Controlling Vegetable Diseases in Seedbed and Coldframe
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J.H. Muncie
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J. H. MUNCIE

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CONTROLLING VEGETABLE DISEASES IN SEEDBED AND COLDFRAME

J. H. MUNCIE

Too many times diseases of vegetable crops go unnoticed until the plants in the field are almost ready to harvest. At this stage it is almost impossible to save the crop. Vegetable disease control should be started when the seed is sown in the seedbed and continued through the season in the field. Rotation of crops and plowing under old plant refuse, soil and seed disinfection and spraying are all necessary for growing disease free vegetables. These measures insure better production and better quality vegetables for the market.

Details of soil disinfection for seedbed and coldframe and seed treatments for the more important vegetable crops are given herewith.

SOIL DISINFECTION

Where steam is not available for soil sterilization, fungi which cause damping-off and certain other diseases may be destroyed or inhibited by treatment with chemicals. Formaldehyde either as a liquid or dust is the material most commonly employed.

Liquid Formaldehyde—Where large quantities of soil are to be disinfected, seedbeds may be drenched with formaldehyde solution made up at the rate of 1 gallon of the material in 50 gallons of water. This is applied at 1 to 1½ gallons to the square yard, or approximately 1 pint to the square foot of soil surface. After treating, cover the soil for 24 to 48 hours with a tarpaulin or sacks, after which the soil should be spaded once or twice to allow the formaldehyde gas to escape. Allow the treated soil to stand 10 days or 2 weeks before setting seedlings.

For small quantities of soil add 1 level teaspoonful of formaldehyde to 5 teaspoonfuls of water and mix thoroughly with enough soil to fill a 20 x 14 x 3 inch flat. For 1 bushel of soil, use 2½ teaspoonfuls of formaldehyde and mix as above. Allow soil to stand 24 hours before seed is sown. Water thoroughly after sowing seed. Do not set seedlings or cuttings in such soil until after all odor of formaldehyde has disappeared. Seeds sown in disinfected soil need no treatment for damping-off. If damping-off appears on the seedlings, treat as recommended under "Damping-off Control."

Formaldehyde Dust—To prevent puddling of the soil from saturating with formaldehyde solutions, formaldehyde dust may be used. Commercial preparations of this material are much more expensive than liquid formaldehyde and rapidly lose strength even in air tight containers. A home-made dust may be made by mixing 1 pound of formaldehyde with 5⅓ pounds of inert carrier. Carriers comonly used are kaolin, sawdust or dried, finely sifted muck. Place the carrier in a drum and add the formaldehyde while stirring with a shovel. Add small stones to the drum, and roll for 2 or 3 minutes. The dust should be used as soon as possible. Add 1½ pounds of the home-made dust to each bushel of soil and mix thoroughly by shovelling. For greenhouse benches, the dust is mixed directly with the soil at the rate of 2 ounces to each square foot of soil where the soil is not over 3 inches deep. Water thoroughly after sowing seed.

DAMPING-OFF CONTROL

Damping-off Control—Damping-off of seedlings may be caused by one or more of several soil inhabiting fungi. Soil treatment as outlined above often gives very satisfactory control of the disease **before** the seedling has pushed its way above ground.

However, after the seedling has emerged above ground, the damping-off fungi may be present just below the soil surface. Here they attack the young seedling, causing it to rot off. To prevent this post-emergence type of damping-off the seedbed or flat of seedlings may be treated as follows:

Red Copper Oxide Treatment—The red copper oxide is dusted on the surface of the soil at the rate of 1 ounce to each 30 square feet. Another form of red copper oxide known as Cuprocide 54 may be used as a soil sprinkle at the rate of ½ ounce of the material in 1 gallon of water. One pint of this suspension is applied to the square foot of seedbed surface. **Do not use this or other copper materials on cabbage or related plants.**

Semesan Treatment—Semesan is usually applied as a sprinkle upon emerging or young seedlings. Follow directions given by the manufacturer which usually call for a solution made up at the rate of 1 part of semesan in 400 parts of water.

