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LATE-BLIGHT OF POTATO

by

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Late-blight of potato is caused by a fungus<sup>1/</sup> which commonly attacks when there are periods of wet weather and high humidity during the growing season, especially from midsummer until the potatoes are harvested. In Oregon the disease is prevalent in seasons and localities where there is considerable rain during late summer or early fall. If there should be frequent or extended rainy periods earlier in the summer, the disease might appear correspondingly earlier. On the coast and along the lower Columbia River it may appear quite early in the summer because of 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)

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<sup>1/</sup> Phytophthora infestans.

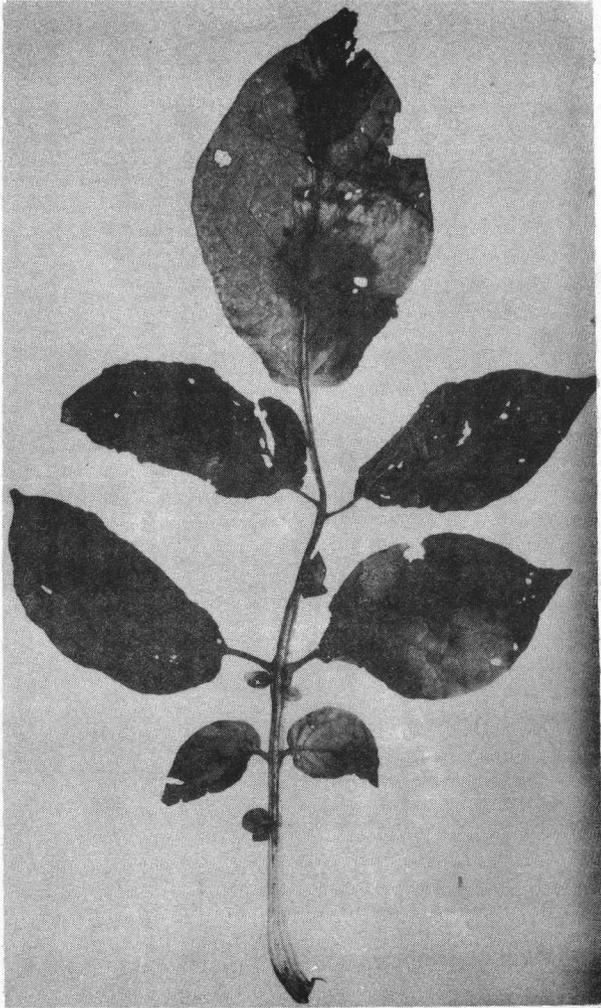


Fig. 1. Late Blight on Potato Leaf.

