OREGON VEGETABLE Digest

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Summary of 1956 Symphylid Control Research

Needed: Your Suggestions

We are beginning our sixth year of publishing Oregon's Vegetable Digest. In our first issue, Director F. E. Price stated, "all departments that deal with vegetable problems will contribute to its pages. New and significant findings, here and elsewhere, will be summarized by specialists in the various fields. It is hoped that others interested in the welfare of the industry--growers, field men, processors, county extension agents, and others--will take an active part and interest in the publication. Comments and suggestions may be sent to this office."

Your comments and suggestions for improving future issues have been appreciated, and we invite further comments. Please send them to F. E. Price, Director, Agricultural Experiment Station, Oregon State College, Corvallis.

In This Issue. . .

Parathion has now been used experimentally for three years. It was registered for use as a soil treatment early this year, and now has been used commercially for at least one season. Most growers have been satisfied with its performance to date.

Parathion can be regarded as a useful, but hazardous, material and its role in symphylid control is now becoming apparent. It should be used at the rate of 5 pounds actual material per acre. Any formulation seems to be satisfactory provided it is evenly distributed over the surface and immediately worked into the top 4 to 6 inches of soil. Soil moisture appears to have little influence on its efficiency in killing symphylids.

Although parathion will kill symphylids, it is relatively short-lived in the soil. But, there appears to be a period after it has lost its toxicity when symphylids do not feed on crops grown in treated soil. No definite residual life can yet be assigned, but the overall period of protection is probably less than 3 months. This protective period is sufficient for most crops to establish a good root system and later produce normal crops. It may not, however, be sufficient time to avoid severe culling of root crops which will be sold on the fresh market.

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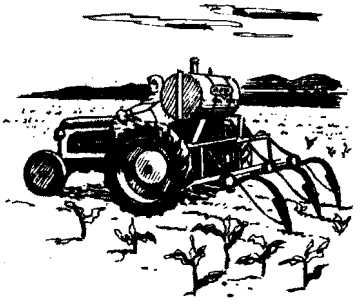
Symphylid Research . . . . . (Continued from page 1)

Studies on the distribution of symphylids in the soil show that rarely does the population in the top 6 inches of soil exceed 30 to 35 per cent of the total. This, combined with the short residual life of parathion, may explain why it has not contributed to measurable reductions in symphylid populations. Likewise, it suggests why parathion should be used each season for adequate protection and why crops should be planted soon after the soil has been treated.

New materials are promising

Field trials with new materials show that NPD, Trithion, Hercules 528, Craig 8305, and Thiodan are equal to, or better than, parathion in protecting crops from symphylid attack. Craig 7744, Diazinon, and Guthion make it possible to obtain a good stand of crops but have a shorter protective period than parathion. These materials have a lower mammalian toxicity than parathion. Efforts have been made to secure residue analyses and flavor evaluations on crops grown in treated soil.



When properly timed and applied, soil fumigants have been effective in controlling symphylids. An initial application of D-D Mixture (35 to 40 gallons per acre) has held symphylids to a low level for 9 years. More recently, ethylene dibromide, Vapam, and Nemagon have given a similar performance for 3 years. The effective dosages per acre for these fumigants have been tentatively established at 10 gallons of 85 per cent ethylene dibromide, 40 pounds (10 gallons) for Vapam, and 35 pounds (2 gallons) for Nemagon. The granular formulation of Nemagon has not been effective and requires additional work.

Many factors require careful consideration in the use of soil fumigants. The best results have been obtained when fumigants are applied in mid-July through August. Soil temperatures at this time are above 70° F., and symphylids are normally in the upper soil. If the soil is dry, it may be necessary to irrigate to induce symphylids to move into the upper soil. A well prepared seedbed (complete absence of clods) is essential, and there should be a minimum of crop residue. The fumigant should be applied below the level of symphylid concentration. If the proper conditions are met, this will be about 7 to 8 inches deep. Adequate machinery, discussed in Oregon Experiment Station Bulletin 555, is important. Immediately after the material is applied, the soil should be compressed with a float or roller and then given a water seal by light sprinkler irrigation. The lack of seedbed preparation is credited with contributing to the erratic behavior of Vapam during the 1955 and 1956 seasons. This, as well as failure to compress the soil after it was fumigated, resulted in failures with Nemagon in 1956.