Zinc Oxide Treatment—This is applied as a dust at the rate of ½ ounce of zinc oxide sifted evenly over each square foot of flat or bed surface. Water lightly to wash material from the seedlings. **Do not use zinc oxide on peppers, lettuce and tomatoes.**

On older seedlings these materials may be applied at heavier dosages on areas where damping-off has appeared. However, best control is obtained by treatment before damping-off appears.

TREATMENTS FOR VEGETABLE SEEDS

Crop	Seed Borne Disease	Fungicide or Treatment	Method
Cabbage Cauliflower Collards Brussels Sprouts Kale Kohlrabi Radish Turnip	Black Leg Black Rot Alternaria Leaf-spot	Hot water 122°F. (Use Thermometer)	Soak cabbage seed 25 minutes in cheesecloth bags at constant temperature. Test germination after treating. All other seeds soak 15 minutes as above.
	Black Rot	Corrosive Sublimate 1–1000	Dissolve 1 tablet in 1 pint of water or 1 ounce in 7½ gallons of water and soak 30 min. Rinse thoroughly and dry.
	Damping-off Wire stem	Semesan Dust or Semesan Jr.	Use according to manufacturers' directions on container. 1 ounce to 3 pounds of seed.
Cucumber Squash Muskmelon Pumpkin Watermelon	Scab Angular Leaf-Spot Anthracnose	Corrosive Sublimate 1–1000 solution then dust with	Dissolve 1 tablet in 1 pint of water or 1 ounce in 7½ gallons of water. Soak seed in this solution 5 min. Rinse thoroughly and dry.
	Damping-off	Semesan or Red copper oxide	According to directions of manufacturer. 1 teaspoonful to 2–5 pounds seed. Place seed and dust in tight container and mix thoroughly by shaking.
Egg plant Pepper	Wilt Alternaria and Phomopsis Spot	Hot water 122°F. (Use Thermometer) Dry seeds and dust with	Soak seeds in cheesecloth bags for 30 min. Test germination after treating.
	Damping-off	Semesan or Red copper oxide	According to directions of manufacturer. 1½ teaspoonfuls to 1 pound of seed. Place seed and dust in tight container and mix thoroughly by shaking.
Beets Lettuce Salsify Spinach	Damping-off	Red copper oxide	½ ounce to 1 pound of seed. Place seed and dust in tight container and mix thoroughly by shaking.
Celery	Leaf Blights	Corrosive Sublimate 1–1000	Place seed in cheesecloth bags and soak seed in lukewarm water 30 min. Dissolve 1 tablet of corrosive sublimate in 1 pint of water. Place bags of pre-soaked seed in corrosive sublimate solution 30 minutes. Wash seed thoroughly after soaking. Dry seed in a warm place. Plant 1/5 more of the treated seed.
	Damping-off	Semesan Solution 1–400	Saturate soil of seedling flat or bed with 1–400 solution (1 ounce of semesan to 3 gallons of water).
Onions	Smut Damping-off	Formaldehyde Drip	1 pint formaldehyde in 10 gallons of water dripped in furrow when seed is sown. Use 125 gallons of solution to the acre in moist soil. For dry soil use 200 gallons of solution diluted 1 pint to 16 gallons of water.
Peas	Damping-off	Semesan Jr.	Use according to manufacturers' directions on container.
Sweet Corn	Bacterial Wilt	Resistant Varieties	Use according to manufacturers' directions on container.
	Root Rots	Semesan Jr. or Merko or Barbak III	
Tomato	Bacterial Spot	Corrosive Sublimate 1–3000	Dissolve 1 tablet in 3 pints of water or 1 ounce in 22 gallons of water. Soak seeds 5 minutes then wash thoroughly in fresh water.
	Damping-off	Red copper oxide	1 teaspoonful to 1 pound of seed. Mix seed and dust by shaking in tight container.
	Bacterial Canker	Use seed from Canker-free plants	(Fermented seed carries less canker than that from ordinary pulped seed.)

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