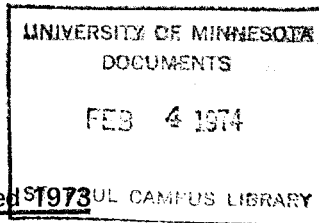


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4 PLANT PATHOLOGY NO. 13—Revised 1973

HERBERT G. JOHNSON and HOWARD L. BISSONNETTE

## Parasitic Diseases of Tomato

Parasitic diseases reduce tomato quality and yield in Minnesota every year. Because the importance of tomato diseases cannot be predicted from one year to the next, you must take certain precautions every year to assure maximum fruit production with minimum disease occurrence. These precautions are:

- \*Plant varieties with as much disease resistance as possible together with good horticultural characteristics.
- \*Purchase disease-free transplants from a reliable source. Certain tomato diseases can be introduced to your garden on transplants and cause trouble that year and in succeeding crops.
- \*Maintain a disease control program throughout the growing season. Insect control is described in Entomology Fact Sheet No. 11, "Controlling Insects in the Home Vegetable Garden."

### Chemicals suggested for use against tomato diseases

Chemical group	Common name	Some trade names	
A	maneb	Dithane M-45 Dithane M-22 Special Manzate 200 Manzate D	
		zineb	Dithane Z-78 WP Ortho Zineb Wettable Parzate C Stauffer Zineb Acme Zineb
	-----	Dyrene 50% WP	
B	copper fungicides†		
		copper (ammoniacal)	
		copper hydroxide	
		copper oleate	
		copper oxychloride	
		copper oxychloride sulfate	
		copper sulfate (basic)	
		copper sulfate monohydrate	
		copper-zinc-chromate	

†Check brand name products for chemicals in this list.

### SUGGESTED SPRAY PROGRAM FOR DISEASE CONTROL

After transplants are well established in the garden (mid-late June), begin a spray program to minimize the introduction and/or spread of common tomato diseases.

You must use two different fungicides to control the broad range of diseases that attack tomatoes. In the table, spray chemicals are grouped into two categories. Group A chemicals are most effective against fungus diseases; Group B chemicals are effective against bacterial diseases but control many fungus diseases as well.

Best disease control is often obtained by alternating applications, on a 7-10 day schedule, with one chemical from each group. Prepare each chemical according to label directions; apply to leaves, stems, and fruits.

Check label directions for compatibility before mixing insecticides with fungicides. Do not use a sprayer which previously contained a hormone-type substance like 2,4-D—tomatoes are very sensitive to these chemicals. Rinsing with water will not remove these chemicals.

### DISEASES CONTROLLED BY THE SPRAY PROGRAM

#### Early Blight

Early blight, caused by *Alternaria solani*, is a common tomato disease in Minnesota. The fungus causes a spotting of leaves and fruits and, in severe cases, defoliation and fruit rot. You can readily identify the dark brown or black leaf spots by their concentric rings in a target pattern. Early blight is a mid-to late summer disease.

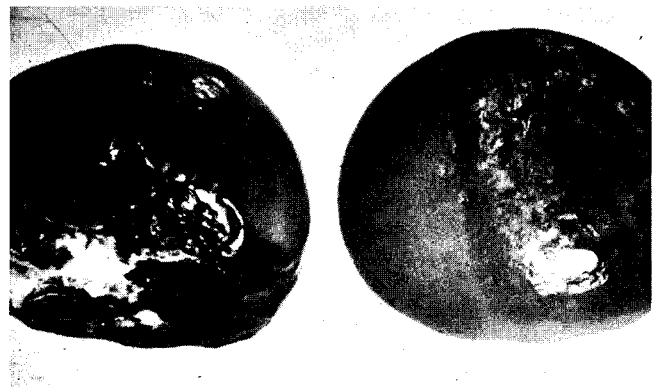


Figure 1. Tomatoes showing the discoloration and wrinkled appearance associated with late blight infection.



Figure 2. Septoria leaf spot of tomato.