--H. E. Morrison and Milton Savos
Entomology Department

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Plastic Mulches for Pole Beans?

That polyethylene plastic, used as a mulch on warm season crops such as tomatoes and melons, increased the yield of these crops was shown by experiments conducted during the 1955 growing season at O.S.C. Agricultural Experiment Station.

However, because these crops are not of economic value in this area, an experiment using polyethylene as a mulch on Blue Lake beans was decided upon. Following is a summary of this experiment.

The plots were planted with a corn jabber since it was necessary to lay the plastic first and plant through it. The jabber cut through the polyethylene readily without tearing and the seed was easily planted.

Two polyethylene films were used; 4 mil (0.004 inches thick) black, and 2 mil white. Each film was about 4 feet wide. The beans planted under plastic germinated and produced their first true leaves 3 to 5 days earlier than the nonmulched plots. However, where the black film stopped the growth of weeds, the white film which was translucent encouraged their growth. Within 3 to 4 weeks after planting the white plastic was ripped and torn by the luxuriant weed growth. The plastic was removed and discarded.

During the growing season the plants mulched with black plastic were visibily larger in height and in amount of foliage.

Harvest of the beans gave the results shown in table 1.

These data show a significant increase of 4.3 tons per acre with the use of black polyethylene, and little difference in graded-weight percentages where plastic was used. It would, therefore, seem that the use of the plastic is commercially possible.

Table 1. Effect of Plastic Mulches on Yield and Grade of Blue Lake Beans

	Non-mulched	Black polyethylene	White polyethylene
Tons per acre.....	8.98	13.28	10.91
	Graded weight per cent of total		
Cannery Grade 1.....	22.70	23.13	24.72
" " 2.....	23.18	23.90	24.22
" " 3.....	32.36	32.63	30.44
" " 4.....	16.56	15.50	15.72
Culls.....	5.20	4.98	5.29

(Continued page 4)

Plastic Mulches for Pole Beans ? . . . . (Continued from page 3)

Further consideration of the yield increase and cost of production and harvesting indicates, however, that the use of plastic mulches for processing Blue Lake beans remains questionable (table 2). For the home gardener or market grower, the use of polyethylene as a mulch for beans may be practical.

Table 2. Estimated Costs and Profits of Plastic Mulch on Pole Beans

	Gross income	Yield increase, tons per acre	Cost-to-pick increase, @ 3¢ per lb.	Estimated cost of plastic	Total cost	Net profit over nonmulched
Nonmulched.....	$ 966.40	--	--	--	--	--
Black Polyethylene..	$1,464.75	4.30	$258.00	$200.00	$458.00	$38.35
White Polyethylene..	$1,222.05	1.92	$115.20	$200.00	$315.20	- $59.55

Several factors which would change the cost remain to be considered in the use of plastic mulches for pole beans:

1. It may be possible to get an equal yield increase by using narrower plastic, thereby decreasing material cost.

2. The plastic may be picked up and reused additional years.

3. Weeding costs are greatly reduced, but this may be offset by cost of laying the material. No study of this has been made.

--V. A. Clarkson
Horticulture Department

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Vegetable Notes:

Onion neck rot is causing tremendous losses in western Oregon. In an attempt to determine the factors responsible for the sudden increase in importance of this disease, a survey of onion growers in the Willamette Valley is being conducted. Success of the survey depends upon the cooperation of all onion growers. A check list has been mailed to growers. In the interest of all onion growers, please fill in the check list and mail it to D. L. Rasmussen, County Extension Agent, Room 75 Courthouse, Salem, Oregon

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Pink root resistance of the "short day" onions Excel, L36, Eclipse, and L365 has been reported from southern Texas. No long-day, long-storage, types resistant to pink root have been released, but breeding work is underway on this problem.

