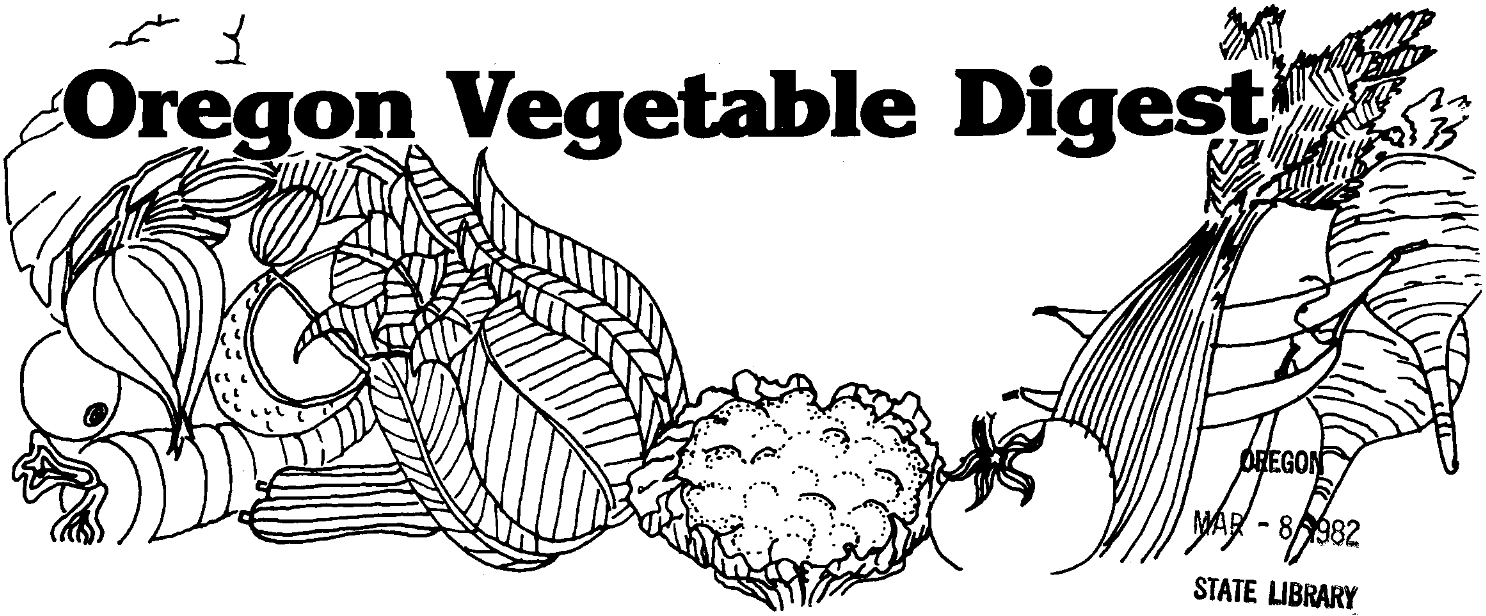
Oregon Vegetable Digest



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Water Stress Reduces Bush Bean and Sweet Corn Yields

Bush beans and sweet corn were grown under three irrigation regimes (dry, intermediate, and wet) at the OSU Vegetable Research Farm in 1981. Jubilee sweet corn was planted on June 23 and Oregon 1604 and Roma bush beans were planted on June 26. Each irrigation plot was approximately 20 x 30 feet and about one-half was devoted to sweet corn in 36-inch rows and the rest to bush beans in 36-inch rows. The dry and wet irrigation treatments were replicated three times but there were only two replications of the intermediate treatment. Number and amounts of irrigation for the three treatments are listed for bush beans in Table 1 and for sweet corn in Table 2. All plots were irrigated with 0.5 inch of water on June 26 (which is not included in the table totals). The dry treatment received two irrigations, on July 3 and August 1. The intermediate treatment was irrigated at about 20 to 25 day intervals and the wet treatment at 7 to 10 day intervals.

First bloom was on August 3 for Oregon 1604 and on August 5 for Roma. Date of 10 percent silk was about August 27 for Jubilee sweet corn. Unusually high maximum air temperatures occurred during August 7-12, with temperatures above 100°F on four days. Average maximum temperatures for a 10-day period, beginning one day after first bloom, were 91°F for Oregon 1604 and 94°F for Roma.

