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Documents Section

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Planting Date Affects Snap Bean Development

Vegetable Crops Field Day Set for July 25

Research plots at the OSU Vegetable Research Farm will be viewed and discussed at 1:30 p.m. on Friday, July 25. Major emphasis will be on breeding and cultural work on snap beans, carrots, beets, sweet corn, peas, and broccoli. Onions, tomatoes, cucumbers, and other crops can be observed. Research on vegetable weed control, diseases, and insects also will be explained.

To reach the Vegetable Research Farm, turn off Highway 34 onto Smith Street, about one half mile east of Corvallis; proceed past the Botany and Plant Pathology farm and through the cut. Parking areas will be designated near the field laboratory.

In This Issue . . .

Number of days from planting to emergence varied from 5 to 6 days for late June and early July plantings and from about 12 to 17 days for late April and early May plantings in four years of tests at Corvallis. Number of days from planting to harvest ranged from 64 to 84 days. Heat unit cumulation in degree days (50° F base) ranged from 800 to 1,160. Earliest harvest date was July 11 and the latest was October 6 in these tests.

Dates of bush bean emergence, first bloom, and harvest were recorded on experimental plantings at the OSU Vegetable Research Farm at Corvallis during the 1961, 1963, 1965, and 1968 growing seasons. In 1961 20 plantings were made of OSU 949, beginning April 25 and ending on June 26. OSU 949 and Tendercrop also were included on seven planting dates at approximately two-week intervals beginning on April 27 and ending on July 21. During 1963, OSU 2065 was planted on 20 dates from May 14 to July 16. Tendercrop was planted on 10 dates in 1965 (April 26-July 9) and on 12 dates in 1968 (April 25-July 11). Average air and soil temperatures during the period from planting to emergence and heat unit cumulation from planting to harvest were calculated.

Data in Figure 1 show that at soil temperatures of 55 to 60° F about 11 to 17 days were required for snap beans to emerge, while 5 to 7 days were required at 75 to 80°. The curve in Figure 1 is drawn through points representing the days from planting to emergence for snap beans in cans of soil in water bath temperature tanks in the greenhouse in 1965 and 1968 tests. In the field, days from planting to emergence were recorded and then the average soil temperature at the 4-inch depth under bare ground for that period was calculated. In Figure 2 the days from planting to emergence are

(Continued next page)

Snap Beans . . .

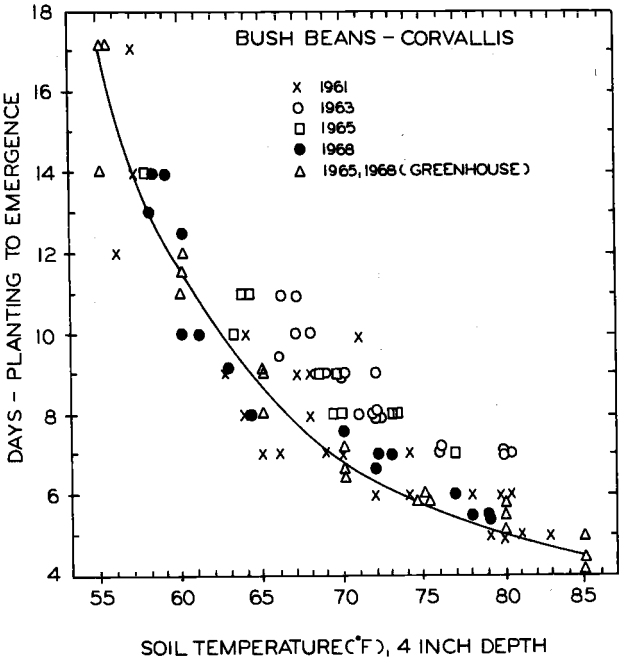

Figure 1. Effect of soil temperatures on bush bean emergence.

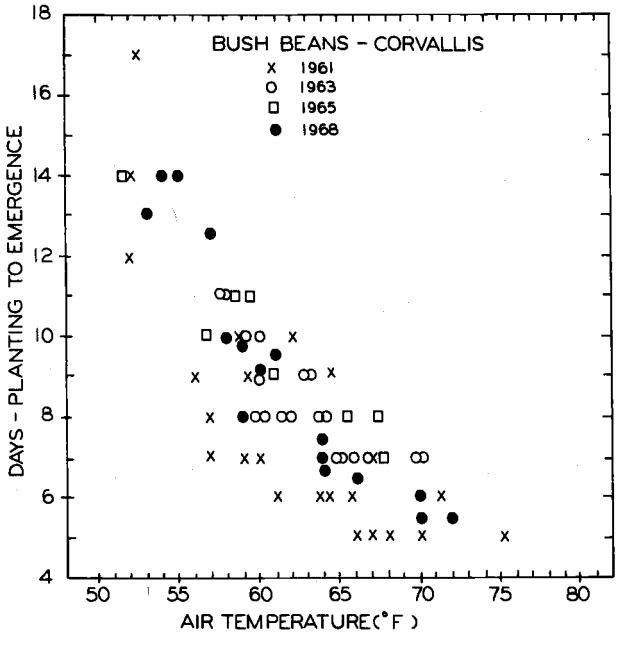

Figure 2. Effect of air temperatures on bush bean emergence.

plotted against the average air temperature (3 feet above ground level, sheltered) for the same period. The pattern is similar to the one in the soil temperature graph, but the air temperatures are about 5 to 10 degrees lower than the soil temperatures.

