OREGON VEGETABLE Digest

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Vegetable Varieties Recommended for 1969

New Chemical Reduces Bean Mold Infection

Reports from a number of state and private agencies indicate that a new chemical known as Benlate (DuPont 1991) may be of tremendous importance to the snap bean industry. Both white mold (*Sclerotinia sclerotiorum*) and grey mold (*Botrytis cinerea*) infections have been reduced drastically by one or two applications of the material at and just after full bloom stage.

Results obtained at OSU in 1968 were disappointing. In two experiments where Benlate and other commonly used fungicides were applied for comparison, there was no mold in any of the plots. In a third experiment, where only Benlate was used on beds of closely spaced (5" x 5") OSU 58 bush beans, a single application (1 pound actual per acre) at full bloom reduced white mold infections by two-thirds and grey mold infections by half. The diseases appeared late in the growing period, and the reductions were not reflected in increased yields of marketable beans.

Benlate has shown some systemic action but, like other systemic pesticides, moves only upward in the plant. To adequately protect the stems and lower pods in mass plantings, some new application methods or modifications of application equipment will be needed. Extensive testing of Benlate and other materials will be continued in 1969.

Benlate has not yet been registered for use on any food crop. Numerous tests show very low levels of residue and low mammalian toxicity.

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Every two years the Department of Horticulture prepares a list of vegetable varieties adapted to various areas of Oregon. Old and new varieties are included, with comments on some of the new ones. The list should not be considered exhaustive; there are numerous varieties of most of our common vegetable crops, and in many instances there are several strains of a given variety.

Caution is suggested in changing to new varieties without clear, compelling reasons. It is usually best to plant small trial plots or acreage at first and to repeat the tests for three years or more. Varieties will vary in behavior from year to year and from location to location. Many environmental factors such as soil, diseases, insects, temperature (night and day), solar radiation (intensity and length of day), rainfall, irrigation, various chemicals, and impacts of machinery interact with varying heredity to give a range of responses among varieties and strains.

When a strain of a given variety appears especially promising, it may be well to purchase seed a year or two in advance, indicating to the seedsman the particular stock desired.

It is difficult for any one person to keep up with new variety developments in every crop. Therefore, it may

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be well to seek information from several sources. At Oregon State University new, promising variety developments in major crops usually are noted and tests run; with other crops, suggestions are based only on experience elsewhere. Sources of information may be experienced growers, county agents, field men, seedsmen's representatives, catalogues and descriptive lists, extension specialists, and vegetable breeders at OSU.

Asparagus. Mary Washington and California 500.

Beans, green bush. Tendercrop, mottle-seeded, is now well established, especially for freezing. Gallatin 50 is an off-white seeded version of Tendercrop type. Executive and Tenderette are also of Tendercrop type.

OSU 58 bush bean is fleshy podded and shows some promise; seed quantity is limited. Tempo has shown some promise. Care should be exercised to harvest this variety at prime quality stage; it is not a large, fleshy type. 274 of Asgrow is somewhat late and heavy foliaged, with only fair concentration of set; it is a fleshy type.

Beans, green pole. For processing: FM-1K, Prime Pack (considered essentially the original FM-1 bean), FM-1L, and Asgrow 231. For eastern Oregon areas subject to curly top virus damage: Columbia, developed by the late B. F. Dana; this bean is essentially of Blue Lake quality. Other favorites of Oregon gardeners: Oregon Giant and Kentucky Wonder. Romano is a flat-pod bean with distinctive flavor.

Beans, wax bush. Puregold and Earliwax. A few OSU wax beans of complex parentage are available for use by processors in small-plot work. For eastern Oregon curly top areas, we suggest contacting Matt Silbernagel, Irrigation Experiment Station, Prosser, Washington, and Dr. L. L. Dean, Bean Research Laboratory, Twin Falls, Idaho.

Beans, lima pole. Christmas and Oregon (a white "runner" bean of scarlet runner type).

Beans, lima bush. Large pod: Fordhook 242 and Concentrated Fordhook. Small pod: Clark's Bush, Early Thorogreen, Thaxter (mildew-resistant), and Henderson.

Beets. For processing: Detroit Dark Red (mildew-resistant type). For home gardens: Green Top Bunching and Seneca Detroit.