Once-over harvest was made for Oregon 1604 on August 30 and for Roma on September 1, 68 and 70 days, respectively, after planting. Pods of Oregon 1604 were graded for information on sieve size distribution. Data in

In this Issue

Table 1 show that yields of bush beans were markedly reduced in the dry and intermediate irrigation treatments compared to the wet treatment. Number of pods per plant was much lower in the dry and intermediate treatments and plants in these treatments had a "split-set." Percentages (by weight of pods) of sieve sizes 1 and 2, 3, 4, 5, and 6 averaged 24, 15, 15, 16, and 25 percent, respectively, for the dry and intermediate treatments combined, but averaged 5, 10, 11, 22, and 33 percent for the respective sieve sizes for the wet treatment. Total yields and number of pods per plant for Roma showed a similar trend of response to irrigation treatments as did Oregon 1604 (Table 1).

The problem of split-set in beans, apparently related to high temperatures during bloom, was alleviated in the wet treatment. Wet treatment was irrigated on August 1, 8, 13, and 22; the dry treatment received no further irrigation after August 1, and the intermediate treatment was irrigated on August 1 and 25. Plant canopy temperatures were considerably lower during flowering and early pod development in the wet treatment than for the dry and intermediate treatments and likely were related to no distinct split-set observed in the wet treatment.

Total unhusked ear yields and husked, graded yields of Jubilee sweet corn, harvested on September 29, 98 days after planting, were highest in the wet irrigation treatment (Table 2). Average number of acceptable ears per plant was about 45 percent higher in the wet than in the dry treatment, with average weight of husked ears only 8 percent higher in the wet treatment. Yield was slightly higher for the intermediate irrigation treatment than for the dry treatment.

Table 1. Effects of three irrigation treatments on yield of bush beans, Corvallis, 1981

Irrigation treatments	No. irrig.	Water appl.(in.)	Oregon 1604			Roma	
			T/A	pods/plt	%1-4's	T/A	pods/plt
M1 dry	2	2.5	0.9	6.0	57	1.0	3.1
M2 intermed.	3	4.6	0.7	3.3	50	1.5	3.8
M3 wet	8	9.5	8.3	24.0	26	5.5	9.9

Table 2. Effects of three irrigation treatments on yields of Jubilee sweet corn, Corvallis, 1981

Irrigation treatments	No. irrig.	Water appl.(in.)	Yield - T/A		Wt./ear lb.	Ears/plt. no.	% Moisture kernels
			Total unhusked	Husked graded			
M1 dry	2	2.5	6.2	4.1	.59	.96	72
M2 intermed.	4	7.1	6.7	4.4	.64	.94	75
M3 wet	10	13.0	9.5	6.4	.64	1.39	71

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Overwintered Onions Tested

The purpose of this experiment was to evaluate the performance of several onion cultivars in overwinter trials. The Willamette Valley appears to have a suitable climate for production of spring-harvested onions if bolting, disease, and weed control problems can be overcome. Previous experiments at the North Willamette Station have indicated that late August planting dates are superior to September planting dates for maximum yields. With a June or July harvest, this would allow double-cropping the onion ground before planting and after harvest.

The plots were seeded on September 3, 1980, at a plant population of about 14 plants/foot and thinned to no more than 8 plants/foot. Plot size was 1 row x 20 feet with 1.5 feet between rows. The plot area was fertilized with 700 pound/acre of 10-20-10 before planting and four pounds of propachlor herbicide was applied immediately after seeding. Spring nitrogen applications were made as follows: 100 lb/A of 34-0-0 on January 16, 1981, and 300 lb/A of 34-0-0 on April 15, 1981. Varieties were seeded in a randomized complete block design with four replications. All plants were topped on July 2, 1981 and plots were harvested on July 16, 1981, 316 days after planting. Plant population at harvest was 7-8 plants/foot for most varieties. Several varieties were selected for a storage test. A sample of bulbs was held at room temperature and humidity in mesh bags. Degree of rot and sprouting were evaluated on October 27, 1981, after 113 days in storage.

The winter of 1980-81 was exceptionally mild, particularly in January. Most varieties exhibited significant bolting. Since all varieties were harvested on the same day, a few were overmature and suffered some sunscald. However, little regreening occurred. Some varieties exhibited a small percentage of split bulb basal plates. This may have been caused by exposure to moisture after tops died down or to maggot damage.

Highest yielding varieties in terms of gross weight were Sweet Winter 1909, Red Cross, Keep Well, Senshu Yellow Globe, OWY 100, and Willamette Sweet (Table 1). Largest mean bulb size was obtained with Sweet Winter 1909, Senshu Yellow, Red Cross, Keep Well, and OWY 100. When the bulbs which had produced seedstalks were subtracted from the total yield, the rankings changed significantly. Highest estimated usable yield was obtained with Red Cross, followed by Keep Well, Dragon Eye, Senshu Yellow 7991, Sweet Winter 1909, Willamette Sweet, OWY 42, and OWY 100. Imai also yielded very well, but the stand was not thinned and the plots were not randomized.

