OREGON VEGETABLE Digest



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# Seasonal Behavior of New Bush Beans Studied

## Annual OHS Meeting in Portland

The annual meeting of the Oregon Horticultural Society will be included in the Northwest Agricultural Show in Portland Memorial Coliseum, January 27-29.

"Mechanical Harvesting Progress in the U. S." by A. Lee Towson, Jr., Director of Agricultural Engineering, Chisholm-Ryder Company, Niagara Falls, N. Y., will be one of the highlights of the Thursday morning, January 27, meeting of the Vegetable Section. Also included in the program are a panel discussion on 1971 multi-row bean harvest and reports on close spacing of sweet corn and beets and precision planting and mechanical harvesting of broccoli.

In a joint session of Small Fruits and Vegetables on Friday morning, Dr. Sylvan Wittwer, Director of the Michigan Agricultural Experiment Station, will discuss environmental problems of horticultural crop production and processing.

The vegetable section meetings will be held in the Weyerhaeuser Room of the Coliseum. Gerald Edwards will serve as chairman.

## In This Issue . . .



**Early Season.** The 1604 bush bean line showed promise for high yield when planted early in the spring of 1970. Therefore, it was planted again in 1971 in a well-replicated yield test and compared to Oregon lines 58 (110) and 190 (strain 17).

Comparative data are shown (Table 1) for the three lines, planted April 27. The test was made on the Vegetable Research Farm, in a soil known to be heavily infested with fusarium root rot. Yields of 1604 were again significantly higher than for Oregon 58 and 190.

Sieve size data (Table 1) are typical of the three bush beans. Both 1604 and 190-17 could have been harvested a day or two later, with higher yields and with sieve sizes still satisfactory.

**Table 1. Early season yield test of Oregon bush bean lines 58, 190-17, and 1604 (Corvallis, 1971)[1]**

| Line | Percent beans in sieve sizes | | | | | | Yield (tons per acre) |
|---|---|---|---|---|---|---|---|
| | 1 & 2 | 3 | 4 | 5 | 6 | 7+ | |
| Ore. 1604M | 20.5 | 28.8 | 31.1 | 16.9 | 2.3 | 0.4 | 5.4 |
| Ore. 58-110 | 11.6 | 14.1 | 23.1 | 31.5 | 17.6 | 2.1 | 4.3 |
| 190-17 | 27.1 | 34.8 | 30.1 | 7.1 | 0.9 | 0.0 | 3.9 |
| Tons per acre required for significant difference between varieties, odds 20:1 | | | | | | | 0.6 |

[1] Root rot test area. Planted April 27, harvested July 20, 1971.

A more extensive test plot, planted April 28, included two lines of 58, two lines of 190, four lines of 1604, and 14 new lines. This test plot also was located in a soil area in which root rot had been prevalent. Data are shown in Table 2. Yield and sieve size data for 58, 190, and 1604 are similar to those shown in Table 1. Yield of 1604 was again significantly higher than for 58 and 190. The magnitude of

(*Continued next page*)

# New bush beans . . .

Table 2. Early season test of new bush green pod bean lines (Corvallis, 1971)[1]

