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Potato Early Blight

Symptoms, Cause and Control

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Figure 1.—Leaf of Russet Burbank variety showing typical lesions of early blight. These spots continue to enlarge until the leaf is killed.

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The potato foliage disease, Early Blight, is caused by a fungus, *Alternaria solani*. In Idaho, large areas of potatoes grown under sprinkler irrigation are damaged by early blight. Losses as great as 100 sacks per acre have been reported. Generally where potatoes have been grown under sprinklers for two or more consecutive years, there has been a yield reduction due to this disease.

The first indication of early blight is the appearance of spots on the leaves next to the ground. With subsequent spore production and infection, spots appear on the upper leaves of the plants (Figure 1). These brown-to-black spots are made up of concentric rings which produce a "target" effect (Figure 2).

The spots increase in size and eventually the entire leaf dies. Plants may die from early blight as early as the middle of August. There may be some confusion between early blight and early dying. Early blight can be readily distinguished from early dying in that early blight has the characteristic leaf spots.

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Figure 2.—Close-up of an early blight lesion that illustrates the characteristic concentric rings produced by *alternaria* infection.

Development of Early Blight

For any foliage disease to develop there needs to be (1) a susceptible host, (2) a means for disseminating the causal organism, (3) the causal organism, and (4) an environment suitable for infection and disease development. The removal of any one of the four conditions will result in the control of a foliage disease.

The Host: The Russet Burbank is susceptible to early blight.

Dissemination: Wind is the chief means of disseminating the spores (seeds of fungus) from leaf to leaf, plant to plant, and field to field.

Causal Agent: The causal agent, *Alternaria solani*, has been with us for a good many years and the elimination of its presence is impossible. Something can be done about the amount of inoculum through the use of cultural practices since the organism overwinters in old potato foliage refuse, vines and leaves.

Environment: High humidity, or water on the leaf surface, is necessary for infection and development of a foliar disease. Sprinkler irrigation provides this necessary environment. Each time a potato field is irrigated by sprinkler the moisture requirement is satisfied. Thus, during each sprinkler irrigation, a life cycle of the organisms can be completed. The longer the interval between irrigations the slower the spread of early blight.

Suggested Control Recommendations

Cultural Control

1. Decrease the amount of inoculum.
 - a. Do not follow potatoes with potatoes.
 - b. Plow under all potato refuse.
2. Decrease the number of life cycles of the organism.

- a. Irrigate according to soil moisture. Theoretically, each sprinkling eliminated will give one more week's growth. If in doubt on when to irrigate, consult your county agent.

Chemical Control

By following the cultural control practices, the number of chemical applications might be decreased. The control one can expect from chemical treatment rests in the use of the right chemical, at the right frequency, and with the right equipment.

Right Chemical: Zineb or Maneb. Trade names for Zineb are Dithane Z-78 and Parzate. The trade names for Maneb are Dithane M-22 and Manzate. A good sticker such as B 1956 should be used as recommended by the manufacturer.

Right Rate: Zineb and Maneb should be used at the rate of 1½ to 2 pounds per 100 gallons of water. One hundred to 150 gallons of this solution should be applied per acre. The amount applied depends upon the amount of foliage to be covered. **Complete coverage of the foliage is very important.**

Right Time: Start chemical control when the lower leaves (leaves next to the ground) contain one or more spots.

Right Frequency: Treat the field after sprinkling when the field has dried up sufficiently to allow equipment to go through the field. Continue applications after each sprinkling until August 20.

Right Equipment: The ground sprayer should develop between 300 and 400 pounds pressure and contain a tank agitator. Both the upper and under sides of the leaf surface should be covered. The sprayer should have a high gallonage capacity capable of putting out 100 to 150 gallons per acre. Commercially made sprayers are available, but home made sprayers can be built to do a good job. On the boom there should be a minimum of 3 nozzles per row—one over the center of the row and a drop nozzle between each row. There should be vine lifters around each tractor tire. Aircraft application should follow immediately after the sprinklers are turned off so that the moisture on the leaves can be used to spread the chemical over the leaf surface.

PESTICIDE RESIDUES: These recommendations for use are based on the best information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues, follow recommendations carefully with respect to dosage levels, number of applications, and minimum interval between application and harvest.

THE GROWER IS RESPONSIBLE for residues on his crop as well as for problems caused by drift from his property to other properties or crops.

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