Monthly averages of air and soil temperatures (4-inch depth) for April through October during 1959-1968 are shown in Figure 3. Some earlier observations on soil temperatures and snap bean emergence were included in *Oregon Vegetable Digest*, Vol. 14, No. 3, July 1965. In the present report some of these data have been revised and expanded.

The number of days from planting to harvest ranged from 64 to 84 (Figure 4). Late April and early May plantings required over 70 days for the development of

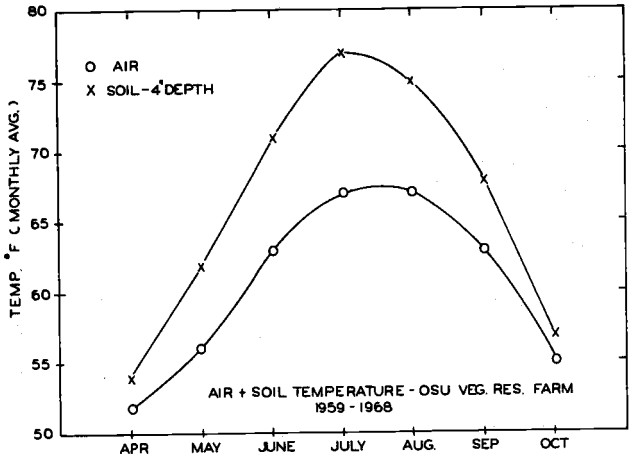

Figure 3. Monthly mean air and soil temperatures OSU Vegetable Research Farm.

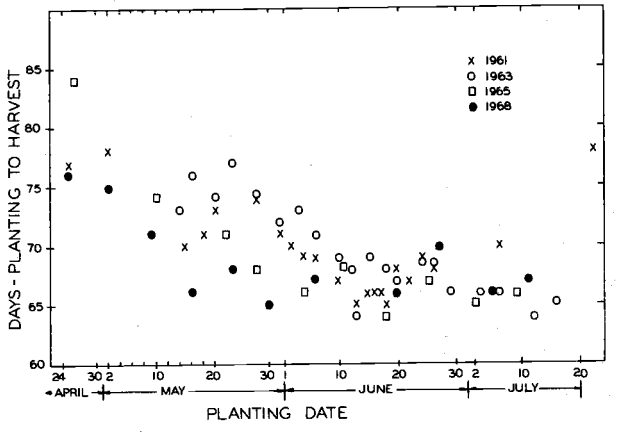

Figure 4. Effect of planting dates on number of days from planting to harvest of bush beans.

the crop, while mid-June and early July plantings took from 64 to 70 days. In these tests only one planting was made after July 15; this planting was on July 21, 1961, and took 78 days from planting to harvest. Days from planting to harvest in 1961 varied from 65 to 78, while days from emergence to harvest ranged from 60 to 65.

In 1963, days from planting to harvest varied from 64 to 77, days from planting to first bloom ranged from 39 to 48, and days from first bloom to harvest were 22 to 31. On the average the number of days from first bloom to harvest has been 20 to 25.

Heat unit cumulation varied from 800 to 1,160 degree days (Figure 5). These were calculated by subtracting a 50° F base temperature from the daily average of minimum and maximum air temperatures and totaling these for the planting to harvest period. During the four years, plantings made prior to May 20 were ready for harvest before accumulating 1,000 heat units (degree days). Heat unit cumulation was over 1,000 for most plantings made after June 5.

Our results show that late June and early July plantings accumulated considerably more heat units than early

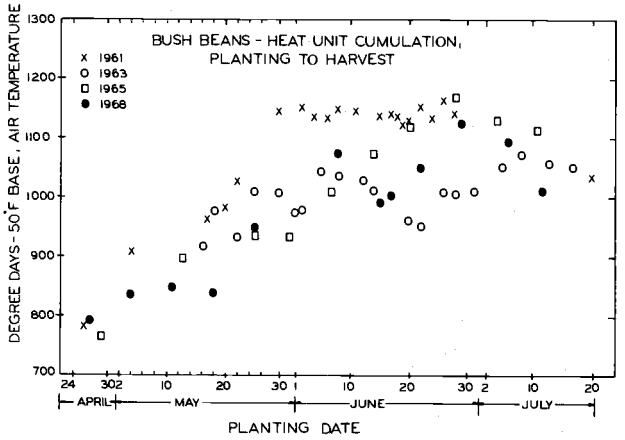

Figure 5. Effect of planting dates on heat unit cumulation of bush beans.

plantings. Some processors have selected base temperatures lower than 50° F for calculating heat unit cumulations for snap beans because they have felt that a lower temperature might eliminate some of the variability encountered at 50°. It is not the purpose of this article to give a detailed discussion of the use of the heat unit system and selection of the base temperature, but references for background information will be given later. Observations on bush beans and heat units during 1952, 1959, and 1960 were reported earlier in *Oregon Vegetable Digest*, Vol. 10, No. 3, July 1961.