Particularly high quality varieties in terms of color, lack of bolting and splits, small neck size included Keep Well, Imai, Senshu Yellow, and Red Cross (Table 2). Sweet Winter 1909 and Willamette Sweet were also impressive but had a high percentage of bolters. Red Cross was particularly mild-flavored. Varieties considered overmature at harvest were Amber Express, Red Cross, Express Yellow, and Dragon Eye.

At the end of about three months storage, Keep Well and OWY 100 exhibited the smallest degree of sprouting while 100 percent of the Red Cross bulbs had sprouted (Table 3). The degree of storage rots, molds, and maggot damage was low for all varieties except Keep Well.

Table 1. Yield of Varieties of Overwintered Onions, 1980-1981

Variety	Mean bulb wt. (g)	Rank	Total yield tons/A	Rank	Estimated Usable yield (tons/A)	Rank
Sweet Winter 1909	178	1	40.8	1	21[c]	5
Senshu Yellow 7985	170	2	43.2	4	17[c]	10
Senshu Yellow 7991	164	3	30.9	7	23	4
Red Cross	157	4	35.7	2	32	1
Keep Well	131	5*	34.6	3	29	2
OWY 100	131	5*	33.0	5	19	8
Dragon Eye	123	7	24.8	9	25	3
Willamette Sweet	120	8	31.1	6	20	6*
OWY 50	118	9	29.6	8	13[c]	13
AC 7952	116	10*	19.8	13	16	11*
AC 7949	116	10*	17.5[a]	14	9[c]	16*
AC 7948	113	12	23.1	10	12[c]	15
Express Yellow	102	13	17.5	15	17	9
AC 7950	99	14	20.8	11	9[c]	16*
Gladalan Brown	89	15	13.9[a]	18	7[c]	18
Early Golden Globe	88	16	10.4[a]	19	5[c]	19
Amber Express	86	17	16.2	16	16	11*
Braeside	79	18	15.3	17	12	14
Pukukohe	76	19	5.7[a]	26	1[c]	22
OWY 42	75	20	19.9	12	20	6*
Kitami Ki	69	21	8.3[a]	23	0[d]	--
Creamgold	67	22	9.7	20	0[d]	--
Sapporo Yellow	63	23	8.7[a]	22	0[d]	--
Sapporo Mi	59	24	9.2[a]	21	0[d]	--
Creamgold Early	58	25	6.4[a]	24	3[c]	20*
Early Locker Brown	48	26	6.0[a]	25	3[c]	20*
Imai	109[e]	--	39.9[e]	--[e]	36[e]	--

[a]Poor stand, less than 5 plants/foot. Desired stand: 7-8 plants/foot.
[b]Total yield less yield of bolters.
[c]50% or more bolters.
[d]100% bolters.
[e]Non included in replicated planting. Excessive stand of ∿ 11 plants/foot.
*Indicates a tie.

VEGETABLE NOTE --

Low Temperature Priming of Onion Seeds

The effects of priming or hydration in -1.1 PMa solutions of 0.24M NaCl or 0.1M KNO_3 + 0.1M K_3PO_4 at 10°C on percent emergence, time to 50 percent emergence (T_{50}), and spread of emergence (T_{90}-T_{10}) of onion seeds were evaluated. Increasing priming durations for 2, 4, 6, and 8 days progressively decreased T_{50} emergence. Seeds primed for eight days displayed a three-day reduction in T_{50} emergence. Spread of emergence was also reduced with increasing priming durations in both osmoticums. Eight-day priming treatments decreased the spread by 14 percent when assayed under sub-optimal conditions (10°C). Percent emergence of seeds primed for eight days in NaCl or KNO_3 + K_3PO_4 osmotic solutions were 91 percent and 89 percent respectively, which did not differ from controls (91 percent). There appears to be no difference between either osmoticums in providing uniformity and earliness of emergence in onion seeds. (Sheldon C. Furutani, Bernard H. Zandstra, and Hugh C. Price. HortScience, Vol. 16(3):71, June 1981.)

