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LATE BLIGHT OF POTATO

by

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Late blight of potato is caused by a fungus^{1/} which commonly attacks when there are at least occasional rains during the growing season, especially from midsummer until the potatoes are harvested. In Oregon the disease is prevalent in seasons where there is considerable rain during late summer or early fall. If there should be frequent or extended rainy periods throughout the summer, the disease might appear correspondingly earlier. On the coast it may appear quite early in the summer because of the higher humidity there. The disease is perpetuated over winter in diseased tubers used for seed, in volunteer potatoes, and possibly in other ways.

SYMPTOMS

The late blight disease affects the leaves and vines, and sometimes the tubers.

On Foliage.---On the leaves the fungus causes large brown or dark-colored dead areas. If the weather is quite rainy, the disease may spread rapidly by means of wind-borne or rain-splashed spores, killing most of the leaves. It also may kill the leaf stalks and tender parts of the stems. In severe cases the plants appear much as if frosted. An entire field may be killed in a short time under weather conditions favorable for the spread of the disease. (See Fig. 1)

On Tubers.---When the foliage is severely blighted, the disease may spread to the tubers in two ways. Sometimes tubers near the surface may be infected by spores which fall from the leaves and are washed into the ground by rain. Also, if the potatoes are dug too soon after blighting of the vines, spores from the blighted plants may come in contact with the tubers and cause infection. Tubers infected with late blight show areas of dark, dry, more or less shrunken tissue. When such diseased tubers are cut, the dry rot is seen to be rather shallow, penetrating irregularly to a depth of an eighth-of-an-inch, more or less. (See Fig. 2)

^{1/} Phytophthora infestans.

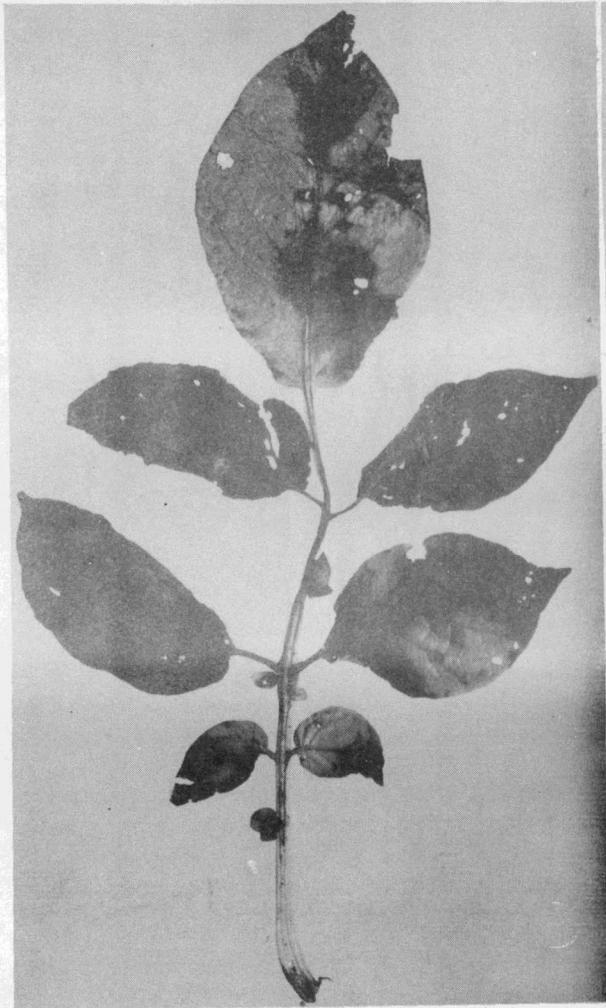


Fig. 1. Late Blight on Potato Leaf.