| Line | Percent beans in sieve size | | | | | | Yield (tons per acre) |
|---|---|---|---|---|---|---|---|
| | 1-2 | 3 | 4 | 5 | 6 | 7+ | |
| Oregon 17 | 13.9 | 18.2 | 26.7 | 31.4 | 8.5 | 1.3 | 5.9 |
| 58-NZ-2 | 11.4 | 13.1 | 16.0 | 23.5 | 30.0 | 6.0 | 4.5 |
| 58-2742 | 11.6 | 11.9 | 12.4 | 15.0 | 29.5 | 19.6 | 4.0 |
| 190-10 | 29.2 | 35.3 | 24.8 | 7.0 | 2.0 | 1.7 | 3.5 |
| 190-17 | 29.3 | 30.4 | 29.4 | 9.0 | 1.7 | 0.2 | 3.8 |
| 1603 | 18.0 | 22.5 | 32.1 | 21.7 | 5.5 | 0.2 | 5.5 |
| 1604-1 | 18.5 | 22.2 | 27.6 | 23.7 | 4.0 | 0.0 | 5.5 |
| 1604-3 | 22.9 | 26.4 | 26.7 | 18.0 | 5.4 | 0.6 | 5.6 |
| 1604-6 | 21.2 | 23.2 | 29.3 | 19.5 | 6.4 | 0.4 | 5.7 |
| 1604HB | 17.2 | 20.9 | 27.2 | 24.3 | 9.9 | 0.5 | 5.8 |
| 1752-2 | 24.3 | 29.2 | 31.0 | 11.1 | 3.2 | 1.2 | 4.8 |
| 1941 | 12.9 | 15.8 | 24.0 | 28.7 | 16.6 | 2.5 | 5.3 |
| 2066-2 | 13.7 | 16.1 | 27.6 | 27.1 | 13.4 | 2.1 | 5.8 |
| 2217-29 | 15.7 | 17.8 | 25.3 | 30.2 | 9.9 | 1.1 | 5.5 |
| 2224-5 | 24.9 | 23.7 | 27.8 | 17.7 | 5.3 | 0.5 | 5.5 |
| 2240 | 10.0 | 12.0 | 19.5 | 33.1 | 22.9 | 2.5 | 6.3 |
| 2325 | 14.0 | 15.3 | 17.8 | 23.0 | 22.6 | 7.3 | 5.2 |
| 2571 | 15.4 | 18.7 | 25.7 | 27.1 | 11.6 | 1.5 | 5.5 |
| 2591 | 18.5 | 21.1 | 25.8 | 26.5 | 7.4 | 0.7 | 5.6 |
| 2657 | 16.8 | 21.3 | 27.4 | 21.3 | 10.7 | 2.5 | 4.8 |
| 2665 | 11.4 | 17.9 | 32.5 | 28.4 | 7.8 | 2.0 | 6.1 |
| Tons per acre required for significant difference between varieties, odds 20:1 | | | | | | | 0.8 |

[1] Planted April 28, harvested July 20-29. Single harvests, various replicates.

the yield difference did not, however, equal that noted for an early planting in 1970. The 1971 season was characterized by a long period of cool weather followed by periods of prolonged high daytime temperatures in July and August.

Several of the new lines in this test of early planting yielded as well as 1604.

**Midseason.** This planting was made on June 5, and pods were harvested, depending upon maturity of the various lines, on August 6, 9, 11, and 13. Asgrow BBL was included in this test. All varieties produced relatively high yields in this planting, and the advantage of 1604 over 58 and 190 was less pronounced. Sieve size advantage was clearly in favor of 1604 and 190. For the first time in three years of testing, a series of high daytime maximum temperatures contributed to fiber development in some 6 sieve beans in 1604. Fiber also was noted in lines 2660 and 2657, and the texture of 1963-1 was questionable. Thus, pods of these lines, carrying heavy doses of inheritance units from Blue Lake, reacted under heavy stress in a manner rather similar to pole Blue Lake. The determinate habit of the bush bean, accompanied by heavy pod set and concentration and relatively weak root systems, adds to the problem of stress. Selection for vigor, for tolerance to root rot, and for pods inherently low in fiber and at least moderately fleshy requires emphasis in the breeding program. Excellent cultural practices are obviously necessary.

In general, the new series of selection (Table 3) are intermediate between the rather extreme fleshiness and large sieve size of 58 and the small diameter pods of 190.

**Late Season.** Beans were planted for this test on June 28, and most lines were harvested August 24, 26, and 30; one series of plots of BBL 290 were harvested as late as September 13. All plots of Oregon 58 were harvested earlier than usual in order to get a better "reading" for yield of small sieve beans (Table 4). In this case, sieve sizes were roughly similar to those of 1604; the yield advantage was again in favor of 1604. Most of the new lines yielded well. The 190-17 sub-line was slightly earlier and fleshier in this test than sister line 190-10.

Observation of pods of a given line of beans maturing at different times in summer and fall clearly indicates the impact of environment on pod characteristics. For example, pods of Oregon 58 have typically been better filled and less irregular in late plantings; in 1971 pods of 1604 were much smoother in the early planting than in later plantings.

Differential behavior for yield can also be expected. The 58 and 190 beans have yielded best in relatively late plantings. The 1604 has been more consistent in yield and pod set throughout the season.