Table 2. Source of Varieties and Quality Characteristics of Overwintered Onions

Variety	Source[a]	Maturity[b]	Bulb Shape[c]	Color[d]	% Bolted	Neck[e]	Split bulbs[f]
AC 7948	1	2	f-t	2	50	1.5	1
AC 7949	1	1	t	2	50	1.5	2
AC 7950	1	2	f-t	2	50-60	1	2
AC 7952	1	3	fg-g	2	20	1	2
Amber Express	2	1	f-t	3	0	1	3
Braeside	1	2	g-s	2.5	20	1.5	1
Creamgold	1	2	dg	3	100	2	1
Creamgold Early	1	2	g	3	50	2	1
Dragon Eye	2	1	f-g	2	0	1	2
Early Golden Globe	1	3	dg	2	50	1.5	1
Early Locker Brown	1	2	dg	3	50	2	1
Express Yellow	1	1	f-t	2.5	5-10	1	1
Gladalan Brown	1	2	dg	2	50	1	1.5
Imai	2	2	t	1.5	10	1.5	1.5
Keep Well	2	2	t-v	1.5	15	1	1.5
Kitami Ki	3	3	f-g	2.5	100	3	1
OWY 42	4	1	f	3	0	1	2.5
OWY 50	4	3	t-v	2.5	55	1.5	2
OWY 100	4	2	fg-t	2	40	1.5	2
Pukukohe	3	3	g	2	80	3	1
Red Cross	2	2	f	red, poor[g]	10	1	1.5
Sapporo Ki	3	3	s	1	100	3	1
Sapporo Yellow Globe	3	1	s	1	100	3	1
Senshu Yellow 7985	1	3	t	1.5	50	1	2
Senshu Yellow 7991	1	2	g-t	2	25	1.5	1.5
Sweet Winter 1909	4	2	ft	1	50	1	1.5
Willamette Sweet	4	2	fg	2.5	35	1	1.5

[a] 1: International Plant Breeders, Inc. 2: Takii Seeds. 3: N. S. Mansour, Department of Horticulture, Oregon State University, Corvallis. 4: Dessert Seed Co.
[b] 1: early, all tops down by 6/11/81. 2: mid-season. 3: late, tops down 7/5/81.
[c] f = flat; fg = flat globe; g = globe; dg = deep or elongated globe; t = top; s = spindle; tv = top, variable.
[d] 3: poor, light. 1: good, medium dark yellow-brown.
[e] 3: large. 1: small, fine, well-cured.
[f] 1: less than 1%. 2: 1-5%. 3: over 5%.
[g] bleached, sunscald.

VEGETABLE NOTE --

Effect of Polyethylene Glycol Pretreatment on Early Growth and Metabolism in Onion (Allium cepa L.)

Pretreatment of three varieties of onion seed in polyethylene glycol (PEG) (-15 bars, 15°C, 14 days) accelerated the rate of germination as compared to untreated seeds. Treated seeds also demonstrated a higher rate of seedling growth between 4 to 8 days after radical emergence. During treatment in PEC, the level of soluble sugars (mainly sucrose) rose slightly (12 percent) after an initial drop of 10 percent, suggesting a steady state utilization of storage carbohydrates. During early seedling growth, treated seeds were found to have a different pattern of endosperm mannan hydrolysis and utilization than untreated seedlings. (Kathleen Hatridge-Esh and Tom Orton. HortScience Vol. 16(3):45, June 1981.)

Table 3. Storage Ratings of Overwintered Onions, 1980-1981

Variety	Percent Sprouted	Percent Rotted
Dragon Eye	60	4 (very firm)
Keep Well	8	60 (maggot infested)
OWY 50	21	4
OWY 100	11	0
Red Cross	100	15
Sweet Winter 1909	45	25 (soft)
Willamette Sweet	30	4

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Tomato Varieties Studied

Six commercial tomato varieties were tested for yield in 1981 in conjunction with evaluation of OSU T-11, an extremely early breeding line being considered for release. Included for a range of maturity and size were the following:

'Willamette', a medium early, determinate, variety released by Oregon State University in 1964, and a standard in Western Oregon. The fruits of 'Willamette' are medium large, bland in flavor, fleshy, and somewhat resistant to cracking. The plant is compact.

'Early Girl', an earlier variety which has become popular during the past few years. 'Early Girl' has a medium size fruit with good flavor. The plant is indeterminate and sprawling.

'Presto', an early variety with medium small (1 3/4-2") fruit on a compact, determinate plant.

'Early Subarctic', an early variety with an extremely determinate, sparse plant. The abundant, 2-inch fruits are exposed and have poor color.

'Immuna Prior Beta', (IPB) an indeterminate variety with a sprawling plant. The first ripening date is quite early, but the total crop of 2-inch fruits matures slowly. Fruits are soft and of mediocre quality.

'Kootenai', a compact, medium early, determinate variety with dark green foliage and good fruit color.

