OREGON VEGETABLE Digest

VOLUME IX OREGON STATE COLLEGE, JANUARY 1960 NUMBER 1

Latest Recommendations for Symphylid Control

Horticultural Society Vegetable Highlights

The seventy-fourth meeting of the Oregon State Horticultural Society was held on the Oregon State College campus November 19--20, 1959. Cornelius Bateson, Jr., was chairman of the Vegetable Crops Section.

The vegetable program opened with a summary of what has happened in Oregon's vegetable industry during the past 100 years. Manning Becker and Andy Duncan listed these developments as highlights of the past 100 years:

1860--Only home and market gardens constituted the vegetable industry.

(Continued on page 3)

In This Issue . . .

Symphylids are considered our most important vegetable pest in the Willamette Valley. In recent years they have reduced some of our most fertile fields into marginal land. There is every indication that this trend will continue. Vegetable growers who have a symphylid problem may (1) attempt to grow a less susceptible crop, (2) try and live with the problem by the use of crop protectants, or (3) try and solve their problem with the judicious use of soil fumigants.

Normally, such crops as grains, grasses, legumes, and potatoes are not seriously damaged by symphylids. However, increasing evidence indicates that symphylids are constantly acquiring new food preferences. For example, in 1959, fall seeded wheat and oats were seriously damaged by symphylids in Washington County. Also, Malheur County reported that symphylids were responsible for severe damage to potato tubers.

Vegetable growers who attempt to escape symphylids by growing less susceptible crops should remember that the pest is not likely to disappear and will be a problem if the soil is again used for vegetable production.

(Continued next page)

Symphylid Control . . .(Continued from page 1)

After three years of experimental work, parathion was recommended at the rate of five pounds toxicant per acre as a crop protectant in order that vegetable growers could live with their symphylid problem (see OSC Circular of Information 574). Many growers, using the material as directed, report that it has not given adequate crop protection. Others have been satisfied with results, but after using parathion on the same fields for five and six years, have not measurably reduced their symphylid populations. Accordingly, they have paid tribute to symphylids to the extent of over $100 per acre and have not alleviated their problem.

Experiments at Oregon State College and elsewhere have shown that with careful planning good symphylid control can be accomplished with soil fumigants, provided they are properly timed and applied with adequate equipment in a well-prepared seedbed below the level of symphylid concentration in the soil. This practice is admittedly difficult and costly. However, considering all factors, it is the best approach to a difficult problem.

During the spring of 1959, some Oregon growers ignored the importance of timing in applying soil fumigants for symphylid control. Spring is not the time to apply fumigants for this purpose. In addition, seedbeds were not well prepared and inadequate dosages of the fumigants were used. Results were unsatisfactory in all instances.

Many Oregon growers are reluctant to accept soil fumigation practices as their solution to the symphylid problem and prefer to wait for the development of newer chemicals. These are constantly appearing on the market and are being evaluated. Unfortunately, some of them have been prematurely promoted for symphylid control. It should be remembered that there are increasing restrictions being placed on the use of agricultural chemicals for pest control. Considerable time will be needed before any new materials, promising or otherwise, can be approved and registered for symphylid control.

At present, soil fumigants recommended for symphylid control include D-D Mixture (30 gal.), Telone (30 gal.), 50% Nemagon (5 gal.), Vapam (20 gal.), and 85% ethylene dibromide (10 gal.) per acre. Instructions for applying them are found in OSC Circular of Information 574 and in the 1959 Oregon Insect Control Handbook.

--H. E. Morrison
Entomology Department

▲▲▲

Oregon's Vegetable Digest is published four times a year by the Agricultural Experiment Station, Oregon State College, Corvallis. F. E. Price, Director. Address correspondence to the author concerned or to the Department of Horticulture.

Highlights . . .(Continued from page 1)

1863--Morrell Act passed by Congress.

1868--Oregon State College founded (Agricultural College at first).

1870--Establishment of first research farm.