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Table 3. Midseason test of new bush green pod bean lines (Corvallis, 1971)

| Line | Percent beans in sieve size | | | | | | Yield | Harvest dates[2] |
|---|---|---|---|---|---|---|---|---|
| | 1-2 | 3 | 4 | 5 | 6 | 7+ | | |
| | | | | | | | T/A | |
| Oregon 17 | 9.2 | 11.2 | 24.8 | 35.7 | 16.4 | 2.7 | 7.1 | August 6, 9 |
| 58-NZ-2 | 9.6 | 7.2 | 12.4 | 25.0 | 30.5 | 15.3 | 7.4 | August 6, 9 |
| 58-2742 | 9.9 | 8.2 | 13.9 | 25.3 | 29.7 | 13.0 | 7.3 | August 6, 9 |
| 190-10 | 17.0 | 21.7 | 34.5 | 21.4 | 4.8 | 0.6 | 6.6 | August 6, 9 |
| 190-17 | 13.6 | 18.8 | 29.8 | 25.3 | 10.8 | 1.7 | 6.6 | August 6, 9 |
| BBL290 | 16.3 | 27.3 | 34.0 | 15.5 | 6.4 | 0.5 | 5.6 | August 11, 13 |
| Oregon 1603 | 8.9 | 13.7 | 29.5 | 35.1 | 10.8 | 2.0 | 7.1 | August 6, 9 |
| 1604HB | 9.6 | 9.9 | 20.3 | 33.7 | 21.6 | 4.9 | 8.3 | August 6, 9 |
| 1604-1 | 9.6 | 11.7 | 21.9 | 32.0 | 21.0 | 3.8 | 8.3 | August 6, 9 |
| 1604-3 | 11.7 | 11.3 | 22.0 | 33.1 | 19.3 | 2.6 | 7.7 | August 6, 9 |
| 1604-6 | 11.8 | 11.0 | 23.7 | 32.1 | 18.4 | 3.0 | 8.9 | August 6, 9 |
| 1627-1 | 11.5 | 13.8 | 26.3 | 32.0 | 14.6 | 1.8 | 7.5 | August 6, 9 |
| 1752-2 | 12.6 | 15.9 | 28.9 | 30.4 | 10.3 | 1.9 | 6.7 | August 6, 9 |
| 1941 | 11.3 | 8.1 | 16.0 | 32.3 | 24.6 | 7.7 | 7.6 | August 6, 9 |
| 1963-1 | 9.2 | 9.6 | 22.0 | 37.6 | 19.4 | 2.2 | 7.9 | August 6, 9 |
| 2066-2 | 10.3 | 9.9 | 17.6 | 28.9 | 26.2 | 7.1 | 9.4 | August 9, 11 |
| 2217-23 | 11.4 | 12.2 | 22.9 | 28.8 | 21.9 | 2.8 | 7.9 | August 9, 11 |
| 2217-29 | 9.6 | 12.3 | 16.6 | 31.0 | 24.5 | 6.0 | 8.0 | August 6, 9 |
| 2224-5 | 11.0 | 11.7 | 23.9 | 35.0 | 16.0 | 2.4 | 8.6 | August 9, 11 |
| 2240 | 8.9 | 9.4 | 19.2 | 34.7 | 23.8 | 4.0 | 7.4 | August 6, 9 |
| 2325 | 8.9 | 10.7 | 16.4 | 29.6 | 27.4 | 7.0 | 7.3 | August 6, 9 |
| 2571 | 9.3 | 10.7 | 25.0 | 29.5 | 22.1 | 3.4 | 7.7 | August 6, 9 |
| 2591 | 15.4 | 13.8 | 21.5 | 30.4 | 16.1 | 2.8 | 7.6 | August 6, 9 |
| 2657 | 13.1 | 10.3 | 17.1 | 28.4 | 24.3 | 6.8 | 8.5 | August 9, 11 |
| 2660 | 9.7 | 11.4 | 18.9 | 31.6 | 23.9 | 4.5 | 8.3 | August 6, 9 |
| 2665 | 8.5 | 11.1 | 27.5 | 33.7 | 17.5 | 1.7 | 8.4 | August 6, 9 |
| Tons per acre required for significant difference between varieties, odds 20:1 | | | | | | | 1.2 | |

[1] Planted June 5, harvested August 6-11.

[2] Single harvest of various replicates.