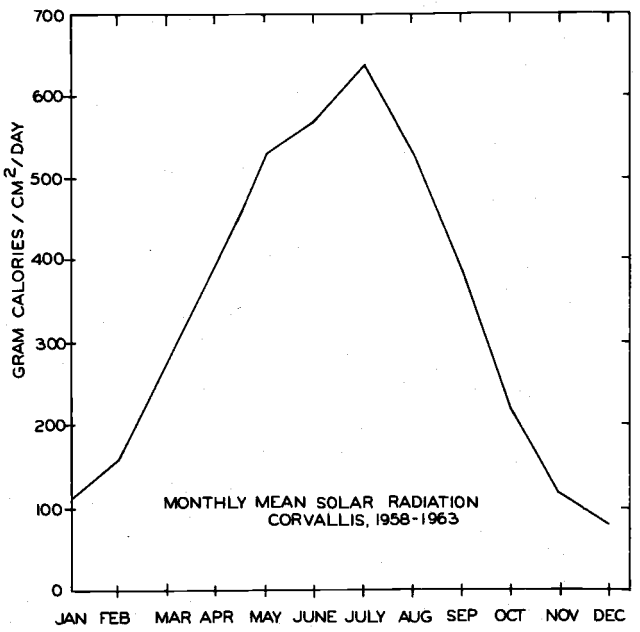

Figure 6. Monthly mean solar radiation, Corvallis, 1958-1963.

Mid-season plantings of bush beans have yielded more than early or late plantings. Many factors are involved in affecting yields: air and soil temperatures at planting, during bloom, and at other times and other climatic factors that are related to plant nutrition, moisture stress, and incidence of diseases such as root rot. All of these factors interact with genetic materials in affecting growth and yields. Total solar radiation may also favor mid-season plantings. Figure 6 shows that monthly mean solar radiation, expressed as the average total daily cumulation, was highest during July. These data for 1958-1963 were supplied by Dr. O. C. Compton of the Horticulture Department and were obtained from the Lewis-Brown Horticultural Farm near Corvallis.

The following references on heat units may be of interest:

Arnold, C. Y. 1959. The determination and significance of the base temperature in a linear heat unit system. Proc. Amer. Soc. Hort. Sci., *74*:430-445.

Arnold, C. Y. 1960. Maximum-minimum temperatures as a basis for computing heat units. Proc. Amer. Soc. Hort. Sci., *76*: 682-692.

Holmes, R. M., and G. W. Robertson. 1959. Heat units and crop growth. Canada Dept. of Agric. Public. 1042 (Plant Research Inst., Ottawa).

Seaton, H. L. 1955. Scheduling plantings and predicting harvest maturities for processing vegetables. Food Tech., *9*:202-209.

—H. J. Mack
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Pea Varieties Evaluated for Blonding

Twelve selected varieties of peas were grown on the Myron Hug farm near Imbler in Union County in a randomized block experiment with five replications. This was the fifth consecutive year in which efforts were made to discover varieties not subject to blonding. The varieties and their sources are listed in Table 1.

Table 1. Varieties and sources of peas

Variety	Source
157-F	Western Valley
159-F	Western Valley
Coronet	Asgrow
Mohawk	Asgrow
Venus	Asgrow
XP-L-14	Asgrow
XP-M-67	Asgrow
M-410	Brotherton
D. S. Perfection	(Check)
436-1	OSU
Puget	Brotherton
W-43	Brotherton

Efforts were made to harvest each variety at tenderometer values between 95 and 105, but with small off-station plots of this kind it is not possible to impose rigid controls and more variation in harvest maturity occurred in 1968 than in previous years. Because of the influence a small difference in maturity has upon yield of peas, the yield data are omitted to avoid misleading interpretations.

Samples from each plot were blanched and scored. The results are summarized in Table 2.

For the second year, Venus was judged best in overall appearance.

Table 2. Mean values of observations of pea color scores 1968, Blonde Pea Trials, Union County, Oregon

Variety	USDA color score*	Intensity of color score*	Blondeness color	Uniformity color score*
			%	
157-F	18.6	7.2	1.00	6.4
159-F	16.2	6.4	4.40	3.6
Coronet	18.4	7.0	1.10	6.4
Mohawk	19.6	7.4	0.25	9.4
Venus	19.0	7.6	0.20	8.6
XP-L-14	17.2	6.8	3.00	4.8
XP-M-67	18.6	7.0	1.10	7.0
M-410	17.8	6.8	2.20	6.4
D. S. Perf.	16.6	7.8	4.10	5.4
436-1	16.4	7.0	3.80	4.2
Puget	18.4	7.0	1.15	8.2
W-43	17.4	6.8	2.60	6.8
LSD 5%	1.0	NS	1.7	1.8
1%	1.3	NS	2.3	2.4

* The higher the score, the better the color rating.

Substantial progress has been made in selecting pea varieties that are less subject to "blonding"; for that reason these tests will be discontinued after 1969 and attention directed to yield-stimulating practices.

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