OREGON VEGETABLE Digest

VOLUME VI OREGON STATE COLLEGE NUMBER 3

View Research at OSC Vegetable Farm

Revised Insect Control Handbook Available

The Oregon County Agents' Insect Control Handbook has been completely revised and should be of special interest to farmers, processor fieldmen, representatives of chemical companies, and others interested in the control of insect pests. Copies are available at $1.50 each at the Co-op Bookstore, Memorial Union Building, Oregon State College, Corvallis.

One of the principal features of this revision is the inclusion of data pertinent to the Miller Amendment. This includes established pesticide residue tolerances (in parts per million) which are approved by the Food and Drug Administration. Additional information is also included which explains restrictions currently applicable on the use of various pesticides and the safe interval to allow between the last application and harvest.

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In This Issue...

No formal field day has been planned for 1957, but those working with vegetable crops problems have developed a list of experimental plantings with probable dates of the best times for observation, which are listed below. Growers, fieldmen, representatives of seed companies, and chemical companies, as well as others are welcome to visit the farm at any time. Because of differences in crop maturity, formal field days have permitted coverage of only part of experimental plantings at the most desirable observation time. On a trial basis, we are putting out the "welcome" sign this summer on the approximate dates indicated below for the various crops. We hope that all who are interested in a given crop or phase of research will visit us.

We would be glad to have your comments, written or verbal, on whether you prefer this system or a definite field day.

To get to the vegetable farm: Travel east on Van Buren Street. Cross the Willamette River bridge on the "old" Albany highway. Take the first road to your left (about 1/2 mile) after crossing the bridge. Continue past the plant pathology farm, on past four turns in the gravel road, until you reach the large lath house next to the hop yard. Take the road between lath house and hop yard and at the end of this road "jog" right and then left and stop by the farm buildings.

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View Research. . .

(continued from page 1)

Horticulture, Soils, Agricultural Engineering

Pole beans (about August 5)

- Fertilizer work--rate and time of application of nitrogen, placement of potash vs. broadcast application.
- Study of picking interval effect on yield and grades--intervals of 2-3, 4-5 and 7-8 days.
- Blossom and pod drop--effects of n-meta tolyl phthalamic acid (Duraset) and gibberellic acid.
- Basal defoliation--effects of Endothal and potassium cyanate on defoliation and yield of FM-1 and Asgrow 231 pole beans.
- Weed control--comparison of dinitro amine, dinitro amine plus Vegadex; EPTC.
- New varieties and breeding lines of pole green beans.
- New varieties and breeding lines of wax pole beans.
- Breeding lines carrying resistance to yellow mosaic virus.
- Effect of polyethylene mulches and differential irrigation on growth and yield.

Bush beans (about July 28)

- New varieties and breeding lines of green and wax pod types.
- Hybrid derivatives of pole and bush beans.

Table beets (about August 20)

- Boron fertilizer and control of canker--use of fertilizer borate and a "slowly available" boron material applied at planting compared to spray applications of soluble boron for control of canker.
- Weed control--EPTC at 4 and 8 pounds per acre; use of a Monsanto chemical at 8 pounds per acre.

Sweet corn (September 5-15)

- Sweet corn irrigation trial in cooperation with Departments of Soils and Agricultural Engineering; yield effects due to moisture variables.
- Weed control--effects of dinitro amine plus Vegadex and Simazin at rates of 2 and 4 pounds per acre.
- Polyethylene mulch effect on yield.
- New varieties and inbreds.

Other crops

Rhubarb--seedlings for selection for deeper red color of petioles;
Peas--resistance to enation mosaic virus (early July);
Tomatoes--selection for earliness, quality, and resistance to cracking (about September 10);
Tomatoes--polyethylene mulch effect on soil temperature and yield (after August 15);
Melons--early lines of cantaloupes and watermelons (about September 10).

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Progress Report...