The experimental line being evaluated, OSU T-11, is earlier in maturity at Corvallis than the earliest commercial varieties included, or any commercial varieties ever tested in this program. The plant is determinate, but prostrate and open. The 2-inch fruits have good flavor, but sometimes crack. OSU T-11 would be most valuable for very early use before varieties with better fruit size and quality are ready.

The 1981 trial included 4 replications in a randomized block design. Rows were 6 feet apart; plots were 20 feet long with 10 plants, 2 feet apart. The plants were greenhouse grown, and transplanted May 13 into rows with banded 8-24-8 fertilizer at 600 pounds/acre. Water was applied by sprinkler about every 2 weeks, but was terminated when ripening was well underway. In the beginning of the picking period, all 10 plants per plot were harvested, but it became necessary for most harvests, to use only 5 plants per plot. Plots were harvested once each week, except that more frequent harvests were made at the beginning of the season to better identify first ripe fruit date.

Harvests were terminated for each variety when only fruits of up to about 1 inch in diameter remained.

Table 1 shows mean yields in weight and number of fruit per plant and per acre. The large fruited varieties 'Willamette' and 'Early Girl' were well above the earlier varieties in fruit weight per plant. The five earliest varieties were somewhat similar in yield. 'Presto' had the greatest number of fruit but also the lowest average fruit weight.

OSU T-11 was the lowest in yield, though not significantly lower than 'Early Subarctic', which had identical average fruit weight that was higher than both 'IPB' and 'Presto'. OSU T-11 was one week earlier in first ripe fruit than 'IPB', two weeks earlier than 'Early Subarctic', about three weeks earlier than 'Presto', 'Kootenai', and 'Early Girl', and more than a month earlier than 'Willamette'. 'Early Girl' was 12 days earlier than 'Willamette', which is probably typical of the difference normally observed between these varieties.

Earliness, along with length of season and concentration of ripe fruit, is also shown in Table 2. Length of picking season varied from 6 weeks for 'Early Subarctic', to 10 weeks for 'IPB'. OSU T-11 had an 8-week bearing season with a relatively early peak of production, similar to that of 'Early Subarctic'. Although 'IPB' started ripening only one week later than OSU T-11, it was slow to reach its peak, which lasted 4 weeks. By the end of the fourth week (8-2), OSU T-11 had yielded 3.9 pounds per plant while 'IPB' had only .65 pounds/plant on the same day, and 1.27 pounds/plant at the end of its fourth week of harvest. Likewise, 'Early Girl' was less concentrated than 'Willamette'. The long, less concentrated picking season is characteristic of indeterminate varieties such as 'IPB' and 'Early Girl'. OSU T-11 had 66 percent seedless fruits (Table 1), compared to 6 percent for 'IPB' and 0 percent for the remaining varieties. The seedless fruit of OSU T-11 are solid and of good quality.

Maturity date information for additional varieties is shown in Table 3. Some of these data are from plots direct seeded on May 14. The direct seeded plants started ripening fruit about three weeks later than transplanted counterparts. Maturity dates obtained from direct seeded plots appear to be fairly predictive of earliness in transplanted tomatoes.

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VEGETABLE NOTE --

Efficacy of Vegetable Herbicides Applied Through Irrigation Systems

The following herbicides were applied to vegetable crops through center pivot irrigation systems located on Tifton sandy loam and Lakeland sand: tomatoes-diphenamid (4.48 kg/ha), metribuzin (0.56 kg/ha); watermelon-(1.68 kg/ha); cucumbers-ethalfluralin (1.4 kg); turnip greens-DCPA, (12.3 kg/ha); spinach-cycloate (2.52, 3.36 kg/ha), CDEC (3.36 kg/ha); collards-DCPA (12.3 kg/ha). Herbicides were applied using 0.62 to 2.5 cm of water. Except metribuzin on tomatoes, all herbicides were applied preemergence to crop indicated. Crop tolerance to all herbicides was good to excellent. Metribuzin applied postemergence caused slight injury to small tomato plants. Also preemergence cycloate (3.36 kg/ha) caused some injury to spinach. However, this injury was less than that caused by conventional applications. Weed control obtained with above herbicides applied through center pivot irrigation systems was equal or better than the control obtained with conventional methods. (S. C. Phatak, N. C. Glaze, C. C. Dowler, and E. D. Threadgill. HortScience, Vol. 16(3):93, June 1981.)

