

Connecticut Agricultural Experiment Station

New Haven

LATE BLIGHT OF TOMATOES

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During the seasons of 1932 and 1933 a blight of tomatoes caused extensive damage to the late crop throughout Connecticut. More than forty years ago, in 1890, this blight was once observed in the state by Thaxter*. Since that time, the late blight on tomatoes had never been recorded in Connecticut until 1928. Even from 1928 to 1932 the disease appeared only occasionally in this state. In other states including New York, Virginia, Texas, and California, however, epidemics of this blight, lasting from one to six years, have been reported since 1919.

The late blight of tomatoes is caused by a downy-mildew fungus, *Phytophthora infestans*. Apparently this organism is the same as or is very closely related to the fungus causing the late blight of potatoes. In Connecticut the disease has occurred on tomatoes in seasons when the potato crop has not been seriously affected. In other states, it has been reported occasionally as occurring on tomatoes and potatoes at the same time. According to Ramsey and Bailey,† the amount of damage caused by tomato late blight is dependent upon weather conditions, the disease being most destructive in periods of wet weather when the nights are cool and the days are only moderately warm.

In Connecticut this blight has not been found until the first of September, so only the late crops of tomatoes have been affected. Apparently all varieties, if planted late enough to have an abundance of green foliage in September, are susceptible. The late-blight disease makes its first appearance on the older leaves which are on or near the ground. Infected spots on the leaves are irregular in shape, with a dark, water-soaked appearance. The fungus appears on the under surface of the diseased leaves as a whitish mildew, bearing the spores which spread the disease. If the weather is favorable for the fungus, the entire foliage of the plant is eventually invaded, causing the leaves to become darkened and drooping, resembling the effects of a frost.

*Thaxter, R. Diseases of Tomatoes. Conn. Agr. Exp. Sta. Rpt. 1890:95-96. 1891.

†Ramsey C. B., and Alice Allen Bailey. Tomato Late-Blight Rot, a Serious Transit and Market Disease. U. S. D. A. Circular 169. July, 1931.

Shortly after the foliage has become blighted the disease has been found to appear on the tomato fruits of all sizes as a brownish area with an uneven surface. If the fruit is young a soft rot usually follows infection. In older fruits the diseased areas may stay firm, while the remainder of the fruit ripens normally. Since the fruit does not show signs of the blight until several days after infection has taken place, considerable loss may occur during storage or shipment.

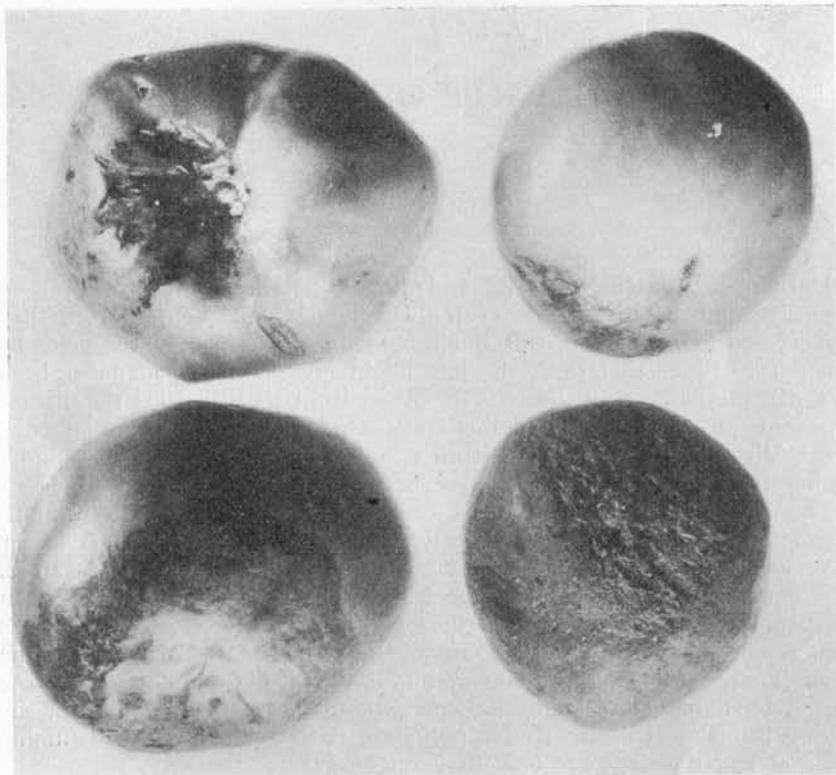


FIGURE 13. Tomato fruits showing lesions of late blight

Control

Preventive measures against late blight of tomatoes have not yet been systematically undertaken by Connecticut growers. In some cases a fair control of the disease has been obtained by one or two spray applications, while in others no benefit has been received from late spraying after the blight has become widespread in the field.