1956 Onion Neck Rot Control Tests

Research work on onion neck rot control was started in February 1956, with a survey of onion growing, curing, and storage practices in the Malheur area. No definite conclusions could be drawn from the replies to a questionnaire, or from discussions with growers and warehousemen, but four possibilities seemed to be indicated:

Excessive nitrogen fertilization and irrigation, resulting in delayed maturity and large succulent necks, resulted in increased neck rot losses.

Onions frequently were not cured properly before storing.

Some storage containers did not permit adequate ventilation.

Delayed maturity due to the relatively cool seasons of 1954 and 1955 resulted in many onions being lifted and stored while the tops were still green and in a vegetative condition.

In three fields at widely separated locations in the Ontario area, onions (Sweet Spanish) were grown (a) with normal amounts of irrigation water and nitrogen fertilizer and (b) with 60 lbs. of additional nitrogen per acre as a side-dressing when the onions were approximately 10 inches high, and an additional irrigation at the end of the growing season. After lifting, the onions were cured in the field 0, 3, 6, and 9 days before topping and storage. Half the onions in each lot were dried at 115°F. for 22 hours before storing. Some onions were stored in burlap bags; others in slatted wooden crates. And to be sure there would be some neck rot, part of the onions were inoculated by dipping in a suspension of neck rot fungus spores.

Results

The first observation that must be made is that in a good growing season such as 1956, when the onions were mature and dry weather prevailed at harvest time, onions can be handled in almost any manner and still "keep" well in storage.

(Continued page 4)

View Research ...(continued from page 2)

Entomology

Residual soil insecticides have been under test since 1949. Plots are planted to potatoes. The best time to observe the results of wireworm control tests and work with other insect pests of potato tubers is during harvest in October.

Work on onion maggots is under way this year, and can be viewed most anytime this summer. At the Stegmuller farm, just west of the Horticultural farm, research on symphylid control can be observed.

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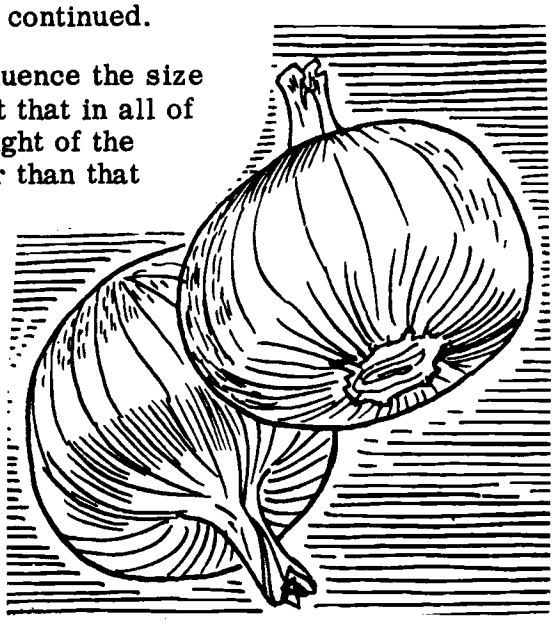
Onion Neck Rot Control ... (continued from page 3)

Excess Nitrogen and Water

In 1956 there were no significant differences between the onions grown normally and those that received extra nitrogen and water. In a cool season when onions were not fully mature at harvest it is entirely possible that differences would be shown, and for this reason the use of varying amounts of fertilizer and irrigation water will be continued.



Since the amount of fertilizer and irrigation water influence the size of onions, an indirect effect might be indicated by the fact that in all of the onions in the tests (more than 60,000) the average weight of the onions that developed neck rot--8.82 ounces--was greater than that of the onions that remained healthy--6.94 ounces. The susceptibility of onions to neck rot infection thus seems to be in direct proportion to their size. Probably a more direct correlation could be obtained by measuring the size of the neck of the onions.

Field Curing

Because all onions were mature and warm dry weather prevailed at harvest time only slight effects of field curing could be shown. Various methods and periods of field curing will be tested in 1957, using immature as well as mature onions.

Drying

Drying at 115°F. for 22 hours caused only slight losses in weight, the losses being progressively less as the period of field curing increased. Losses ranged from 1 to 2%.