Table 1. Field performance of tomato varieties, Corvallis, Oregon, 1981

	First ripe fruit		Fruit yield[1]				g. av. fruit wt.	% seedless
	date	days	No/ plant	No/1000 acre	lbs/ plant	tons/ acre		
OSU T-11	7-13	61	167[b]	605	12.25[a]	22.05	31.78	66
IPB	7-21	69	288[c]	1047	18.34[bc]	33.00	27.24	6
E. Subarctic	7-27	75	207[b]	751	14.74[ab]	26.53	31.78	0
Presto	8-3	82	352[d]	1277	19.92[c]	35.85	22.70	0
Kootenai	8-6	85	168[b]	609	17.81[bc]	32.06	45.40	0
Early Girl	8-5	84	118[a]	499	27.19[d]	48.94	108.96	0
Willamette	8-17	96	113[a]	409	29.74[d]	53.5	113.50	0

[1]Variety means for pounds fruit per plant and fruit number per plant were not statistically different (at 5% significance) when the same letter is present.

Table 2. Seasonal yield pattern of tomato varieties; pounds/plant

Variety	Week Beginning											
	7-13	7-19	7-26	8-2	8-9	8-16	8-23	8-30	9-6	9-13	9-20	9-27
OSU T-11	.05	.14	.69	3.03	3.19	2.40	1.70	1.05				
IPB		.06	.24	.35	.62	3.25	3.05	3.36	3.24	2.10	2.27	
Early Subarctic			.59	1.79	1.78	4.37	4.20	1.32				
Presto				.19	.73	3.85	5.54	3.58	4.14	1.29	.76	
Kootenai				.21	.42	5.02	3.34	4.15	2.63	.99	.74	
Early Girl				.01	.09	1.40	2.82	8.53	7.64	5.36	1.85	.71
Willamette						.34	.74	6.15	10.33	5.84	3.99	1.10

Table 3. Date of first ripe fruit and general observations of transplanted and direct seeded tomato varieties, Corvallis, Oregon, 1981 [1]

Variety or line	Source[2]	Date of first ripe fruit: Transplanted date	Transplanted days	Direct seeded date	Direct seeded days	Notes
OSU T-11	1	7-13	61	8-1	79	
Benewah	2			8-21	99	2½-3", red, good solidity, fair firmness
Mountain One	2			8-15	93	looks like Early Subarctic, but larger; acid flavor; 2½"
Gem State	2			8-5	83	very dwarf plant, exposed fruit, 1½", little flavor
Large German Cherry	1	8-9	88	8-21	99	soft fruit, bright color, 1½" fruit
Large Red Cherry	3			9-11	121	
Starshot	4	8-11	90	9-2	112	compact plant, smooth fruit
Willamette	1	8-17	96	9-1	111	smooth, little cracking, 3-3½, good solidity, fair firmness
Jet Star	3	8-21	100			
Sweetie	5	8-6	85			looks like Sweet 100, very spreading plant, sweet fruit
Roma	6	8-20	99			paste tomato, very thick walls, very solid
Better Boy	6	8-30	109			fruit large, good flavor, 2½-3½" or larger, solidity good
Shoshone	2	7-30	78			resembles Early Subarctic, 2-2½", poor color
Beefmaster	3	8-23	102			fruit up to 5", bad cracking and rotting, solidity good
Yellow Pear	7	8-21	100			very spreading plant to 10'
Quick Pick	8	8-18	97			good flavor, good deep shape
Big Pick	8	8-31	110			
Royal Flush	9	8-29	108			3-4", very good firmness, good solidity, medium, compact plant
Red Pear	3	8-14	93			rank plant
Latah	2	8-15	94			1 3/4-1 7/8", poor firmness
Bonner	2	8-1	80			1½" and smaller; fair solidity, poor firmness
Castlehy 101	10	8-29	108			very large, largest flat fruit somewhat rough
Sleaford Abundance	11	8-11	90			2½" fairly firm, solid, globe shape
Pik-red	3	8-24	103			3½", good solidity and firmness, fruit keep well
Floramerica	5	8-23	102			3-4", solid, fairly firm
Bonus	5	8-24	103			2½-3½", poor firmness, good solidity, compact plant
Jubilee	5	8-30	109			very late, fruit cracks and rots early, good flavor, yellow
Castleprize	10	8-26	105			3-4½
Sandpoint	2	8-5	84			2-2½, dwarf plant, poor firmness, good solidity
Ace	12	8-31	110			smooth
Pink Pearl	17			8-10	88	pink, seedless type, identical in all respects to Oregon T5-4
T3 B	13	7-28	76			
T11A	13	7-31	79			partially seedless, deep globe, mild, small leaf, brushy
Alfresco	11	8-10	89			globe, good red, poor firmness, smooth, 2½"
Spring Giant	7	8-22	101			3-3½", compact plant, fair to poor firmness, good solidity
Hope #1	14	8-31	110			3-3½", solid, fair firmness, open plant
Master #2	14	8-22	101			2½-3½", solid, fair firmness, sprawling open plant
Super Fantastic	6	8-21	100			indeterminate rambling plant
Mini Spartan	15	8-3	82			bright red, little flavor, tight, stiff, wilty plant
Sweet 100	3	8-5	84			small, sweet, low acid, plant very spreading
Yellow Plum	3	8-18	97			very rank, spreading plant, good sweet flavor
Parks Whopper	16	8-30	109			2½-3½", good solidity and firmness, indeterminate and late
Oregon Cherry	1	7-29	77			1-1½", acid flavor, prostrate plant, may crack
Medford	1	8-27	106			3-3½" good solidity and firmness, crack resistant
Small Fry	5	8-11	90			good acid flavor, medium compact plant, 1-1½"
New Yorker	5	8-12	91			2½-3", poor firmness, fair solidity, cracks

