OREGON VEGETABLE Digest

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APR 1 1971

Volume XX | Oregon State University, April 1971 | Number 2

New Bush Bean Lines Tested

Several new Oregon bush beans lines were included in two well replicated tests (planted May 4, June 25) at the vegetable research farm in 1970. Also included were USDA line 9C10, Idaho lines 276-1 and 121-15-3, and Early Gallatin.

Yields of all lines, except 1604, were low in the May 4 planting. These plots were located in our "disease" area on the research farm and all plants were moderately to severely infected with root rot. No plants in this early planting were infected with yellow mosaic virus. Temperatures from mid-May until the harvest dates (July 13-15) fluctuated rather widely from warm to cool and it is believed that these fluctuations, along with root rot infection, accounted for a distinct split set in many of the breeding lines and varieties. Sieve size data in Table 1 show clearly the results of this split set, with some lines having low percentages of pods in sieve sizes 4 and 5, and relatively high percentages in sieves 1, 6, and 7. In the late planting, all lines and varieties showed a more normal sieve size range (Table 2).

Most of the new Oregon lines have been selected for smaller sieve sizes than Oregon 58. In general, they are smaller sieved and appear to have yielding ability equal to Oregon 58. Growth habits are generally not as good as 58, yet they are better than the older Oregon releases 949 and 2065.

Three sub-lines of Oregon 190 were placed in the test; 190-17 appears to be the most promising of these lines. Oregon 190, a small sieved bean as shown by the data, is resistant to field infection by the yellow mosaic virus and carries good tolerance to the halo blight bacterium. Seed increase is being made in New Zealand. There is evidence of considerable mutation in 190 for the small flats and ovals characteristic of Blue Lake germ plasm, and a re-evaluation of its potential is necessary.

Lines 1752 and 1604 will again be placed in replicated test plots. They have been derived from a cross of 190

(*Continued next page*)

Oregon Synthetic 1 Carrot Released for Observation

The Oregon Synthetic (Syn.) 1 carrot is being released for observation and hybridization by carrot breeders. This seed is being made available for such purposes with the understanding that no increase of the seed be made for commercial purposes at this time.

Background

The Ore. Syn. 1 line has been developed from Campbell Soup carrot DC 112-B-26-B, Code 12, made available to us in 1964. Inbred lines, selected for high color, crack resistance, smoothness, various shapes, and possible tolerance to motley dwarf, have been grown in the field (roots) and in the greenhouse (seed) since 1965. In the greenhouse, spring 1970, sufficient seed of a synthetic of four inbred lines was secured for the current release. The four inbreds, with brief descriptions, follow:

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Bush Beans . . .

Table 1. Bush green pod bean yields and grades, Corvallis (Early planting—May 4, 1970)

Line	Beans in Sieve Sizes 1–3	4	5	6	7 and over	Yield
	%	%	%	%	%	T/A
1752-2	23.7	34.0	27.4	14.1	0.8	3.9
58NZ-2	13.5	14.6	16.7	29.2	26.0	3.2
58-30	12.9	14.8	19.4	39.4	13.5	2.6
58-110	19.1	25.1	19.1	25.7	11.0	3.1
190-9	17.9	17.3	35.5	25.9	3.4	4.3
190-15	30.8	23.9	23.9	18.9	2.5	3.0
190-17	17.0	25.2	35.7	20.4	1.7	4.4
1597	23.4	15.2	25.0	27.7	8.7	2.9
2217	17.6	18.9	34.4	25.0	4.1	3.7
2150	25.6	16.1	18.4	22.0	17.9	3.3
1604	13.1	15.9	30.3	34.0	6.7	6.5
997-4	27.0	20.4	21.4	21.4	9.8	4.3
1578	29.2	12.4	13.7	20.8	23.9	3.5
1627	19.5	7.9	11.2	24.1	37.3	3.6
2368	47.8	7.6	6.5	17.4	20.7	1.5
US9C10	22.8	14.8	28.6	29.6	4.2	2.7
Ida 276-1	9.1	13.7	35.5	38.6	3.1	2.9
E. Gallatin	21.3	9.0	27.1	38.1	4.5	2.3
Ida 121-15-3	29.5	10.5	14.7	28.4	16.9	1.5
LSD 20:1						1.1
LSD 100:1						1.4

Table 2. Bush green pod bean yields and grades, Corvallis (Late planting—June 25, 1970)