Table 4. Late season test of new bush green pod bean lines (Corvallis, 1971)

| Line | Percent beans in sieve sizes | | | | | | Yield | Harvest dates[2] |
|---|---|---|---|---|---|---|---|---|
| | 1-2 | 3 | 4 | 5 | 6 | 7+ | | |
| | | | | | | | T/A | |
| Oregon 17 | 16.6 | 15.0 | 29.3 | 28.4 | 10.7 | 0.0 | 6.2 | August 24, 26 |
| 58-NZ-2 | 21.4 | 21.4 | 21.4 | 28.6 | 7.2 | 0.0 | 5.9 | August 24 only |
| 58-2742 | 16.7 | 22.2 | 22.2 | 27.7 | 8.3 | 2.9 | 5.3 | August 24 only |
| 190-10 | 30.3 | 26.9 | 30.6 | 11.1 | 1.1 | 0.0 | 4.3 | August 24, 26 |
| 190-17 | 17.1 | 19.2 | 33.2 | 27.0 | 3.1 | 0.4 | 5.8 | August 24, 26 |
| BBL290 | 27.5 | 20.5 | 18.2 | 15.9 | 14.7 | 3.2 | 6.9 | August 30, Sept. 13 |
| 1604HB | 20.7 | 19.3 | 26.4 | 27.0 | 6.6 | 0.0 | 7.3 | August 24, 26 |
| 1604-1 | 22.5 | 22.4 | 29.7 | 21.2 | 4.2 | 0.0 | 6.3 | August 24, 26 |
| 1604-3 | 18.5 | 20.3 | 30.9 | 24.5 | 5.5 | 0.3 | 7.2 | August 24, 26 |
| 1604-6 | 26.3 | 21.9 | 28.8 | 19.1 | 3.9 | 0.0 | 6.9 | August 24, 26 |
| 1627-1 | 18.2 | 16.3 | 22.2 | 27.9 | 13.9 | 1.5 | 7.1 | August 26, 30 |
| 1941 | 16.8 | 18.4 | 28.3 | 29.3 | 7.2 | 0.0 | 6.9 | August 24, 26 |
| 1963-1 | 13.8 | 13.7 | 29.4 | 35.6 | 7.5 | 0.0 | 7.1 | August 24, 26 |
| 2066-2 | 19.5 | 18.1 | 21.8 | 26.9 | 12.1 | 1.6 | 7.1 | August 26, 30 |
| 2217-23 | 20.0 | 18.5 | 23.6 | 23.9 | 12.6 | 1.4 | 6.9 | August 26, 30 |
| 2217-29 | 21.6 | 19.6 | 31.0 | 24.9 | 2.5 | 0.4 | 6.0 | August 24, 26 |
| 2224-5 | 20.0 | 15.7 | 26.0 | 25.6 | 10.4 | 2.3 | 7.7 | August 26, 30 |
| 2240 | 13.6 | 13.3 | 26.6 | 36.2 | 9.7 | 0.6 | 7.1 | August 24, 26 |
| 2325 | 29.6 | 22.3 | 27.1 | 18.3 | 2.7 | 0.0 | 5.8 | August 24, 26 |
| 2571 | 16.4 | 17.1 | 29.9 | 29.9 | 6.7 | 0.0 | 6.9 | August 24, 26 |
| 2591 | 23.8 | 19.7 | 29.1 | 21.8 | 5.3 | 0.3 | 6.4 | August 24, 26 |
| 2657 | 17.9 | 15.9 | 25.2 | 27.0 | 12.4 | 1.6 | 7.1 | August 26, 30 |
| 2660 | 14.0 | 16.3 | 32.3 | 29.6 | 7.4 | 0.4 | 7.2 | August 24, 26 |
| 2665 | 18.4 | 20.1 | 33.3 | 24.2 | 3.6 | 0.0 | 6.7 | August 24, 26 |
| Tons per acre required for significant difference between varieties, odds, 20:1 | | | | | | | 1.5 | |

[1] Planted June 28, harvested August 24-26.

[2] Single harvest of various replicates.

# Summer Squash Varieties Observed

Many new $F_1$ hybrid summer squash varieties have been introduced during recent years. Since we have not observed varieties systematically for several years, most of the available hybrids were grown, along with some older varieties, on the Vegetable Research Farm in 1971. Each variety was grown in a 20-foot plot which contained 13 plants, except in a few cases where a few were lost when young. When enough seed was available, a second plot was planted; four varieties were grown in one plot only. Rows were 9 feet apart. About 600 pounds of 8-24-8 banded fertilizer was applied and water was supplied about once a week when needed.