Drying of uninoculated onions caused no significant difference in the amount of neck rot that developed during storage. Since 96.54% of all onions stored without drying remained healthy, not much improvement could be expected. Some 97.38% of all onions dried before storage remained healthy during the storage period. Drying of inoculated onions resulted in very significant reductions in the amount of neck rot.

Type of Storage Container

Less neck rot developed in uninoculated onions stored in slatted crates than in those stored in burlap bags. While the differences were slight they were consistent, regardless of the origin of the onions or the degree of natural or artificial curing.

In the inoculated lots, significantly less neck rot developed in the onions stored in slatted crates than in those stored in burlap bags. The differences were consistent, regardless of the origin of the onions or the degree of natural or artificial curing. Differences decreased as the period of field curing increased--a further indication that onions adequately cured will keep best in spite of the way they are handled after curing.

What This Means...

The influence of the growing season was clearly illustrated by the difference in keeping quality of onions grown in 1954 and 1955 when relatively cool weather prevailed and onions were somewhat immature at harvest time, and in 1956 when better onion growing weather prevailed and all onions were mature at harvest time. Under the latter conditions the period of curing after lifting had little influence on the keeping quality of the crop and few growers experienced significant neck rot losses.

(Continued page 5)

Onion Neck Rot Control ... (continued from page 4)

Only two factors were definitely shown to exert a significant effect on keeping quality. The decreased development of neck rot in onions stored in slatted crates, which permit better ventilation than burlap bags, was so consistent that there can be little doubt that the data are reliable even though only a single season's work is reported.

The value of artificial drying was just as convincing in those lots that had been inoculated with the neck rot fungus. Much more work is needed here, however, before any conclusions can be drawn concerning the practicability of such treatments.

Work in 1957 will be a continuation of that done in 1956. In addition, work on distinctly immature onions, on onions inoculated in the field before field curing, on time and temperature of drying, and on various methods of field curing, will be added.

--Edward K. Vaughan, Plant Pathology Department
M. G. Cropsey, Agricultural Engineering Department

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Revised Handbook ... (continued from page 1)

You may note apparent inconsistencies in these restrictions. For example, the time intervals approved for parathion vary from 5 days on potatoes, 10 days on peas, 14 days on cucumbers, and 21 days on most other crops. Some of these differences are due to the crop involved. However, the Miller Amendment has been in operation for only a short time and information on safe intervals between application and harvest for all affected crops and pesticides is far from complete.

Many revisions of these restrictions will undoubtedly be made in the next few years. In the meantime, it will be wise to adhere to those currently in effect for mutual protection of the grower, processor, and the consuming public.

Bean growers should note that TEPP is restricted to a 3-day interval between application and harvest. Although it is known that TEPP breaks down in the presence of moisture, it is such a toxic material that "no tolerance is justified," to quote the Federal Register. To be sure that no TEPP may remain on beans or other produce at harvest, the Food and Drug Administration is currently insisting on this 3-day time interval.

Malathion, a relatively safe insecticide, is restricted to a 3-day time interval in the handbook. However, since the printing of the handbook, word has been received that the U. S. Department of Agriculture has accepted a 24-hour interval between application and harvest for malathion on beans.

Other features of the handbook include supplements on the control of corn earworm, cabbage maggots, cutworms, potato aphids, and "stop-gap" measures for onion maggots. Supplements on the use of soil insecticides and precautions on the use of phosphate materials are also included. The latest information on symphylid control may be of interest. This has also been published recently in Station Circular of Information No. 574, which may be obtained from County Extension Agents.

In addition to the information on control of vegetable insects, the handbook also contains up-to-date recommendations for control of insect pests of legumes, grass seed, mint, hops, nuts, tree fruits, small fruits, ornamentals, household, and livestock.