Line	Beans in Sieve Sizes 1–3	4	5	6	7 and over	Yield
	%	%	%	%	%	T/A
1752-2	20.6	31.6	33.8	11.5	2.5	7.8
58NZ-2	14.4	16.8	26.5	31.5	10.8	8.2
58-30	14.8	17.9	26.4	28.0	12.9	8.2
58-110	17.9	20.5	26.9	26.4	8.3	6.2
190-9	24.6	33.1	29.0	11.5	1.8	7.3
190-15	26.6	35.0	27.3	9.4	1.7	7.0
190-17	22.9	35.7	29.8	10.8	0.8	9.0
1597	20.8	25.7	32.5	16.7	4.3	7.3
2217	22.9	26.2	28.7	18.7	3.5	6.8
2150	27.5	22.4	26.3	18.0	5.8	6.1
1604	21.4	27.2	31.5	17.5	2.4	9.4
997-4	18.8	20.1	31.2	24.5	5.4	8.8
1578	22.6	23.8	31.5	18.8	3.3	7.4
1627	20.5	21.2	28.4	25.3	4.6	7.8
2368	19.3	20.9	24.8	22.6	12.4	7.1
US9C10	22.6	29.3	36.2	10.5	1.4	7.0
Ida 276-1	21.4	32.5	35.4	9.5	1.2	6.1
E. Gallatin	23.2	33.9	36.1	5.5	1.3	6.7
Ida 121-15-3	18.2	19.6	49.0	12.2	1.0	5.2
LSD 20:1						1.3
LSD 100:1						1.8

x 58. The yield potential of 1604 was especially promising in 1970; two or three years of testing are a far better basis, however, for determination of yield potentials of new lines.

Several new promising lines of the backcross (190 x 58) x 58 will be tested in 1971. In these lines we are selecting for the fairly good growth habit of 58, but with pod sizes considerably smaller.

All of the new lines are screened carefully for processing characteristics. In general we are now working with lines which have the excellent tenderness, taste, and color characteristic of Blue Lake. One of the most elusive characteristics is firm pod texture, yet most of the lines have been rated very satisfactory in panel tests.

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Oregon Vegetable Digest is published four times a year by the Agricultural Experiment Station, Oregon State University, Corvallis, G. Burton Wood, Director. Address correspondence to the author concerned or to the Department of Horticulture.

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Chemical Control of Cutworms Tested for Vegetables

Cutworms are often serious pests in the production of vegetable crops in the Willamette Valley. Economically damaging populations do not occur every season, and this results in confusion regarding the necessity to apply yearly preventative treatments to control these pests.

The most important species which attacks vegetables is the variegated cutworm, *Peridroma saucia*, although other species such as the black cutworm, *Agrotis ipsilon*, the olive green cutworm, *Neuria procincta*, and the yellow-striped army worm, *Prodenia ornithogalli*, are often present and may cause serious injury to vegetables.

Depending on the type of plants attacked, the variegated cutworm will feed underground, at the surface of the soil, or on developing buds and foliage. In its early stages of development, this species typically feeds above ground on stems and foliage, but in later developmental stages it readily attacks underground portions of plants.

Life history

The life history of the variegated cutworm varies in different localities, depending primarily on the soil temperature. There are two generations each year in Oregon, and possibly a partial third. This species overwinters in the soil or under plant debris as half-grown larvae. The larvae begin feeding in early spring and do considerable damage to young seedlings. The larvae mature in late March and April, pupate in earthen cells, and emerge as adult moths during April, May, and June. The moths deposit eggs in clusters on the undersides of leaves. Larvae from these eggs form the summer generation, which causes serious damage during late June, July, and early August. The summer generation of larvae pupate in late July and early August and emerge as adults in late August and September. The moths deposit eggs that hatch into larvae which begin feeding and produce the half-grown larvae which overwinter in the soil.

Control

Cutworms are more easily controlled when they are small and feeding on seedling plants. Therefore, fields should be observed regularly when crops are young so that control measures can be applied against young larvae.

Several insecticides which are registered for use on vegetables to control cutworms, are summarized in Table 1.

Experimental studies

Interest in using insecticide baits to control cutworms on vegetables is increasing. In 1970, we conducted laboratory and field experiments to evaluate several insecticides formulated as baits against these pests. Most of these materials are experimental and cannot be recommended, since all pesticides must be registered by appropriate state and federal agencies prior to their release.