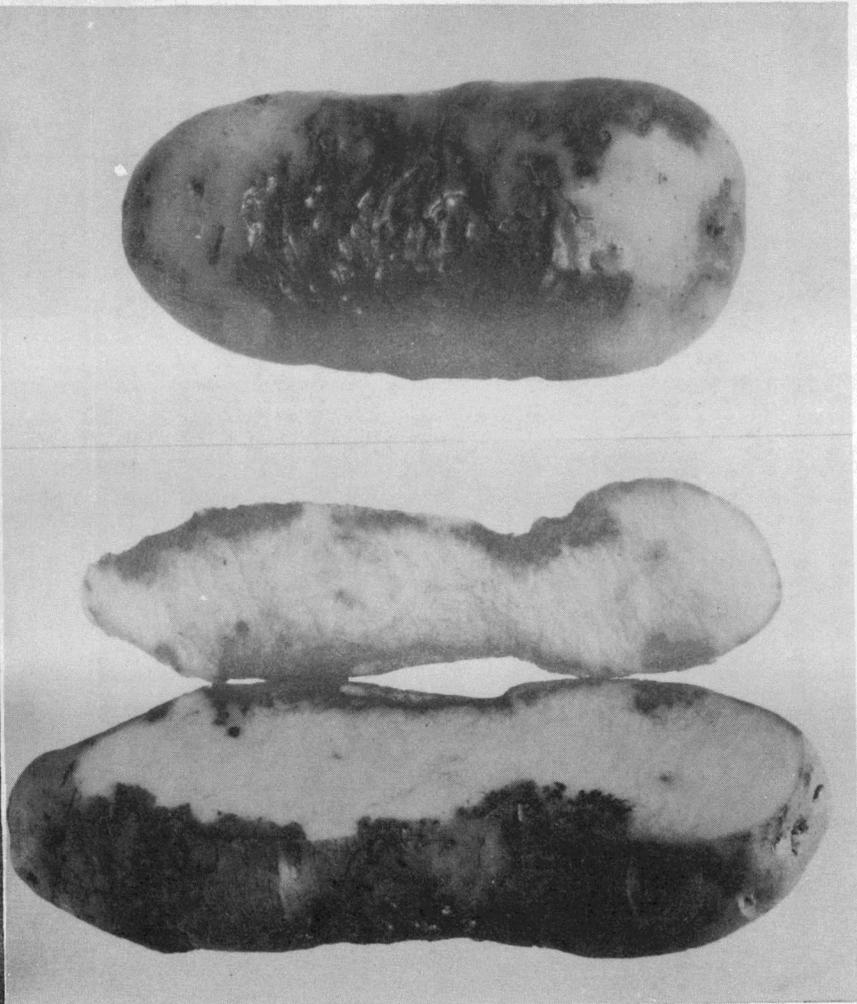


Fig. 2. Late Blight Tuber Rot.
(Photos by Bailey & McKay)

CONTROL

Late blight can be controlled satisfactorily if the proper precautions are carried out carefully.

(1) Use Clean Seed. When planting potatoes it is preferable to use seed stock from fields or localities where no blight occurred the previous season. If necessary to use seed potatoes from a diseased lot, they should be sorted very carefully, saving only tubers which show none of the dark, dry-rot condition.

(2) Spray for Foliage Blight.--In considering a spray program for late blight of potato in western Oregon, there are several things to keep in mind.

- (a) The disease will spread only when there is sufficient rain, fog, or dew or other source of moisture to keep the foliage wet for a few hours.
- (b) The more frequently the wet spells of weather occur and the longer these periods of high humidity continue, the more danger there is of an outbreak of blight.
- (c) Ordinarily one does not expect an outbreak of blight in western Oregon until the usual long drouth of summer is broken by late summer or fall rains.
- (d) During years when there is more than the usual amount of rainy weather in early or midsummer, one may expect an earlier appearance of blight.
- (e) In certain coastal and lower Columbia river counties, the blight is likely to appear earlier than it does in the Willamette Valley because of fogs, mists, and generally high humidity on the coast.
- (f) The time at which it is advisable to begin spraying depends upon these unpredictable weather conditions and it is therefore difficult to set an exact time for the first application.