[1] Transplants set out May 13; direct seeding done May 14. Dates given were obtained from weekly observations and are approximate.
[2] Sources of varieties: 1-Horticulture Dept., Ore. State Univ., 2-Mt. Seed & Nursery, 3-Joseph Harris, 4-Stokes Seeds, 5-Petoseed, 6-Ball, 7-Burpee, 8-Goldsmith, 9-Ferry Morse, 10-Castle, 11-Sharpes, 12-Asgrow, 13-Horticulture Dept. Wash. State Univ., 14-Takii, 15-Horticulture Dept., Mich. State Univ., 16-Parks, 17-Horticulture Dept., South Dakota.

Edible Pod Pea Developed

'Oregon Sugarpod II' is a powdery mildew resistant edible pod pea developed to supplement or replace the mildew susceptible variety 'Oregon Sugarpod,' which was introduced in 1971. Although 'Oregon Sugarpod' has become established as a home and market variety, powdery mildew cam limit its use, especially in commercial production. In Western Oregon, for example, 'Oregon Sugarpod' is satisfactory in spring plantings, but crops harvested in September or later may be severely affected by powdery mildew. Except for having resistance to powdery mildew, 'Oregon Sugarpod II' is usually indistinguishable from the original variety, and has the same resistance to enation mosaic virus needed for production in Western Oregon and Washington. It is being released with the recommendation that careful comparisons with the original 'Oregon Sugarpod' be made in a diversity of situations before offering it commercially as a replacement. Where powdery mildew is a problem, the new variety should be clearly preferable.

'Oregon Sugarpod II' was tested as OSU 581, an F_6 selection from the cross OSU B 271 x 'Oregon Sugarpod.' In the pedigree, also involved was P 601, a breeding line obtained from the Gallatin Valley Seed Company. The Geneva, New York, Agricultural Experiment Station provided G 59-29, the source of powdery mildew resistance, and the G 168 selection from P.I. 140295, the source of enation mosaic resistance for both 'Oregon Sugarpod' and OSU B 271.

The plant is of the 'Perfection' type, generally reaching 24 to 30 inches in height. The stem is zigzag, with moderately large leaves and stipules. First bloom is usually at node 16. Number of days to edible pod maturity at Corvallis is 55 to 60 days when planted in mid-May.

Pods, normally borne in pairs, are commonly 4 inches long x 7/8 inch wide. Strings and traces of sidewall fiber, present after seeds become conspicuous, are typical of most edible-pod cultivars. Flavor is mild and quality is generally good. Seeds in the green shell stage are light in color and not of table quality.

Seeds are dimpled. No unusual germination problems have been observed. Seed count is about 1680/lb.

'Oregon Sugarpod II' has good field resistance to enation mosaic virus. It is moderately resistant to red clover vein mosaic virus, but tends to produce conspicuous yellow and necrotic symptoms when late infections occur. It is resistant to powdery mildew (Erysiphe polygoni DC) and common pea wilt (Fusarium oxysporum f. pisi [Linford] race 1 Snyder and Hansen).

Major seedstocks have been allocated to commercial pea seed producers. Small lots for trial may be obtained from J. R. Baggett, Department of Horticulture, Oregon State University, Corvallis, OR 97331.