1873--Fish canneries started--the first Oregon processors.

1883--First railroad into Portland.

1887--Railroad connected Portland to California.

1890--Horticulture Department established at OSC.

1896--Rural free delivery inaugurated in U. S.

1900--Hermiston and Milton-Freewater irrigation projects established.

1907--Prof. A. G. B. Bouquet came to Oregon; established irrigation trials.

1908--Model-T cars.

1910--Eugene Fruit Growers established.

1911--Extension Service started in Oregon.

1912--Winter broccoli shipped from Roseburg.

1919--Food Technology Department established at OSC.

1920--Beginning era of cooperative processing.

1923--First Blue Lake beans processed by Eugene Fruit Growers.

1924--60 per cent of value of vegetables grown in Oregon was still in home gardens.

1929--The first 1-pound package of frozen food was perfected.

1932--First carload of peas shipped from Northwest.

1945-60--Era of new technology--pesticides, herbicides, aluminum pipe, nitrogen fertilizer, placement of phosphates, etc.

They presented these figures for vegetable farms and acreages in the period 1930-1955.

1930--12,000 growers - 18,000 acres.
1940--9,000 growers - 43,000 acres.
1950--7,000 growers - 91,000 acres.
1955--5,300 growers - 95,000 acres.

(Continued page 9)

Blue Lake Varieties and Strains

Yield data and other notes on Blue Lake varieties and strains for the 1959 season are shown in Tables 1, 2, 3, 4. Eleven OSC selections of pole beans are compared to FM-1 in a well replicated yield test at Corvallis. Certain other comparisons were made at Eugene by Eugene Fruit Growers and at Salem by California Packing Corporation.

In Table 1, it is noted that high yield of a variety does not necessarily mean high returns to the grower. Line 2247, for example, was the heaviest yielding of the various varieties. Yet it was one of the lowest ranking for net return in dollars, above picking cost. The pods of this line develop relatively large diameter in a short time and, when picked at the same interval as other varieties, grade out a high percentage of large sieve sizes.

OSC line 2244 gave the best performance in this test. OSC line 1188 also performed well, but is considered slightly heavy-leaved at the base and a little too rough to be of distinct promise. OSC line 284 again performed well. In Table 3, this line is compared, in various locations for the past two years, with FM-1. The yield advantage, though moderate, is consistent enough to warrant preliminary seed increase for pilot trial by growers and processors. This line also performed well in the pole bean harvester tests at Vancouver according to reports from Dr. Crandall and others associated with the project.

One word of caution is in order. This line germinates rapidly and seems to get a "running start" over FM-1. The comparisons have been made with FM-1 seed grown in California and 284 seed grown in Oregon. There is a chance that hard seed coat troubles may account for some or all of the yield differential. The OSC 2244 line also merits seed increase, along with 1484 and 1489. The latter two lines do not appear to have yield advantages, yet possess distinct dark green pods and growth habits--like 284 and 2244--which are sufficiently different from FM-1 to merit further trial.

The 2247 line, though heavy yielding, does not possess pod or vine characters which would merit commercial usage. The line may be of value for further hybridization with other higher yielding lines so that we may continue to increase our chances for combining heavier yielding ability into new types of Blue Lakes.

Parentages of the four lines being increased are shown in Table 4. None of these lines should be considered as possessing extreme uniformity for pod type, yet panels of industry representatives, as well as OSC personnel, have given them good ratings for quality of processed samples. Seedsmen may find it possible to develop sub-lines of promise from these OSC lines.

In Table 5, notes are given on certain new lines from seedsmen as well as on various OSC lines.