(3) S P R A Y P R O G R A M

(a) Materials to Use.

Bordeaux Spray 6-6-100.--This is the best spray known for late blight of potatoes. It must be made up very carefully according to directions, in order to be most effective. (Send for Oregon Extension Bulletin No. 477 on the preparation of Bordeaux mixture.) If a commercial product is used, follow directions coming with the materials.

Copper-Lime Dust.--If you have dusting equipment but no sprayer, copper-lime dust may be used but it may not be as effective as Bordeaux spray. To get satisfactory results it may be advisable to use the dust somewhat more frequently than would be necessary with a liquid spray. Purchase this dust ready prepared from a reliable dealer.

Amount of Dust to Use.--The amount of dust required varies according to the size of plants, amount of disease present, and percent of copper in the dust used. Under average conditions about 35 to 40 pounds per acre should be sufficient. The dusting machine should be adjusted carefully so as to deliver an even flow of dust in the proper amount to get satisfactory coverage.

Other Copper Dusts.--In case copper sulphate, the toxic ingredient in Bordeaux and copper-lime dust, is not available, there are several proprietary copper dust products on the market which have given fairly satisfactory results when used on potatoes. If any of these materials are used, they should be purchased from a reliable dealer. Use these dusts according to the directions given by the manufacturers.

(b) When to Spray.

First Application.--Apply the first spray when the potato plants are 4 or 5 inches high, and not later than the time of appearance of the first blossoms. This is an arbitrary date and there may be exceptions, depending upon the date of planting and the possible occurrence of rainy weather before the plants obtain this size. In seasons when rains threaten to cause an earlier outbreak of blight, spray when there is a threat of rain. Get ahead of the rain whenever it comes.

Later Applications.--Follow the first spray with later applications at intervals of 10 days to 2 weeks. As long as rainy or threatening weather continues, it is necessary to repeat the sprays often enough to keep the foliage covered with a protective spray. Try to spray during periods when the spray will have time to dry on the vines well before it rains again.

(4) Prevention of Tuber Rot Following Late Blight.--Most of the late blight tuber rot results from contamination of the tubers by spores from the blighted vines at digging time. Under proper conditions of moisture and temperature the spores germinate and infect the potatoes, causing the typical late-blight dry-rot. There are three precautions which may be taken to prevent tuber infection:

- (a) Keep Tubers Covered with Soil.---Keep the developing tubers well covered with soil by hilling as the plants approach maturity. This helps to prevent spores falling from the leaves coming into contact with the tubers.
- (b) Delay Digging.---If the vines have blighted badly, delay digging for at least two weeks after they are completely dead and dry. This will permit most of the spores to die before the potatoes are dug, thus avoiding tuber infection. Try to dig on a bright, drying day so that the tubers will go into storage as dry as possible.
- (c) Kill the Vines before Digging.---If some of the vines remain green late in the fall after the tubers are mature, they should be killed down in some way before digging the potatoes. Following are some suggested ways of doing this:
1. Spray with Copper Sulphate.---Use a strong copper sulphate solution (20 lbs. in 100 gallons of water). This will kill the foliage and any spores of the late blight fungus present. Wait for about two weeks after killing the vines before digging the potatoes, or until the vines are dead and dry.
 2. Mow the Vines.---If it is impractical to use copper sulphate because of scarcity or high cost of materials, the vines may be cut and allowed to dry before digging.
 3. Spray with Sinox and Ammonium Sulphate.---If copper sulphate is not available, the vines may be killed down with the Sinox and Ammonium Sulphate spray which is now extensively used in Oregon as a weed killer. Use 15 pounds of Sinox and 15 pounds of Ammonium Sulphate in 100 gallons of water per acre as a spray on the vines. This should kill them quickly after which one should wait about two weeks or until the vines are dead and dry before digging the potatoes. (This method was suggested by the Farm Crops Department at Oregon State College. For further information on the use of Sinox as a weed killer, see Oregon Agr. Exp. Sta. Bul. #403.)