Broccoli. Waltham 29, Northwest Waltham, and Purple Head (purple florets). Spartan Early is smaller than the Walthams but is suited for home use. Italian Green Sprouting is inferior to the varieties listed above, but it may be all that is available in some cases. Harvester is of current interest for mechanical harvesting.

Brussels sprouts. Jade Cross (early F_1 hybrid) is uniform in maturity and plant form; attractive to aphids. The sprouts are closely spaced and pressed together along the stem, and there is some tendency for sprouts at base of stem to become infected with soft rot if harvest is delayed. Fancy Most and Catskill are suited for home and market use.

Cabbage. Early and midseason: Golden Acre, Early Jersey Wakefield, Green Acre, Marion Market, Copenhagen Market, Emerald Cross, Bonanza, and Market Topper. Late: Danish Ballhead and Oregon Ballhead. Small: Babyhead. Savoy: Chieftan and Savoy King. Use strains resistant to fusarium yellows if this disease has been a problem.

Cantaloupe. Spear, Oregon Delicious, Hales Best, and Hearts of Gold are somewhat late in western Oregon. They perform best when transplanted to the field, or when plastic or paper mulches are used. Fusarium-resistant varieties (late maturing): Iroquois, Harvest Queen, Delicious 51, and Resistant Honey Rock. Gold Star, Harper Hybrid, Supermarket, Saticoy Hybrid, and Burpee Hybrid are F_1 hybrids which have done well in western Oregon. Crenshaw only in the warmer areas.

Carrot. For processing: Red Cored Chantenay, Royal Chantenay, and Nantes. For the gardener: Red Cored Chantenay will hold up longer in the fall without as much cracking and rotting as Nantes. Market garden types: Imperator, Gold Spike, Gold Pak, Chanticleer, and Morse Bunching. Hybrid carrots hold promise for the future. W-5, a new synthetic from Wisconsin, has excellent raw and frozen color and is worthy of trial; color of this carrot when canned is questionable. Michigan hybrid lot 2, 1968, has shown promise.

Cauliflower. Snowball X, Snowball Y, Early Snowball, and Snowdrift. For winter or spring types, there are a range of varieties from December to April.

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Vegetable Varieties . . .

Celery. Utah (there are many good strains of this green, long petiole type).

Corn, sweet. Jubilee, the most important commercial processing hybrid, will usually outyield Golden Cross, but both have good quality. Also for home and market: Early—North Star and Golden Beauty; midseason to late—Seneca Golden, Sugar King, and FM-Cross. Tokay Sugar (early) and Silver Queen (late) are high-quality white varieties well liked by home gardeners.

Cucumber. For pickling: MR17 (mosaic-resistant), SMR-15 (scab-mosaic-resistant), SMR-58, and other new disease-resistant varieties. Several F_1 hybrid pickling cucumbers with concentrated crown set are available and are adapted to mechanical harvest. For slicing: Burpee Hybrid, Sensation Hybrid, Surecrop Hybrid, and Marketmore. These F_1 hybrids are usually very productive; they also do well in greenhouse production. M & M Hybrid has looked especially good in greenhouses.

Eggplant. Black Magic (early F_1 hybrid), New Hampshire, Black Beauty, and Burpee Hybrid.

Lettuce, head. 456, Phoenix, Pennlake, and various Great Lakes strains.

Lettuce, leaf. Oak Leaf, Salad Bowl. Bronze Leaf (Prizehead) is exceptional. Ruby is attractive.

Lettuce, butterhead. Bibb, Summer Bibb, and Buttercrunch.

Onion. Danvers Yellow Globe (western Oregon), hybrid Surprise, and Sweet Spanish (eastern Oregon). OSU 11, a deep globe semi-Spanish Danvers, is available for trial (small packets).

Interest in small white pearl (pickling) onions warrants a review of white, short-day types that are spherical in shape and have a very thin outer scale. Barletta types such as White Pearl, White Creole, and FM-L-281 are promising when seeded early and thickly.

Peas. Canners: Perfection types and Alaska (small early). Freezers: Freezer 69, Frosty, Early Frosty, Dark Green Perfection, Midfreezer, and Jade. Market and garden: Alderman (tall), Little Marvel (dwarf), Thomas Laxton (medium tall), Progress 9, and Icer 95. Enation mosaic-resistant Perfected Freezer 60 may be available for freezing and garden. A virus-resistant OSU line is available for trial in home gardens.