--H. E. Morrison and H. H. Crowell
Entomology Department

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Breeding for Resistance to Bean Root Rot

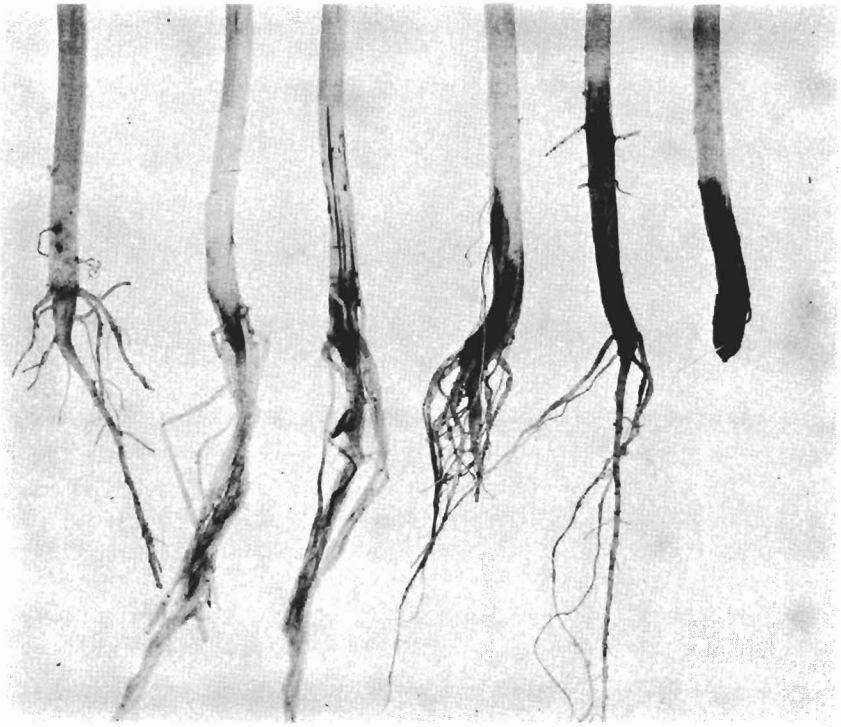
Dry root rot of beans is a disease which at present defies attempts at control by cultural or chemical means. According to E. K. Vaughan and H. W. Wiedman of the Department of Botany and Plant Pathology, who conducted basic studies on this disease in Oregon, it is caused primarily by strains of Fusarium, although other fungi may be involved. Because this fungus is present in most soils, root rot usually appears the first time beans are grown and becomes more severe with successive bean crops. Crop rotation on a short time basis is not particularly effective in reducing the occurrence of the disease, nor has an effective chemical control been developed.

The best solution to the root rot problem appears to be through resistant varieties. This aspect of the problem has been studied at Oregon State College for the past several years. The program includes variety testing and breeding. Varieties and lines of beans are collected from many sources and tested in the greenhouse with an artificially cultured strain of Fusarium.

Most varieties have been found to be very susceptible. Two lines of Black Mexican beans have shown a good degree of resistance when compared with susceptible varieties such as Blue Lake. They are not immune, but develop symptoms which are more superficial and less damaging to the root system. These varieties have been crossed with Blue Lake to incorporate a degree of resistance into this commercial variety. The inheritance of resistance in this cross has been found, in a study recently completed by Hassan Azzam, to be quite complex. Such information should be useful in planning a breeding program.

The photograph below shows the range of disease symptoms common in the offspring of the cross.

Although available breeding materials are not immune, it should be possible to develop commercial bean varieties with good degrees of tolerance to root rot infection.



Range of disease symptoms common in offspring of crosses. Right, severe symptoms typical of Blue Lake. Resistant plants usually develop symptoms similar to those in the center. Those appearing free from infection, left.

--J. R. Baggett
Horticultural Department

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Food Transporation... and what it costs

Out of every dollar you spend for food at the retail store, more than 8¢ goes for transportation. It costs 8¢ to bring farm-grown produce from the country to the wholesaler and something more to deliver it to the retailer.

Compare this with the 5.5¢ per dollar you spent for food transportation just 10 years ago and you get a picture of current transportation costs.

Of course, the price of the food itself has risen, too. And marketing is costing us an ever larger part of the food dollar. But transportation's share has been growing even faster than the share of other marketing services.

The increase in the transportation portion of your food dollar reflects a sizable increase in the total transportation bill for food. This bill is now more than 2 1/2 times what it was 10 years ago.