--W. A. Frazier
Horticulture Department

--W. A. Sistrunk
Food Technology Department

(Continued page 5)

Blue Lakes . . . (Continued from page 4)

Table 1
Blue Lake Pole Bean Yields
Corvallis, 1952[2]

Variety	Cumulative yield in tons per acre by harvest date July 23	July 27	July 31	Aug. 3	Aug. 10	Aug. 14	Aug. 19	Aug. 26[1] and total	Dollar gross[3] value	Net value above $60 per ton harvest cost
OSC 284	1.3	3.1	4.0	5.6	8.7	9.2	10.3	11.6	1352	656
FM-1	0.3	1.4	2.2	3.3	6.0	6.6	8.4	10.4	1264	640
OSC 637	2.3	4.3	4.8	5.9	7.2	7.4	8.0	8.5	961	451
OSC 1188	0.9	3.5	4.3	6.0	8.9	9.4	10.6	11.2	1383	711
OSC 1479	1.1	3.0	3.7	5.0	7.7	8.4	9.7	11.1	1332	666
OSC 1484	1.1	2.8	3.3	4.7	7.2	7.7	8.6	10.5	1209	579
OSC 1489	1.3	3.2	3.9	5.3	8.0	8.4	9.7	11.2	1306	634
OSC 1652	1.7	3.8	4.4	5.4	7.5	8.0	9.1	9.9	1154	560
OSC 1654	0.6	2.4	3.3	4.9	7.8	8.6	9.7	11.5	1319	629
OSC 1764	0.7	2.8	3.6	4.6	7.4	7.8	8.9	10.2	1206	594
OSC 2244	1.3	3.2	4.0	5.2	8.2	8.8	10.1	11.7	1444	742
OSC 2247	0.9	2.2	2.9	5.0	9.0	9.6	10.4	12.3	1238	500

(1) Least significant difference, odds 20:1 = 1.0 T; odds 100:1 = 1.3 T.

(2) Planted May 13, 1959. Fertilized with 400 lbs. per acre of 11-48-0 at time of planting in a band 2" to side of seed and 3" deep. Single row plots 25 feet long, replicated 5 times. Thinned to uniform stand of 4 plants per foot.

(3) Based on arbitrary value of $155 for sieve sizes 1, 2, 3; $145 for sieve size 4; $102.50 for sieve size 5; and $67.50 for sieve size 6; $1 for 7 and over.

(Continued on page 6)

Vegetable Note

J. H. Ellison and D. F. Scheer of Rutgers University reported yielding ability of individual male and female asparagus plants is significantly correlated with brush vigor in the preceding year. They suggest that breeders and seed producers use this factor as a basis of earlier elimination of potentially low-yielding plants. (Proc. Amer. Soc. Hort. Sci. Vol. 73, 1959.)

Blue Lakes . . . (Continued from page 5)

Table 2
Blue Lake Pole Bean Yields
Corvallis, 1959

	Per cent beans in various sieve sizes					
Variety	1&2	3	4	5	6	7 & Over
284	9.6	18.4	24.1	29.0	14.6	4.3
FM-1	11.7	19.5	23.8	29.6	12.3	3.1
637	7.8	15.9	22.5	33.2	15.4	5.2
1188	12.1	20.6	25.7	26.8	10.9	3.9
1479	9.1	17.9	25.7	31.2	12.0	4.1
1484	8.0	17.0	23.8	30.4	16.5	4.3
1489	9.5	17.2	23.3	30.0	15.1	4.9
1652	8.3	16.3	22.6	31.5	17.2	0.4
1654	11.2	16.1	23.7	27.3	16.4	5.3
1764	9.8	19.6	25.2	29.2	12.1	4.1
2244	10.6	20.6	28.2	24.6	11.8	4.0
2247	6.6	12.4	18.0	30.5	22.0	10.5

(Continued on page 7)

Vegetable Note

Abstracts of papers presented at the 1959 Meeting of the American Society for Horticulture Science:

Sixty-eight varieties and strains of table beets were field grown during 1957 and 1958 under boron deficient conditions. A range of from 0 to 76% of the roots inspected were affected by black rot, depending on the seed source. The same varieties and strains were seeded in low-boron nutrient cultures to determine their susceptibility to boron deficiency in the seedling stage. There was no apparent correlation between the behavior of seedlings and mature beet roots in response to low boron. The strain which was most resistant to boron deficiency in the field was significantly more sensitive to low boron in the seedling stage than the strain which was the most susceptible in the field.