Pepper: Yolo Wonder (mosaic-resistant, somewhat late), Early Calwonder, Pennwonder, Idabelle, and Michigan Wonder. For small fruit and very early: Vinedale, Early Bountiful, and Morgold (orange).

Pumpkin. New England Pie, Small Sugar, Jack O'Lantern, Connecticut Field, Dickinson; Big Max for exhibition.

Rhubarb. Valentine, MacDonald, and Riverside Giant. A few OSU hybrids are available for limited trial.

Summer squash. Zucchini, Caserta, Yellow Straightneck, Yellow Crookneck, and White Scallop. Burpee Hybrid, Storr's Green, Seneca Zucchini, and Zucchini Hybrid are exceptionally productive green varieties which are easy to pick. Blackini has open foliage and is high in quality but less productive. Seneca Butterbar is a yellow straightneck type of exceptional quality.

Winter squash. Hubbard (many types well adapted), Golden Delicious, Banana, Uconn (bush, small-fruited Table Queen), Table Queen, Sweet Meat, Buttercup, Marblehead, Butternut, and Silver Bell. Butternut and Buttercup are outstanding for home use and are easily matured in western Oregon; they are of convenient size and high in quality, but they are not adapted to long storage. Sweet Meat has good quality and is long keeping.

Tomato. Early determinate, nonstaking types: Victor, Bounty, Gem, Pennheart, and new OSU releases, Willamette and Medford. Medium early determinate: Wasatch, Pritchard, and Early Pak 7. Good hybrids of medium maturity, indeterminate, stake well: Moreton Hybrid, Big Boy Hybrid, Big Early Hybrid, and Burpee Hybrid. Early indeterminate: Valiant, Faribo, and Hybrid E. Indeterminate, nonhybrid, medium early, stake well: Queens, Stokesdale, and Red Jacket (potato leaf). In the next few years many new varieties can be expected. Campbell 135 is rather crack-resistant but somewhat late here. Ace is large-fruited and of good quality, but somewhat late; Immuna Prior Beta is small-fruited, with unusual ability to set fruit at low temperatures. The recent OSU release, Large German Cherry, is worthy of trial. Golden Boy has a large mild yellow fruit. California VF 145 strains are medium late but of promise for verticillium and fusarium resistance.

Watermelon. Klondike (many strains), New Hampshire Midget (early ice box type, only fair quality, very small), Charleston Gray (fusarium-resistant, good shipper, relatively late maturing), and Crimson Sweet (fusarium-resistant). New ice box melons should be tried.

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Trifluralin and Zinophos Tested for Compatibility

In crucifer plant beds, or with direct seeded cole crops, it is often desirable to include a herbicide, and an insecticide for root maggot control. Trifluralin (Treflan) is a selective herbicide which is effectively used as a preplanting soil treatment with direct seeded cole crops. Zinophos (*O,O*-diethyl *O*-2-pyrazinyl phosphorothioate) is often used as a broadcast soil treatment for symphylan control and is also quite effective in reducing root maggot damage on cole crops during the first four to six weeks of growth.

Last spring the question arose as to whether Zinophos and trifluralin were compatible. Several things would be involved, including physical compatibility in the spray tank prior to application, as well as possible reaction in the soil which might affect performance of the two pesticides. Reaction between the two chemicals could produce by-products which would be phytotoxic to the crops involved.

Physical compatibility "in the spray tank" was investigated by Dr. James Witt, Agricultural Chemistry Specialist, by means of laboratory tests. Both Zinophos and trifluralin emulsifiable concentrates mixed well with tap water. The combined emulsions were 99% stable for 24 hours and appeared to be as homogenous as the Zinophos and trifluralin emulsions were separately.

To test the performance of the materials when applied together as a preplanting soil treatment, a series of replicated 16 by 20 foot plots were established on Chehalis silty clay loam soil at the Vegetable Crops Farm at Corvallis. The materials in water were sprayed onto the soil on May 7 at rates of two pounds actual Zinophos and 3/5 of a pound actual trifluralin per acre. A total spray volume of 50 gallons per acre was used, and the pesticides were immediately rotary tilled into the soil to a depth of about 3 inches. The following day, seven different cruciferous crops* were seeded through the plots. Observations on weed control and phytotoxicity were made on June 19, and estimations of root maggot control were made on three different crucifer varieties over a period of about seven weeks.