Results of the laboratory experiment (Table 2) indicate that several insecticides formulated as baits are effective against fifth instar (maturing) variegated cutworm

Table 2. Efficacy of selected insecticides formulated in baits against variegated cutworm larvae in the laboratory after 48 hours

Bait treatment	Total no. larvae (6 reps) Alive	Moribund	Dead	Dead	Moribund plus dead
				%	%
N-2596 (4%)[1]	0	5	25	83.3	100.0
Bacillus (6.7%)[1]	1	4	25	83.3	96.6
Dyfonate (4%)[1]	1	8	21	70.0	96.6
Dylox (5%)[1,3]	1	2	12	60.0	93.3
Lannate (1%)[1]	3	16	11	36.6	90.0
Biothion (2%)[1]	3	16	11	36.6	90.0
Sevin (5%)[2]	4	4	22	73.3	86.6
Dylox (5%)[2]	4	8	18	60.0	86.6
Gardona (5%)[2]	11	5	15	50.0	66.6
Methoxychlor (5%)[2]	29	1	0	0.0	3.3
Check	30	0	0	0.0	0.0

[1] Formulated by manufacturer.
[2] Formulated on mill-run wheat bran.
[3] Tested in one experiment only.

Table 1. Insecticides registered for cutworm control on vegetables.[1]

Control	Method of application	Rate	Vegetables
		(*AI/acre*)	
Dibrom	Contact foliar spray	2.0	Beans, broccoli, Brussels sprouts, cabbage, cauliflower, celery, cucumbers, lettuce, melons, mustard greens, peas, spinach, squash, tomatoes, and turnip greens
Dylox	Contact foliar spray	1.0	Brussels sprouts, cabbage, collards, corn, lettuce, and tomatoes
Dylox	Contact foliar spray	1.5	Beans, beets, carrots, cauliflower, kale, lima beans, rutabagas, and turnips
Dylox	Soil treatment granular	2.0	Corn *only*
Diazinon	Soil treatment granular	2-4	*All of above* plus onions, parsley, parsnips, potatoes, radishes, and swiss chard
Sevin	Bait (5%)	1-2	*All of above* except celery, mustard greens, and onions

[1] Refer to the *Oregon Insect Control Handbook* for tolererances and intervals between last application and harvest.

Cutworm Control . . .

larvae. Of the baits tested, N-2596, *Bacillus thuringiensis*, Dyfonate, and Dylox gave excellent control, followed by Lannate, Biothion, and Sevin. Gardona and methoxychlor were least effective in these tests.

A field experiment was conducted to determine the effectiveness of selected insecticidal baits and sprays against variegated cutworm larvae. Corrugated aluminum barrier strips, such as the ones used for "edging" lawns and flower gardens, were cut into lengths and looped into circles enclosing about 144 square inches. Two barriers were placed at random in each plot of seedling beans (7 x 6 feet or 42 square feet) and infested with five, fourth instar cutworm larvae immediately after treatment as follows: six different bait preparations were broadcast by hand (one treatment per plot) at the rate of 50 pounds of bait per acre (Table 3). Three wettable powder insecticides were applied with a compressed air hand sprayer (one treatment per plot) at the rate of 2 pounds AI per acre (Table 3).

Results of the field experiment (Table 3) indicate that N-2596, Lannate, Biothion, Dylox, and Dyfonate gave good control, followed by Sevin, Gardona, and *Bacillus*. Methoxychlor was ineffective in this experiment.

Of the insecticidal baits evaluated in the laboratory and field, N-2596, Lannate, Dyfonate, Dylox, Biothion, and *Bacillus* show the greatest promise against variegated cutworm larvae. Sevin was more effective than Gardona and methoxychlor as a bait in the laboratory and as a foliar treatment in the field.

Table 3. Efficacy of selected insecticides formulated as baits and sprays against variegated cutworm larvae in the field

Treatment	Total no. larvae after 7 days				
	Alive	Moribund	Dead	Missing	Control
					%
N-2596 (4%)	2	1	7	0	80.0
Lannate (1%)	2	4	4	0	80.0
Biothion (2%)	2	1	5	2	60.0
Dylox (5%)	3	2	4	1	60.0
Dyfonate (4%)	3	4	2	1	60.0
Sevin (50 WP)	4	3	1	2	40.0
Gardona (50 WP)	4	1	2	3	30.0
Bacillus (6.7%)	3	3	0	4	30.0
Methoxychlor (50 WP)	8	0	0	2	0.0
Check	7	0	0	3	0.0

—Ralph Berry and H. H. Crowell
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Synthetic 1 Carrot . . .

26-2. Slightly longer, smoother than other lines. Highest rating for past three years as a raw carrot for possible multiple processing use; after processing (canning, freezing) considered rather dark.