Planting was on May 12. Most of the varieties were producing female flowers heavily on July 5, but no male flowers were open for about two weeks. On July 19 all fruits were removed. The first of eight harvests, done on a Monday-Wednesday-Friday schedule, was made on July 23. All fruits over about one inch in diameter were picked at each harvest. Most of the largest fruits were about 1½ inches in diameter, but a few became somewhat larger, especially those missed for one picking. Yields are presented (see table on next page) as the number of fruits per plant because some of the plots were several plants short of the usual number of 13. Variation in soil or some other factor caused considerable differences between the two plots of some varieties, usually with plot No. 1 yielding more fruit. The yield data must therefore be considered only an indication, which could be erroneous in some cases.

Among the green or zucchini types it is difficult to choose one or two best hybrids. 'Ambassador' and 'Diplomat' had good color and type ratings, but the estimated yields were not high and the latter variety had a number of crooked and constricted fruit.

'Seneca Zucchini' and 'Burpee Hybrid' had very open habit, medium but even color, fair to good type, and good yields. 'Chefini' was fair to good in quality factors, but was low in yield and had a moderately bushy habit. 'Apollo' had fair type, color, and yield, but was somewhat rough. 'Blackjack' was good quality but only fair in yield and tended to curve, while 'Zucco' was very bushy and hard to pick and scored somewhat low in type and color. 'Grezzini,' like the open-pollinated 'Gray Zucchini,' was high in yield but was scored low in color and type; however, it should be tried if fruits which are short, tending to become plump, and light in color are acceptable. Most of the evaluations given here are based on the assumptions that dark green, non-striped, cylindrical, and long fruits would be the most desirable, especially for processing. Open growth habit is considered a distinct advantage because picking is easier. No association between bushy habit and higher yields has ever been observed in our trials; in fact, the opposite sometimes appears to be true.

In the yellow group, 'Seneca Butterbar,' 'Goldbar,' and 'Seneca Prolific Hybrid' are superior processing types. 'Seneca Butterbar' was the best in this trial, but does have some undesirable green color, as do the other two. All of the yellow types have bushy habits. 'Early Summer Crookneck' was conspicuously late in the onset of production and the yield was low.

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## *Vegetable Notes . . .*

Zehni, Saad, and Morgan at the University of Cambridge in England studied the mechanism by which long photoperiods inhibit flower bud development and short photoperiods promote it in a variety of beans, *Phaseolus vulgaris L.*, of Peruvian origin. They found that exposure of the first trifoliate leaf to long photoperiods (16 hours) in plants otherwise given short periods (8 hours) reduced the number of open flowers produced to a figure almost as low as that produced in plants kept entirely in long days. They suggested that there was strong circumstantial evidence that an inhibiting substance is formed in the first trifoliate leaf in long days and is therefore transported acropetally. Exposure of the lowest trifoliate leaf to short days led to the retention of a few of the flower buds, thus providing further evidence that a promoting substance may be formed in the first trifoliate leaf in short days. Work is in progress to examine the substances which inhibit and promote flower bud development. (*Nature*, 227:628-629. 1970.)

Influence of temperature on string formation of beans was studied by Drijfhout at the Institute for Horticultural Plant Breeding, Wageningen, The Netherlands. Eleven bean varieties were grown at 17, 20 and 23° C., after which string strength determinations were made. Varieties were divided into three groups: (1) varieties with a low mean string value, the temperature having only a slight effect on string development; (2) varieties with an incomplete string and mean string value varying from low to rather high, a high temperature having a strong effect on string development; and (3) varieties with a fully developed string and having no temperature effect. No entirely stringless varieties were found. (*Euphytica*, 19:145-151. 1970.)