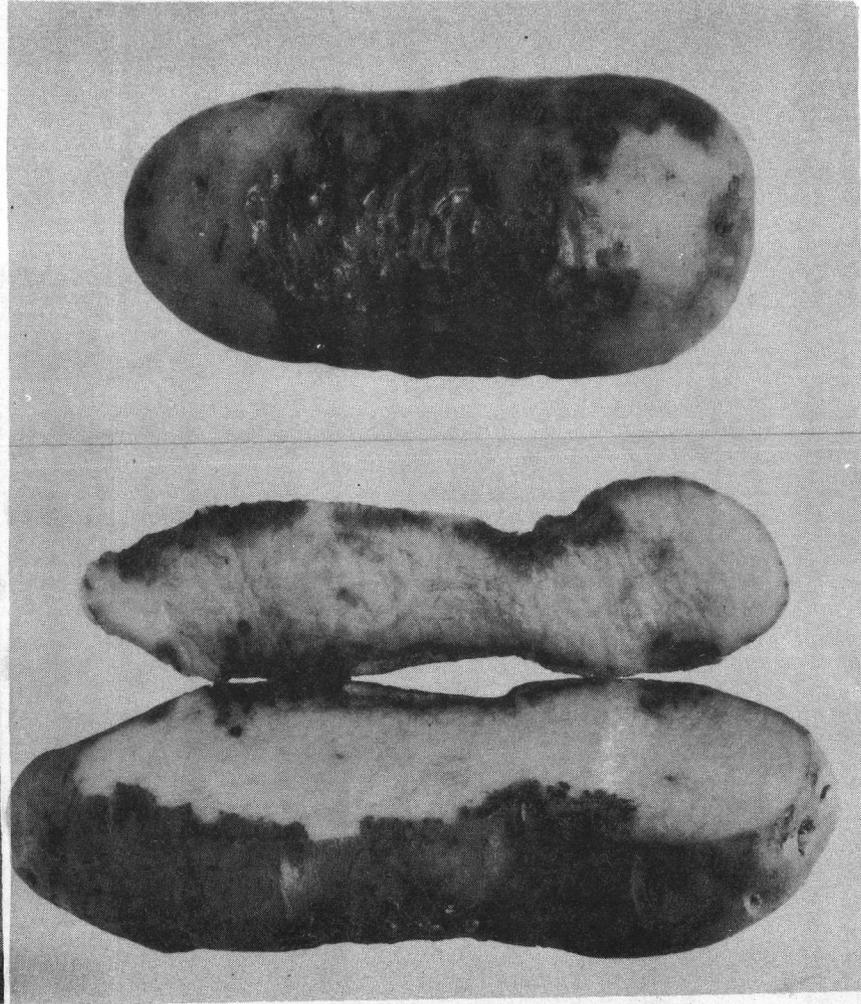


Fig. 2. Late Blight Tuber Rot.  
(Photos by Bailey & McKay)

### 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, mist, 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 wet rainy weather in early or mid summer, one may expect an earlier appearance of blight.
- (e) In some regions, such as the coastal and Columbia river counties, where there is likely to be more rain, fog and mist during the early summer and midsummer months than in the drier regions, the blight is apt to appear correspondingly earlier.
- (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) C O N T R O L   P R O G R A M

- (a) Spraying versus Dusting.—Late-blight can be controlled with either sprays or dusts providing the right materials are used and applied properly. It is important to have good machinery, whether sprayer or duster, that is suitable for the type of land you are farming. It is necessary that you be able to cover your field quickly and do a thorough job of spraying or dusting as the case may be.
- (b) Spray or Dust 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 Agricultural Experiment Station Bulletin No. 393 on the preparation of sprays. See pages 16-20.) If a commercial product is used follow directions coming with the material.

Copper-Lime Dust.--When applied properly copper-lime dust has given very good control. Several brands are available any one of which should be satisfactory provided the copper sulphate is finely ground and present in sufficient concentration. The dust should have a copper content equal to not less than 6% metallic copper. To get satisfactory results it may be advisable to use the dust somewhat more frequently than would be necessary with a liquid spray. See below under (c) When to Spray or Dust, paragraph heading, Dusts.

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 30 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.--There are several other copper dust products on the market which have given fairly satisfactory results when used to control late blight of potatoes. Among these are copper oxide and basic copper sulphate. The copper oxide may be used either as a spray or as a dust. A finely divided basic copper sulphate dust diluted with a suitable inert ingredient looks promising if used at weekly intervals during the danger period. If any of these materials are employed they should be purchased from a reliable dealer and used according to the directions given by the manufacturers.

(c) When to Spray or Dust.

First Application.--There are two points of view which may be taken with respect to the proper time to begin spraying or dusting, namely, (1) to regard it as a matter of insurance and start early regardless of the weather, or (2) to gamble on the weather and put it off until the last minute hoping to get in ahead of threatening weather just in time to save the crop. The former practice, if followed up with sufficiently frequent applications throughout the season, will surely save the crop but may require a little more material and labor. The latter, while saving some material and work, may lose the crop.

Therefore, as a matter of insurance, one should begin spraying or dusting soon after the young plants are up, and when they are not more than 3 or 4 inches high at the latest.

Later Applications.--As a general rule dusts probably should be applied at shorter intervals than liquid sprays to secure equal protection.

Sprays. Liquid sprays, such as bordeaux, should be repeated at intervals of 10 days to 2 weeks throughout the danger period. In seasons when there is considerable wet weather, due to rains, mists, fogs or dews, throughout the late summer and fall, this would mean to the end of the growing season. Do not spray while it is raining. The spray should have time to dry on the vines before it rains.

Dusts. Dusts should be applied at weekly intervals throughout the danger period. Dusting should be done very early in the morning when there is no wind.

(d) Thoroughness and Timeliness Essential.

Regardless of whether liquid sprays or dusts are used the essential thing is to begin in time to get ahead of the blight and repeat often enough to keep the vines protected at all times. The degree of control will depend upon the care and faithfulness with which these preventive measures are carried out.

(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) 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. No. 403.)
- (3) Mow the Vines.--If it is impractical to use one of the above-mentioned chemicals to kill the vines, they may be cut and allowed to dry before digging the potatoes.