Various nutrient relationships, as evidenced by leaf tissue analyses, were investigated in an attempt to explain the nature of the differences in response to low boron. Efficiency of utilization, rather than uptake of boron, appears to be most important factor in this respect. This information was prepared by John F. Kelly and Warren H. Gabelman of the University of Wisconsin.

Blue Lakes . . .(Continued from page 6)

Table 3
Yields of FM-1 and 284 in Different Locations--1958,1959

Place	Year	Variety FM-1	284
Corvallis	1959	10.4	11.6
Eugene	1959	*	12.0
Salem	1959	8.5	9.1
Corvallis	1958	9.9	11.1
Salem	1958	11.3	12.5
Hillsboro	1958	9.9	11.7

*FM-1 strains yielded: FM-1D, 11.5 tons; FM-1F, 11.2 tons; FM-L1, 12 tons; FM-8, 11.5 tons; FM-14, 11.9 tons; FM-P2, 12.6 tons; FM1-P, 11.1 tons.

Table 4
Pole Bean Lines for Preliminary Seed Increase

OSC Line	Parentage and Previous Selection
284	(134) Asgrow 231 x FM65
1484	(566) (104) FM-1 selection x FM65 mosaic resistant selection
1489	(584) (104) FM-1 selection x FM65 mosaic resistant selection
2244	(1671) (464) (312) FM-1P x OSC 135 (Asgrow 231x FM65 mosaic resistant selection)

(Continued on page 8)

Vegetable Note

Fast electron irradiation was effective in controlling sprouting and rooting of onions only when it was directed onto the base of the bulbs. This would create a serious mechanical problem of handling in a commercial operation. Gamma irradiation of 12,000 rep completely inhibited rooting and external sprouting and greatly reduced the occurrence of internal sprouts. This dosage was also effective on bulk units up to 50 pounds, where the package rotated 180^{o} at the half-time of 20 hours.

A high correlation existed, with both types of irradiation, between sprout control and the development of dark growth centers. Apparently irradiation injured the meristematic tissue causing it to die and gradually turn dark. No consistent effect of irradiation at the levels required for sprout control was found on the amount of decay that developed in storage. This information was reported by S. L. Dallyn and R. L. Sawyer, Long Island Vegetable Research Farm, Riverhead, New York.

Blue Lakes . . . (Continued from page 7)

Table 5
Notes on New Blue Lake Strains or Varieties--1959

A. Strains of FM-1	
FM1-M14	Early. Yield potential looks good. Tendency for oval pods at base. FM-1 growth habit.
FM-1L-1	Appears to be slightly smaller diameter than FM-1. FM-1 growth habit. Close to FM-1 maturity. Color better than 1P.
FM-1-1D	Considerable basal pod set. Appears slightly lighter in color than FM-1. Vigor fair.
FM-1(Lot 7023)	A typical FM-1 line.
FM-1-M8	Heavy basal pod set. Approximate FM1 maturity or slightly earlier. Round, typical FM1 pod.
FM-1-P2	A good early 1P line. Color slightly lighter than FM-1.
B. Breeding Lines	
Asgrow 7	Heavy, basal leaves. Medium long, dark green pod. Medium maturity.
Asgrow 14	Heavy basal leaves. Dark green, long pod. Medium to slightly late maturity.
Asgrow 21	Heavy basal leaves. Long, medium green pod. Somewhat late.
OSC 284	Early growth more rapid than FM-1, slightly heavier foliage than FM-1. Yield good. Maturity close to FM-1, or earlier. Some variability for pod type. To be increased.
OSC 1489	Slightly heavier basal growth than FM-1. Pods dark green. Some variability for color; some ovals. Maturity close to FM-1. To be increased.
OSC 1484	Growth habit rather similar to 1489. Slightly heavier base than FM-1. Pods dark green, round. To be increased.
OSC 2244	Rather early line; pods slightly shorter than FM-1; straight pods; good pod set. Yield good. To be increased.
OSC 2247	Derived from a Columbia X FM-1 cross. Rather vigorous. Somewhat heavy base, although less than Columbia. Pods longer than FM-1. Pods rather light in color. Long racemes, especially at top of plant. Yield good. Pods develop large size rapidly.