Results

Root maggot control. Radishes, the first crop to mature, were scored for maggot control on June 12. Cold, rainy weather in late May and early June had delayed growth of the crop and activity of the cabbage maggot adults. Results of the examination, shown in Table 1, indicate good protection against the maggots in plots treated with Zinophos. The small differences between plots treated with Zinophos and Zinophos plus trifluralin are not significant. Plots treated with trifluralin alone showed slightly more maggot damage than the untreated checks, but again these figures are not significant.

Results of an examination of cabbage plants dug on June 20, 43 days after planting the seed, were similar to those from the radish plots. Small injuries made by early-stage maggots are more difficult to see on a cabbage root than on a radish, and this may have resulted in the higher control ratings for cabbage shown in the table.

* Radish, Scarlet Globe; Turnip, Purple Top Globe; Rutabaga, Golden Neckless; Broccoli, Waltham No. 29; Cabbage, Danish Ballhead; Brussels sprouts, Jade Cross; and Cauliflower, Snowball Y.

Table 1. Effectiveness ratings for weed and root maggot control with Zinophos and trifluralin, Corvallis, 1968

Treatment and rate active ingredient per acre	Effectiveness ratings			
	Cabbage maggot control*			Weed control**
	Radish (35 days)	Cabbage (43 days)	Turnip (53 days)	(Redroot pigweed)
Zinophos (2 pounds)	87.50	96.00	5.50	1.2
Zinophos (2 pounds) Trifluralin (¾ pound)	83.00	97.00	5.00	8.5
Trifluralin (¾ pound)	40.00	44.75	1.00	8.8
Untreated check	47.75	46.00	2.25	1.5

* Based on values assigned to the following quality categories: Clean (no maggot injury). A rating of 100 would indicate perfect maggot control.

** Weed control ratings were in the range of 0 (no effect) to 10 (complete kill). Weed control evaluation was made primarily on redroot pigweed. Groundsel was the second most prevalent weed species in the area, but it was not controlled by any of the chemical treatments.

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Trifluralin Tested . . .

A final evaluation of the effectiveness of Zinophos, with and without trifluralin, for maggot control was made with Purple Top turnips. On July 1, 53 days after planting, the turnips were considered to be of marketable size, and samples of 100 roots from each type of treatment were pulled and examined for degree of maggot injury. The results (see Table 1) showed immediately that two things had happened since the last evaluation: the maggot infestation had increased greatly, and Zinophos had lost most of its biological activity sometime short of 53 days after application. There were only two marketable turnip roots in the entire 400-root sample.

Weed control and phytotoxicity. In evaluation of crop growth six weeks after planting, no differences between chemical treatments were observable and all treatments were comparable to the untreated checks.

Weed control was evaluated 42 days after planting. No interaction of chemicals was evident, as shown in the table.

It was concluded that soil incorporation of Zinophos and trifluralin, applied as a tank mix of the emulsifiable concentrates in water, did not change the biological activity of either pesticide or produce by-products which had observable phytotoxicity to any of the seven crucifer crops studied.

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Vegetable Notes . . .

Male sterility is of interest in many vegetable crops because it provides a means of controlling pollination in the production of F_1 hybrid seed. Hamdy and Munger (*Proc. Am. Soc. Hort. Sci.*, 92, 1968), reported that male sterility was observed in Cucurbita pepo L. in 1961 in Egypt, in the 'Eskandarany' variety, and introduced to the U.S.A. as P.I. 228,241 (male sterile 'Eskandarany'). Male sterility is expressed as shriveling and browning of the androecium. This expression has been consistent under a wide range of environmental conditions. The character is controlled by a single recessive gene designated as ms_2ms_2. Cytological studies show that meiosis is normal and pollen microsporocyte formation follows the quartet stage. Anatomical studies show that hypertrophy of the tapetal cell layer of the sporangium is characteristic for male sterile anthers. Immature pollen from male sterile buds contains less cytoplasmic material than the fertile ones.

During a period of floral induction of 'Main Crop' cauliflower plants (2 weeks under 16 hours of light at 41° F), there was a significant increase in sugar and starch content compared to that in vegetative plants grown at 68 to 79° F. Sugar and starch content did not increase and flowering was prevented when light and CO_2 were excluded during growth at 41° F. A three-day dark period or a high temperature at 92° F with light following growth at 41° F reduced the carbohydrate level and prevented flowering. These results were obtained in growth chambers by Sadik and Ozbun at Cornell University, Ithaca, New York. (*Plant Physiol.*, 43:1696-1698, 1968).