Why the transportation bill rose so much in such a short time is brought out in a recent study made by the Agricultural Marketing Service. Specialists in the Transportation and Facilities Branch can see three significant factors contributing to this increase:

- More food is being shipped to market to feed our growing population.
- Fresh fruits and vegetables are being hauled longer distances.
- The railroads have been granted several general rate increases in the past 10 years, and truck rates probably have increased accordingly.

Today, the housewife's pruchases of fresh produce are no longer limited to "in season" fruits and vegetables. With the increasing speed of truck and rail transportation and improvements in refrigeration techniques, fresh produce is available almost the year around. When the growing season in one producing area ends, the market draws on another area.

--G. B. Davis
Agricultural Economics Department

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Vegetable Notes:

Maleic hydrazide has been used in greenhouse experiments in Texas to encourage side branching of southern peas, Vigna sinensis. Varying concentrations of the chemical sprayed on the plants inhibited growth of the terminal growing point, and thus forced growth of lateral shoots. It is hoped that a more concentrated yield adapted to machine harvesting will result. This work was reported by F. J. Molero and H. T. Blackhurst in Volume 67 of the American Society for Horticultural Science Proceedings.

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A. E. Thompson, University of Illinois, reported in Volume 67 of the American Society for Horticultural Science that a number of spinach hybrids yielded an average of 20 and 16.3% more than the standard varieties tested in two harvest periods. Twelve unselected hybrids were studied. Two and three generations inbred lines used for hybrid production yielded as much as standard varieties.

Storage Behavior of New Onion Hybrids

Several of the new onion hybrids, grown in 1956 on the Jim Rickard farm at Lake Labish, were kept in common storage until March 19, 1957. They were compared with the Yellow Globe Danvers strain grown by Mr. Rickard.

The storage data show the greatest difference in storage ability that has been noted between Yellow Globe Danvers and various hybrids since the tests of new hybrid onion were initiated several years ago. Danvers was definitely superior to all hybrids. It was especially surprising to note the poor storage condition of Danvers Hybrid. This onion, however, matured several days earlier than the open pollinated strain of Danvers.

We do not know the reasons for such decided superiority of Danvers in storage when compared to the relatively equal storage ability of such a hybrid as Epoch in previous years. We plan to use at least two strains of Danvers grown at Labish for the 1957-58 storage data, since there may be greater differences in storage ability of these strains than we had anticipated. This, however, may or may not be the answer.

Abundance, a promising hybrid for yielding ability, was not expected to store as well as Danvers. Use of this and other promising hybrids may be considered for fall and early winter markets, so that bulbs are marketed prior to appearance of storage weaknesses.

It is obvious that, at least for the Lake Labish area, we should continue with cautious use of new hybrids.

Onion Storage Behavior. Oregon, 1956-57
(Stored until March 19, 1957)

Variety	No. Bulbs Stored	Sprouts Per cent	Rooting Per cent	Rotted Per cent	Total Loss Per cent
Abundance	329	18.2	40.1	7.3	65.6
Rickard Danvers	245	0.8	9.8	2.5	13.1
Ia467-8 x B2215	305	0.7	21.3	1.0	23.0
Asgrow H5316	232	4.7	37.0	16.4	58.1
B2267 x B2215	232	1.3	37.1	4.3	42.7
Epoch	293	8.5	43.7	3.1	55.3
Ia163 x B2215	271	2.2	25.5	1.8	29.5
B2228 x B2215	227	1.3	33.0	1.8	36.1
Surprise	169	1.7	49.1	2.3	53.1
Asg. H5313	223	2.6	23.3	2.2	28.1
B2207 x B12115	281	3.2	50.2	1.4	54.8
Danver Hybrid	302	6.3	58.6	16.6	81.5
Autumn Topper	261	1.1	46.3	1.1	48.5
Ia736 x B2215	327	2.1	19.0	8.0	29.1
RBW101 x B2215	449	0.7	19.4	4.7	24.8

--W. A. Frazier
Horticulture Department

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