At the Experimental Farm, Mount Carmel, in 1933, the most satisfactory control of this disease was obtained by thorough spraying with 4-4-50 Bordeaux mixture (4 lbs. copper sulfate, 4 lbs. hydrated lime, 50 gals. water). Application of copper-lime dust (1 part monohydrated

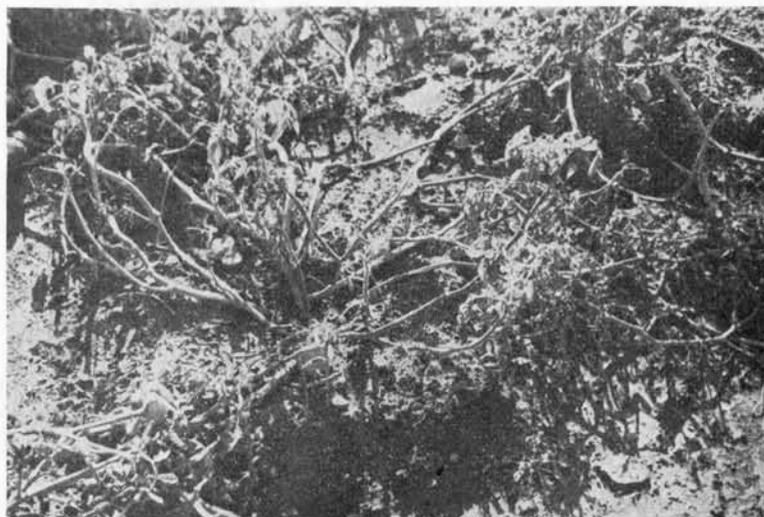


FIGURE 14. Unsprayed tomato plant, photographed September 25, 1933, showing defoliation by late blight. All fruits showing blight infection were removed



FIGURE 15. Photograph of tomato plant which had received Bordeaux spray, taken on same date as above. Note healthy condition of foliage and abundance of healthy fruits

copper sulfate thoroughly mixed with 4 parts of hydrated lime) gave fair control of the disease. The following table shows the results of these

two treatments upon late plantings of Bonny Best, Marglobe and Stone varieties of tomatoes in comparison with an untreated plot.

<i>Treatment</i>	<i>Yield of Tomatoes, lbs. per Plot</i>		<i>Number of Blighted Fruits per Plot</i>
	<i>Ripe</i>	<i>Green</i>	
Check (untreated)	57	0	1846
Copper-Lime Dust	173	168	186
Bordeaux Spray	204	295	7

The ripe fruits listed above were gathered during the season as they became mature, while the green fruits were harvested at the time of the first frost on October 12. The blighted fruits were removed from the vines and counted as soon as they showed blight infection.

Since late blight has become prevalent in Connecticut during the past two seasons, it would seem advisable for growers to undertake control measures if the certainty of a profitable crop of late tomatoes is to be assured. It is recommended that the plants be sprayed with 4-4-50 or 5-5-50 Bordeaux mixture, at least four times during the season. From 100 to 200 gallons of spray per acre should be used at each application and care should be taken to secure thorough coverage of both the upper and lower leaf surfaces. The first application should be made before the plants fall over on the ground. It is possible that the second spray need not be applied until the last week in August or the first week in September. Other spray applications should follow as frequently as is necessary to maintain a coverage of Bordeaux mixture on most of the foliage up to the time of the last harvesting of the fruit.

If copper-lime dust is to be used, it should be applied more frequently than is necessary in the case of Bordeaux spray. From 30 to 40 pounds per acre of the dust should be used for each application and the dusting should be done while the plants are wet.

Although the residue from Bordeaux spray on the tomato fruits is not poisonous, it may prove objectionable in marketing. Less frequent spraying after the fruits have reached a medium size would result in less residue on the tomatoes, but too few sprays might give poor control of the disease. It is also possible that 1-1½-50 Burgundy mixture (1 lb. copper sulfate, 1½ lbs. sodium carbonate, 50 gals. water) may be used in place of the Bordeaux mixture in the later spray applications. Burgundy mixture leaves no noticeable spray residue. However, we have made no experiments with this material for the control of tomato late blight. There is also less residue from copper-lime dust than from Bordeaux mixture.

There are no indications that the late blight fungus is carried by the tomato seed; therefore seed treatment is not recommended.