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Milwaukee Meeting Report

What's New in Bean and Pea Breeding Research

The November 9 meeting of bean and pea breeders at Milwaukee, Wisconsin was well attended by seedsmen and representatives of public agencies and processing organizations. The morning session was devoted to reports and discussions on improvement of peas for processing. It was pointed out that pea yields, as contrasted to some crops, do not now average above those 30 or more years ago in some areas.

Dr. Schroeder and Dr. Barton of the New York (Geneva) Experiment Station reported on enation virus and aphanomyces root rot resistance. By the use of backcrossing, their program of incorporation of enation resistance in Shoshone, New Era, Perfection, Thomas Laxton, Pluperfect and Perfected Freezer varieties is nearing completion. This program should be of value not only to New York, but to other areas which grow peas, or in which breeding work is a necessity for the future.

Dr. Hagedorn, of the Wisconsin Experiment Station, reported on their past work with pea viruses and their present work on aphanomyces root rot. Resistance to aphanomyces has been a difficult problem in both Wisconsin and New York, but they feel progress is being made.

Dr. King, of the Minnesota Station, reported that near wilt, fusarium, and aphanomyces were present in Minnesota. He indicated that they had several lines of peas which carry good resistance to fusarium, but that aphanomyces was more difficult to breed against. Rhysiologic races (strains) of the organism have been isolated there.

Resistance to mildew was reported by the New York researchers. They feel that the simple inheritance mechanism involved may permit rapid progress in control of the disease, although there could possibly be future complications with races of this disease.

For pea breeders, a committee was appointed by the chairman, Mort Adams, to plan for a meeting in 1957. Dr. Walker, of Wisconsin, is chairman.

The afternoon session was devoted to bean breeding problems, with all of the emphasis being placed on bush beans. Dr. Atkin of the New York (Geneva) Experiment Station is hybridizing the Blue Lake pole with bush beans. Similar work is getting under way at Maryland, under the direction of Dr. Snyder. Several seedsmen as well as processors' representatives took brief part in the program. A brief report was made on work at the Oregon Experiment Station. Stress on bush bean improvement was placed on high quality white seeded types, and adaptation to mechanical harvesting. The impression gained at the meeting was that 1956 may have marked the beginning of far more rapid acceptance of the bush bean picker in the Wisconsin and New York areas. The best estimate obtained was that there would be from 150 to 200 of the machines in use in 1957, and that picking cost in 1956 in one of the larger operations was approximately 1 1/2 cents per pound.

For bean breeders, a committee was appointed to study plans for a similar meeting in 1957. Chairman is M. Mitchell, of Wisconsin.

--W. A. Frazier
Horticulture Department

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Sweet Corn Fertilizer Recommendations

Effects of fertilizer on sweet corn yields were studied during the 1956 season at Corvallis. Included in the trial were 4 nitrogen rates, 3 phosphorus rates, and 2 potassium rates. Rates of fertilizer are expressed in pounds per acre of nitrogen (N), phosphoric acid (P_2O_5), and potash (K_2O). Plots were located on a Chehalis clay loam soil with a soil test of 32 pounds P per acre and 500 pounds K per acre.

Data presented in table 1 include total and graded yields of unhusked and husked ears, number of ears per acre, and average weights of individual ears for the various treatments. These data indicate that a rate of 100 pounds of N per acre was the best rate. Although the 150- and 200-pound rates of nitrogen resulted in small yield increases over the 100-pound rate, these increases could not be considered economical. It is interesting to note that the yield increase due to additional nitrogen above 50 pounds per acre was primarily through increased number of ears produced rather than weight of individual ears. Yield increases due to banded application of phosphorus at planting were not large, although in most of our previous trials significant increases were obtained from application of phosphorus fertilizer. There was no increase in yield due to banded application of 60 pounds per acre K_2O as muriate of potash.