20-3. More tolerant to motley dwarf than other lines in 1969 but only fair for tolerance in 1970. More seedling vigor than other lines, but too prone to seed stalk formation first year.

55, 125. A somewhat smaller root line than others; less color; more resistant to seed stalk formation.

69, 176. Shorter, blockier, semi-Chantenay type; less bolting; some roots questionable because of dull orange color.

All of the lines have rather good resistance to cracking compared to most carrot varieties. A few hybrids of these lines have been tested from time to time, especially combinations involving the long-rooted Michigan State materials. These combinations have been rated high for raw and processed appearance and seedling vigor.

Bolting is a questionable characteristic in the synthetic. Seedsmen who may be able to observe the line under conditions of severe seed stalk formation, and who are able to save seed from selected resistant roots, have been asked to furnish us with samples of such seed.

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New Edible-Pod Pea Variety Released

The Oregon Agricultural Experiment Station recently announced the naming and release of an enation mosaic resistant edible-pod pea variety, 'Oregon Sugarpod.'

Primarily developed for home, market, or processing use in western Oregon where resistance to enation mosaic virus is essential for satisfactory pea production, this variety, because of its shorter plant and large pods, should be tested in other areas.

'Oregon Sugarpod,' formerly OSU S158-1, was derived from the cross OSU 102 x 'Dwarf Gray Sugar' made in 1960. OSU 102 was an enation mosaic resistant line. The original source of resistance to enation mosaic was G168, selected from P.I. 140295 by the New York Agricultural Experiment Station, Geneva, New York.

Since 1966, OSU S158-1 has been carried as a massed line. A closely related, nearly identical line, S159, was available for test a year earlier than S158-1 and furnished some of the earlier information on the acceptability of this germ plasm.

The plant of 'Oregon Sugarpod' is relatively short and sturdy, resembling that of a processing variety such as 'Dark Skin Perfection,' rather than the tall, lax plant of most edible-pod varieties. Height varies with conditions from 14 inches or less to perhaps 30 inches. At Corvallis, under good conditions, the plants reach about 24 inches in height. The stem is zigzag; the leaves and stipules are moderately large.

The node of first bloom has varied from 13 to 16, depending on location. Days from planting to edible-pod maturity at Corvallis, when planted in late May or early June, is from 55 to 60 days. The pods may be borne singly, or under good conditions there may be several sets of double pods per plant.

The pods are commonly 4 inches long x 7/8 inches wide, and are relatively smooth. Strings and traces of sidewall fiber which appear after the seed have developed are comparable to those of most edible-pod varieties. The flavor is mild and free from astringency, and the general quality is good.

'Oregon Sugarpod' is highly resistant to enation mosaic virus and moderately resistant to the pea streak virus complex occurring in western Oregon. As most commercial pea varieties, it is resistant to common Fusarium pea wilt, susceptible to Fusarium near-wilt, and susceptible to powdery mildew.

In replicated yield trials at three locations in 1970, 'Oregon Sugarpod' yielded about seven times as much as a commercial variety 'Dwarf White Sugar,' which was infected by enation mosaic. Similar yield comparisons have not been made in the absence of the virus disease. However, horticulturists in various parts of the Northwest where enation mosaic has not been present have generally reported the production, as well as the quality, to be good. Home gardeners in areas of Oregon where the virus is present have usually found the quality to be better than that of 'Dwarf White Sugar,' and the production to be definitely superior.

Stock seed has been released to producers for increase and evaluation.

—J. R. Baggett
Department of Horticulture

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Vegetable Notes . . .

A study in counteracting herbicide residue was conducted on tomato transplants by Kratky and Warren in Indiana. Root dips of tomato transplants in slurries of activated carbon provided significant but not total protection from a 1 lb/A simulated residue of atrazine in the soil. Although activated carbon slurries did not damage roots, direct contact with the foliage caused severe injury (*Hort Sci.*, 5(3):179, 1970).

Terminal bud removal from 'Jade Cross' Brussels sprouts plants was studied by Cutliffe in Canada. Total marketable single-harvest yields increased as time of disbudding was delayed and equalled those of normal plants when disbudding was delayed to the 9-whorl stage or later. Cutliffe concluded that terminal bud removal of 'Jade Cross' cannot be justified on the basis of increased single-harvest marketable yields. However, time of removal of the terminal bud affected maturity and the optimum harvest period of disbudded plants was advanced as much as 12 to 14 days. This effect of disbudding can be of assistance in obtaining earlier production or in scheduling an extended harvesting period (*Hort. Sci.*, 5(3): 176-177, 1970).