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Horticulture Department

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News and Notes

Alteration of Sex Expression in Cucumber Caused by Changes in Temperature, Light Intensity, and Photoperiod

Five pickling cultivars and a breeding line of cucumber (Cucumis sativus L.) were grown under varying environmental conditions to determine the influence of light and temperature on sex expression. More staminate flowers were produced under 17,200 lux light intensity than 8,600, 12,900, or 25,800 lux, whereas more pistillate flowers reached anthesis under the highest two light intensities. A gynoecious line, MSU 713-5, produced no staminate flowers under varying light intensities; however, gynoecious hybrids did. Altering the length of the photoperiod or red and far-red light exposure at the end of the light period had no influence on sex expression. Few staminate flowers were produced when the plants were grown at a constant 16^{o} or $22^{o}C$, but all lines or cultivars produced some staminate flowers at 30^{o}. The largest number of pistillate flowers reached anthesis at 26^{o} or 30^{o}. Temperature influenced sex expression more than light intensity or photoperiod. (Daniel J. Cantliffe, Journal of the American Society for Horticultural Science. 106:133-136. 1981.)

Germination Studies of Clay-coated Sweet Pepper Seeds

Seed germination of sweet pepper (Capsicum annuum L.) is inhibited after the seed is coated. The inhibitory effect of pellet-coating of 'Early Calwonder' pepper seed was caused by the physical properties of the coating materials. Clay coating limited part of the oxygen (0_2) from reaching the germinating seed and provided a mechanical barrier to protrusion of the radicle. Clay-coated pepper seed germinated satisfactorily on filter paper in a high 0_2 environment or with minimum moisture on agar. Pellet coating formulations which would provide more 0_2 to the imbibing seed would assure comparable germination of raw and coated sweet pepper seed. (M. Sachs, D. J. Cantliffe, and T. A. Nell. Journal of the American Society for Horticultural Science. 106(3):385-389. May 1981.)

Interaction of Mycorrhizae and Phosphorus Levels on Onions on Muck Soil

Onions (Allium cepa, L.) were grown in two muck soil fields, with available P levels of 3 kg/ha and 97 kg/ha, respectively, which contained an indigenous population of mycorrhizal spores (Glomus sp.). Treatments included four levels of added P (0, 30, 97, 197, kg/ha P) and inoculum containing spores of the mycorrhizal fungus (Glomus etunicatus). In the low P field, bulb weight increased with added P. Root infection and spore numbers were negatively correlated with added P. Bulb weight and spore numbers increased when mycorrhizal inoculum was added to the soil. In the high P field, there were no responses in bulb weight, root infection, or spore numbers to either added P or added inoculum. Root infection data from both fields indicated that there was a threshold level of soil P below which infection was high and above which infection was low. (Bernard H. Zanstra, Sheldon C. Furutani, and Charles E. Nelson. HortScience, Vol. 16(3):39-40, June 1981.)

Nitrogen Uptake and Metabolism of Carrot Roots as Influenced by Nitrogen Fertilizer and Herbicides

This study was undertaken to determine the effects of nitrogen fertilizer and commercially recommended herbicides on nitrate accumulation, total N, color, and percent dry weight of carrots (Daucus carota) at harvest as well as after storage. In 1979, carrots were grown on a mineral soil with 0, 90, and 202 kg/ha nitrogen applied in combination with no herbicide, Treflan, Lorox or a combination of both Treflan and

Lorox. All plots were handweeded to eliminate differing degrees of weed interference. The carrots contained similar amounts of NO_3-N at harvest and also after six months storage at 0-1^{o}C and 98 percent RH. The amount of total N was higher at higher rates of nitrogen fertilizer. Carrots receiving high nitrogen had the lowest color measurements (Hunter 'a' values) both initially and after six months of storage. A loss of color in storage was observed in roots from all treatments. The experiment was repeated in 1980 on both muck and mineral soils with additional herbicides and higher levels of nitrogen fertilizer. (D. A. Chessin, J. R. Hicks, and P. L. Minotti. HortScience Vol. 16(3):42, June 1981.)

Effect of Between-Row Spacing on Pigment Yield of Table Beet (*Beta vulgaris* L.)

With the increasing use of beet pigments (betalaines) as coloring agents in processed foods, cultural methods for table beets must be reevaluated for maximizing pigment yield per unit land area rather than root yield. In two experiments, the effects of between-row spacing and cultivar on root and pigment yields of table beets were investigated. Betacyanine and betaxanthine concentrations were higher in the smaller roots, but total betacyanine and betaxanthine content in the root increased with size. The greatest yield of pigment was observed at 20 cm row spacings, caused largely by the higher plant population and the smaller average root size. Total root yields were greatest at the 30 cm row spacing. (Timothy J. Ng, Cheryl A. Wilczek, and Charles A. McClurg. HortScience Vol. 16(3):43, June 1981.)

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