# Summer squash . . .

## Yield and appearance of summer squash varieties (Corvallis, Oregon, 1971)

| Variety | Source[1] | $F_1$ hybrid | Fruit per plant | | Growth habit[2] | Color score[3] | Type score[3] | Notes |
|---|---|---|---|---|---|---|---|---|
| | | | Plot 1 | Plot 2 | | | | |
| *Green Types* | | | | | | | | |
| Ambassador | 1 | Yes | 13.7 | 12.2 | 1 | 4.0 | 4.5 | Sl. constriction; med. dark green; speckled; smooth, curved. |
| Diplomat | 1 | Yes | 13.4 | 11.2 | 2 | 5.0 | 4.0 | V. dark green; smooth; fairly crooked and bad constriction. |
| Grezzini | 1 | Yes | 18.0 | 15.2 | 3 | 1.0 | 2.0 | Light, striped; smooth; fat and tapered. |
| Gray Zucchini | 4 | No | 18.2 | ..... | 3 | 1.0 | 1.0 | Light; speckled; fat; poor type. |
| Seneca Zucchini | 5 | Yes | 15.2 | 12.2 | 1 | 3.0 | 3.0 | Med. green; speckled; smooth; sl. curve. |
| Chefini | 3 | Yes | 10.2 | ..... | 3 | 3.0 | 3.0 | Med. dark green; even color; smooth. |
| Apollo | 4 | Yes | 17.8 | 13.3 | 2 | 3.0 | 3.5 | Med. green; v. long; bad curve; fair to rough shape. |
| Blackjack | 5 | Yes | 12.8 | ..... | 2 | 5.0 | 4.0 | Dark green; slender; smooth; many curved. |
| Caserta | 6 | No | 16.2 | 13.1 | 1 | 1.0 | 3.0 | Med. light green; striped; smooth; knobby ends. |
| Black Zucchini | 7 | No | 9.1 | 15.0 | 5 | 2.5 | 2.0 | Med. green; fat and short; f. smooth; constricted in middle. |
| Burpee Hybrid | 8 | Yes | 14.2 | 14.5 | 1 | 3.0 | 3.0 | Med. green; fine speckle; sl. curve; sl. short. |
| Zucco | 6 | Yes | 16.8 | 11.0 | 4 | 2.5 | 2.0 | Med. green; curved; smooth sl. short. |
| Cocozelle | 6 | No | 10.7 | 11.6 | 2 | 1.5 | 1.5 | Med. green; strong stripe; long and curved. |
| *Yellow Types* | | | | | | | | |
| Early Summer Crookneck | 7 | No | 7.2 | 9.3 | 5 | 2.5 | 1.0 | Variable; some bad green; rough; very late production. |
| Early Prolific Straightneck | 7 | No | 12.2 | 15.0 | 4 | 3.5 | 2.0 | Sl. green; short and fat; sl. bumpy; generally poor type. |
| Goldbar | 1 | Yes | 12.1 | 11.1 | 4 | 3.5 | 3.0 | Sl. green; smooth; cylindrical shape; good type when young. |
| Goldneck | 3 | Yes | 15.2 | ..... | 4 | 3.0 | 1.0 | Good, even yellow color; sl. bumpy; crookneck shape. |
| Seneca Butterbar | 4 | Yes | 13.5 | 20.5 | 4 | 3.0 | 4.0 | Even color, sl. green; smooth; long and good type; sl. curve. |
| Seneca Prolific Hybrid | 4 | Yes | 13.0 | 12.0 | 4 | 3.0 | 3.0 | Light yellow, some green; f. smooth; taper; fair to good type. |

[1] Sources: (1) Peto; (2) Asgrow; (3) Robson; (4) Harris; (5) Stokes; (6) Ferry Morse; (7) Northrup King; (8) Burpee.
[2] A score of (1) indicates a desirable, open habit; (5) indicates a bushy, undesirable habit which makes harvest difficult.
[3] Type and color scores are subjective and very general with (1) for poor and (5) for good color or type.

# Planters Compared for High Density Beans

No significant difference in yield means of bush beans was obtained when a Stanhay precision seeder and a grain drill were compared in plots of 7-inch row spacings at the North Willamette Experiment Station in 1971. At Corvallis, yields were higher for the Stanhay than for grain drill plantings.

Early Gallatin, Tempo and Oregon 58 varieties were planted in beds of 11, 7-inch rows at North Willamette Experiment Station on May 18. Fertilizer was broadcast prior to final seedbed preparation at a rate of about 100-88-83 pounds N-P-K per acre. Plant populations ranged from 200,000 to 260,000 plants per acre except in one case (Oregon 58 planted with the Stanhay) where population was about 115,000 plants per acre. Populations were higher in grain drill plantings than in the Stanhay plantings. Five-foot plots of each 11-row bed were used for hand harvested yield. Three 50-foot plots of each variety were harvested with the Chisholm-Ryder (Multi-D) high density harvester on August 2.