Fertilizer Recommendations for Sweet Corn

On the basis of previous trials as well as 1956 results, fertilizer recommendations for sweet corn grown in the Willamette Valley follow. For specific grower cases, consideration should be given to soil type, soil test (available through your County Extension Agent), the irrigation program, and previous cropping and fertilizer practices. Sufficient moisture and plant population are important as well as sufficient fertilizer to obtain maximum yields of sweet corn.

Table 1. Effect of Fertilizers on Sweet Corn Yields, Corvallis, 1956

Treatments	Yield (tons per acre)				Number of ears per acre		Average ear weight (lbs.)	
	Unhusked		Husked				Unhusked	Husked
	Total	Graded	Total	Graded	Total	Graded	Graded	Graded
50 lbs. N. (a)..	9.06	7.47	6.24	5.23	29,868	20,658	.721	.505
100 lbs. N. (a)..	10.25	8.59	7.05	6.01	33,602	24,392	.706	.493
150 lbs. N. (a)..	10.53	8.81	7.38	6.32	34,099	24,641	.713	.512
200 lbs. N. (a)..	10.78	8.83	7.38	6.19	34,846	24,641	.716	.503
100-192-0	10.25	8.59	7.05	6.01	33,602	24,392	.706	.493
100-192-60.....	9.69	8.01	6.65	5.57	31,610	22,152	.721	.502
100-0-0	10.19	8.25	6.75	5.51	34,099	23,894	.690	.461
100-60-0.....	10.24	8.49	6.92	5.85	32,854	23,396	.724	.499
100-192-0.....	10.25	8.59	7.05	6.01	33,602	24,392	.706	.493
LSD 5%	0.88	0.82				2685		.028
1%	NSD	NSD				NSD		.037

(a) Uniform application of 400(+) lbs. 11-48-0 per acre banded at planting on May 12. Additional nitrogen (N) as ammonium nitrate sidedressed on July 25 and August 4.

(Continued page 7)

New Nematode Associated With Lake Labish Onion Decline

Several areas of stunted onions were observed in the Lake Labish region during the past season. In addition to severe stunting there was noticeable injury to the root system. The affected plants had short stubby root remnants of a brown to black color in contrast to the long white roots of healthy plants.

Soil samples obtained from the root zone of affected plants contained a large population of an ecto-parasitic nematode (Trichodorus sp.). The Trichodorus spp., commonly called stubby-root nematodes, are serious pests of vegetables in the southeastern states. Since this is the first time this nematode has been associated with a plant disease in Oregon, our information is very limited. Various control measures are being investigated.

--Harold J. Jensen, Iain McSwan, Plant Pathology Department
Don Rasmussen, Marion County Extension Agent

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Sweet Corn Recommendations. . . . . (Continued from page 6)

Nitrogen - A rate of 100 pounds N per acre has been the best rate. Our data on time of application of nitrogen fertilizer are limited but indicate that time of application is not critical if about half or more of the nitrogen is applied at planting or before.

Phosphorus - Rates ranging from 60 to 120 pounds P_2O_5 per acre banded at the time of planting are recommended. A rate of 60 pounds P_2O_5 per acre may be ample on soils testing high in soil phosphorus.

Potash - No potash is recommended on soils testing 350 pounds K per acre or higher. For soils testing 150 to 250 pounds K per acre, 40 to 60 pounds K_2O per acre are recommended. Rates of 70 to 100 pounds K_2O per acre are recommended on soils testing 150 pounds K per acre or lower.

--H. J. Mack
Horticulture Department

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Vegetable Note:

From Delaware it has been reported that N-m-tolyl phthalamic acid sprayed on lima beans at the rate of 100 gallons per acre, and at a concentration of 125 parts per million, increased yields by 26 per cent. The growth regulator was most effective when applied at "full bloom," and when hot, dry weather coincided with pod set.

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