet corn.

Crabtree also noted that many materials were becoming available in granular forms which are more convenient to apply to the soil.

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Entomologists Consider Vegetable Pest Control

Vegetable pest control was the main concern of entomologists meeting in Portland, Oregon, on January 18-20 for the 19th Annual Pacific Northwest Vegetable Insect Conference. Here are some of the highlights of the meetings:

Slugs. Experiments in Washington state on strawberries demonstrated that metaldehyde dust and spray formulations were superior in slug control to metaldehyde baits. Unfortunately, spray and dust formulations do not have federal registration for use on small fruits and vegetables and until additional research is carried on, cannot be recommended.

Symphylids. The previously recommended parathion soil treatment (5 pounds toxicant per acre) is now limited to such crops as beans, cabbage, cauliflower, carrots, and lettuce. A dosage of 4 pounds toxicant is registered for use on potatoes as a preplanting soil treatment.

Of the soil fumigants, Vapam is registered for use on vegetable crops while registration of ethylene dibromide, D-D Mixture, Telone, and Nemagon is pending. These materials only came under federal registration requirements on March 9, 1960.

Of the newer materials, experimental nematocide, 18,133 (product of American Cyanamid Company) looks promising in both Oregon and Washington. It is an organic phosphate material with residual properties. No chemical residue studies have yet been made and more experimental work is needed before it can be registered for use on food crops.

Insect Resistance. Carrot rust fly continues to be difficult to control in certain areas of Washington. For the first time it was reported that the cabbage maggot has developed a high tolerance for both chlorinated hydrocarbons and organic phosphate insecticides. The onion maggot previously had developed a resistance to the chlorinated hydrocarbon materials, but is now adequately controlled with Trithion, Guthion, Ethion, and Diazinon. Because of phytotoxicity, the granulated formulations of Diazinon are no longer recommended for control of onion maggots.

Residual Soil Insecticides. In Oregon, continued studies with residual soil insecticides show that at dosages of 10 pounds toxicant per acre, aldrin, dieldrin, and heptachlor have given commercial control of the tuber flea beetle 11 years after material was applied. However, there are indications that materials are beginning to lose their effectiveness. At dosages of 2 and 5 pounds toxicant per acre, these materials have continued to give commercial control after seven years, but are beginning to lose their effectiveness.

Of these materials, federal registration on heptachlor was rescinded as a preplanting soil treatment on all vegetables. This was modified February 9, allowing the use of heptachlor up to 3 pounds toxicant per acre on such vegetables as corn, lima beans, tomatoes, and peppers. A tolerance of zero has been established for both heptachlor and heptachlor epoxide.

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