(Continued on page 9)

Blue Lakes . . . (Continued from page 8)

OSC 1657	Better than average vigor. Base slightly heavier than FM-1; yield appears good; pods tend to slight oval.
OSC 1674	A wax pod; early; round to oval. Tender. Holds quality well, but tends to stay green until about 4 sieve.

▲ ▲ ▲

Highlights . . . (Continued from page 3)

In 1930, there were 10,000 tons of vegetables processed in Oregon. In 1955, there were 250,000 tons processed here.

In the closing meeting of the vegetable crops section Becker and Duncan peered cautiously into the future. They considered the following possible developments:

1. By 1975, a U. S. population of 200 to 225 million; an Oregon population of 2.4 to 2.8 million; a west coast population of 25 to 30 million.
2. 17% more vegetables eaten per capita; vegetable consumption up 50% by 1975.
3. Distance will remain a major marketing problem.
4. Probable further integration of industry.
5. Fewer buyers of vegetables; keener competition from other areas.
6. Fewer kinds of vegetables on each farm--more specialization.
7. Increase in custom tillage, spraying, harvesting, hauling.
8. Improved sampling, grading, inspection of vegetable products.
9. Fewer, more standardized varieties.
10. Automation.
11. New methods of preservation.
12. More ready-to-eat products.
13. More variation in kinds of vegetable products (recipes) on the retail market.
14. Improved herbicides; biological control of insects; improved fungicides.

Highlights of some of the other talks will be given in the next issue of Vegetable Digest. For complete coverage of papers, join the Society and receive the annual report. Dues are $3 per year and should be sent to C. O. Rawlings, Secretary, OSC, Corvallis, Oregon.

▲ ▲ ▲

Granular Insecticides

In recent years, the use of granular insecticides for pest control has been increasing. Credit for this development should be shared jointly by agricultural chemical industries, manufacturers of improved or "precision" application equipment, and by research and extension entomologists of various states.

A modification in the use of granular materials consists of "in row" applications at the time of planting. Good results have been obtained in this way be using organic phosphate materials for control of onion maggots which have developed a resistance to most of the chlorinated hydrocarbon insecticides.

Since seed treatments and total soil treatments have found their place in control of certain soil pests, there is little doubt that "in row" uses of granular materials will also find their place. However, in Oregon there are several instances where crops have been injured by the use of granular insecticides in the row. For this reason, Diazinon will be withdrawn from Oregon's onion maggot recommendations. Trithion, Ethion, and Guthion granular formulations have been satisfactory for onion maggot control, caused no plant injury, and accordingly, will be recommended for use in 1960.

Near Eugene, in 1959, both Trithion and aldrin granules, at the rate of one pound toxicant per acre, in the row at the time of seeding produced a peculiar cracking in mature table beets. The damage in the aldrin treated row was most serious and beets could not be processed.

Crop damage by "in row" applications of granular materials is likely to vary with crops, seasons, and other factors. However, the damage is probably closely associated with the concentration of the formulation (toxicant, carrier, and solvent) about the seed and seedling. A rate of one pound toxicant per acre in the row can be expressed in terms of from 145 to 170 ppm about the tender seedling. In contrast, a broadcast application of 10 pounds toxicant per 6-inch acre would be expressed as 5 ppm.

Accordingly, growers are advised to exercise caution in the use "in row" applications of granular insecticides and to wait until materials can be demonstrated to be of value for pest control and can be registered for use on specific crops.