Yields from high density plantings averaged about 5.8 tons per acre and were about 70% of hand harvested yields. Average yield for the Stanhay planting, machine harvested, was 5.7 tons per acre and was 5.8 tons for the grain drill planting (Table 1). About 62% of pods were sieve size 4 and smaller by weight when grain drill and Stanhay planter means were compared. Sieve size 4 and smaller pods were as follows for varieties: Tempo—64%, Early Gallatin—72%, and Oregon 58—52%.

**Table 1. Effects of grain drill and Stanhay plantings on yields of bush beans (North Willamette Experiment Station, 1971)**

| | Yield (tons per acre) | | | Planter means |
|---|---|---|---|---|
| | Tempo | E. Gallatin | Oregon 58 | |
| *Hand harvest* | | | | |
| Stanhay | 8.6 | 8.9 | 7.7 | 8.4 |
| Grain drill | 8.8 | 8.0 | 8.2 | 8.3 |
| *Machine harvest (Multi-D)* | | | | |
| Stanhay | 5.8 | 5.2 | 6.1 | 5.7 |
| Grain drill | 5.5 | 5.5 | 6.3 | 5.8 |

At the Vegetable Research Farm, Corvallis, the Oregon 58 bush bean variety was planted with the Stanhay precision seeder in 7-inch rows and with a grain drill in 6 ½-inch rows on May 28 and June 4. Plant populations ranged from about 115,000 to 135,000 plants per acre and were slightly higher in grain drill plantings than in Stanhay plantings. Three broadcast fertilizer rates (100-100, 500-500, and 1,000-1,000 pounds P-K per acre—initial rates established and only applied in 1966) were used with a uniform application of 100 pounds nitrogen per acre in 1971. Plots 1/1000 acre in size were hand harvested on August 5 and 10 for the respective plantings.

In Table 2, yields from the Stanhay plantings were significantly higher than from grain drill plantings. However, sizes of 4 sieve and smaller pods were higher from grain drill (38%) than from Stanhay (27%) plantings. There was no significant difference in yield from broadcast fertilizer rates.

**Table 2. Effects of grain drill and Stanhay plantings on yields of Oregon 58 bush beans grown at three rates of broadcast fertilizer (Vegetable Research Farm, 1971)**

| | Yield (tons per acre) | | | Planter means |
|---|---|---|---|---|
| | 100P-100K | 500P-500K | 1,000P-1,000K | |
| *Planting Date 1* | | | | |
| Stanhay | 9.3 | 9.0 | 10.1 | 9.4 |
| Grain drill | 8.7 | 8.5 | 9.0 | 8.7 |
| *Planting Date 2* | | | | |
| Stanhay | 9.2 | 10.2 | 9.7 | 9.7 |
| Grain drill | 7.9 | 8.2 | 7.7 | 8.0 |
| P-K means | 8.8 | 9.0 | 9.1 | |

A comparison was also made between the high density planting, 7-inch rows, with a grain drill and a conventional 30-inch row spacing at NWES. The 30-inch rows received 72-40 pounds N-P per acre banded at planting. Plant populations for Tempo, Early Gallatin, and Oregon 58 were approximately 261,000, 246,000, and 231,000 plants per acre for the high density planting and 122,000, 87,000, and 72,000 plants per acre, respectively, in 30-inch rows.

Yields were about 65% higher for the high density planting than the 30-inch row planting (Table 3). Sieve size 4 and smaller pods in the high density planting for Tempo, Early Gallatin, and Oregon 58 averaged 66, 69, and 53% and were 47, 52, and 25%, respectively, in 30-inch rows.

**Table 3. Effects of method of planting on yields of three bush bean varieties (North Willamette Experiment Station, 1971)**

| Planting method | Yield (tons per acre) | | | Planting method means |
|---|---|---|---|---|
| | Tempo | E. Gallatin | Oregon 58 | |
| High density, 7-inch rows | 5.5 | 5.5 | 6.3 | 5.8 |
| Conventional, 30-inch rows | 4.2 | 2.4 | 3.9 | 3.5 |

The common grain drill appeared to be a satisfactory method of planting in some of these tests as compared to the Stanhay precision seeder, but further testing on a larger scale is necessary. Uniform spacing, depth of planting, and emergence of seedlings is most desirable for uniform growth, maturity, and high yields. Planting methods, fertilizer application, and other cultural practices to achieve these objectives should be goals for optimum production of high density bean plantings.

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