### Late Blight

Late blight, caused by *Phytophthora infestans*, is favored by cool nights and moderately warm days with abundant moisture. During favorable weather conditions the disease can infect an entire planting within a few days. Heavily infected plants look like they have frost damage. Symptoms include:

(1) watersoaked leaf spots that enlarge rapidly in moist weather and (2) a white downy fungus growth on the underside of leaves. Fruit symptoms are illustrated in figure 1.

### Septoria Leaf Spot

Another common tomato disease, Septoria leaf spot, is caused by *Septoria lycopersici*. This disease generally does not appear until after fruit set. Infection usually is restricted to leaves (see figure 2), but fruit infection can occur. Defoliation is common after a heavy infection.

### Bacterial Speck and Spot

Bacterial speck, caused by *Pseudomonas punctulans*, is found on leaves and is most noticeable on fruits (see figure 3). Only young fruits are susceptible. Severe losses occasionally occur, especially on early crops.

Bacterial spot, caused by *Xanthomonas vesicatoria*, also is more noticeable on fruit but may seriously injure leaves. Infected green fruits have slightly raised spots that are one-eighth to one-fourth inch in diameter and brown with rough surfaces. Ripe fruits are not infected.

Both bacterial diseases often infect plants in the seedling stage; spread to green fruits takes place during wet weather. Copper-containing fungicides help hold this spread in check.

## DISEASES NOT CONTROLLED BY SPRAY PROGRAM

### Bacterial Canker

Initial symptoms of bacterial canker, caused by *Cornebacterium michiganense*, are wilting and curling of leaves on part of the plant. Later these leaves turn brown but do not fall. Disease symptoms spread throughout the plant in a few days or over several weeks. Plants may die prematurely.

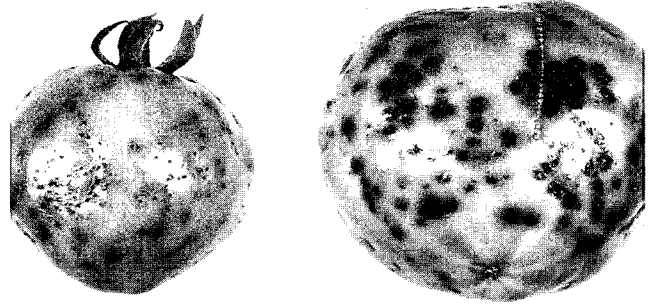


Figure 3. Tomatoes showing symptoms of bacterial speck.

Other disease symptoms include longitudinal stem cracks (2-3 inches) and small (one-eighth inch) fruit spots with persistent white halolike margins. To control this disease, destroy infected plants and obtain transplants from a different source the following year.

### Verticillium Wilt

Initial symptoms of Verticillium wilt, caused by *Verticillium albo-atrum*, are yellowing of older leaves and wilting of young shoots during the day with recovery at night. All branches tend to be uniformly infected; defoliation is common. Plants seldom die but fruits are small.

Laboratory diagnosis is necessary for identification of this disease. Follow control measures for bacterial canker. Do not plant tomatoes or potatoes in the infected area for several years.

### Soil Rot

Fruits in contact with soil may be attacked by the soil-borne fungus *Rhizoctonia solani*, which causes soil rot (see figure 4). Supporting plants to keep fruit off the ground almost eliminates this disease.

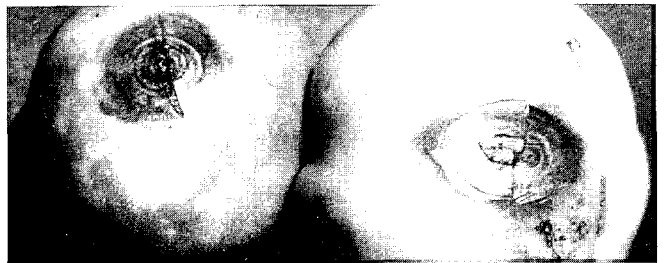


Figure 4. Tomatoes showing symptoms of soil rot.

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