--H. E. Morrison
Entomology Department

▲ ▲ ▲

Influence of Moisture and Nitrogen Levels on Percent Seed and Fiber of Pole Snap Beans

The application of water by irrigation is very important in the production of pole snap beans. Because of the heavy foliage and heavy bean pod production the amount and frequency of water application during the harvesting period readily affect size and length of pods as well as shape. In addition, the percentages of seed and fiber are higher when the moisture supply is low.

Since sieve size is used as the principal means of separating quality of fresh bean pods, moisture markedly influences quality of the final canned and frozen product.

The occasional periods of hot weather that occur during the harvesting period for pole beans in the Willamette Valley increase the percentages of seed and fiber. Many bean processors experienced this during the 1958 season.

A preliminary experiment in 1959 showed that the percent of seed was much higher in pods of FM-1 pole beans that received only three water applications (Table 1). The experiment consisted of three nitrogen levels and five moisture levels in a randomized block design. Both sieve sizes 3 and 5 beans showed higher seed percentages when grown under the low level of moisture, but size 5 beans were higher in percent seed even with six water applications as compared to seven. Similar results were found in the percent of fiber for both sieve sizes.

It appears that the M2 treatment (Table 1) retarded the normal development in size of pods only in size 5 beans, in which case the percentages of seed and fiber were greater than in treatments M3, M4, and M5.

There were no major differences in percentages of seed and fiber as a result of nitrogen levels. Also, no differences were noted in percentages of seed and fiber in beans from plots that received seven and eight applications of water.

These preliminary results indicate that the frequency of water application can directly affect quality by increasing the percentages of fiber and seed in the bean pods. Proper moisture levels should be maintained in order to assure high quality pole beans.

--William A. Sistrunk
Food and Dairy Technology Department

--Harry J. Mack
Horticulture Department

(Continued page 12)

Pole Snap Beans . . . (Continued from page 11)

Table 1
Effect of Nitrogen Level and Moisture Level on the Fiber Content and Percent Seed in Pole Snap Beans

Treatment	Percent seed		Percent fiber	
	Sieve 3	Sieve 5	Sieve 3	Sieve 5
M1N1	5.40	6.82	.1656	.1608
M1N2	5.27	5.02	.1766	.1583
M1N3	8.48	7.90	.2119	.1673
M2N1	1.57	4.57	.0258	.1253
M2N2	1.79	5.80	.0200	.1436
M2N3	1.86	3.91	.0500	.1172
M3N1	2.87	2.54	.0296	.0324
M3N2	1.66	3.93	.0285	.0634
M3N3	1.65	3.31	.0399	.0502
M4N1	1.82	3.35	.0334	.0320
M4N2	1.85	3.68	.0235	.0194
M4N3	1.56	2.64	.0361	.0272
M5N1	1.52	3.81	.0239	.0472
M5N2	1.42	2.78	.0228	.0384
M5N3	1.70	2.86	.0320	.0230

N1 - 50 lbs. N
N2 - 100 lbs. N
N3 - 150 lbs. N

	Number of water applications	Total water supplied
M1	3	8.5 inches
M2	6)	13.5 to 16 inches
M3	7)	
M4	7)	
M5	8)	

▲▲▲

Vegetable Note

Thirteen varieties of sweet corn were harvested in 1957 and 1958 at regular intervals between 80% and 67% moisture. Soluble solids measurements showed that a single regression line can be used to predict the maturity for all varieties tested. Once the stage of maturity is established, the tenderness can be quickly compared to standard varieties by means of a penetrometer.

The procedure, adaptable to field operations, reduces false maturity comparisons based on silking dates and eliminates variability and the lack of objectivity resulting from use of thumbnail tests. When correlated with field evaluations, the method offers experimental workers and processors a way of predicting the relative quality of a sweet corn variety prior to processing. This information was prepared by John A. Sacklin, J. H. Kyle, and Everett R. Wolford, United States Department of Agriculture, and Washington State University, Puyallup.