

Management of Potato Late Blight in the Columbia Basin

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Strict sanitation practices, proper irrigation management, cultural practices, and timely applications of fungicides are needed to manage late blight. Sanitation practices are aimed at reducing potential sources of infection and include (1) planting disease free seed, (2) eliminating culls and refuse potato tubers, and (3) eliminating volunteer potatoes. Over irrigation and irrigation during wet weather will aggravate a late blight situation and make control much more difficult. Disease severities in several fields and sections of fields in the Columbia Basin in previous years were increased by improper irrigation. Sanitation and proper cultural practices will reduce disease pressure and increase the effectiveness of fungicides

Deep planting of seed tubers, forming adequate hills, not planting potatoes near center of pivot, completely killing vines two weeks before harvest and harvesting only during dry weather will reduce tuber infection. Good air flow throughout the pile in storage and low humidity air for a short time after harvest will reduce storage losses.

Late Blight is a very explosive disease and fungicides are most effective when applications are made before infection or when the disease is in the very early stage of exponential growth. This later use occurs before the visual perception threshold or before most individuals can find late blight in a field. Later applications are helpful in reducing the rate of disease development but are not nearly as effective as applications made just before inoculum first hits a field or during the very early stage of exponential growth. Furthermore, it is paramount to prevent infections from becoming established in sprinkler irrigated fields because the microclimate within the plant canopy is generally favorable for continued disease development whenever the field is irrigated.

The Columbia Basin Late Blight Forecasting System has been expanded for 1997 to include weather data from Prosser, Hanford, and Othello, WA, and Hermiston, OR. Late blight forecasts will be made in mid to- late May, and again in mid-July. Weather conditions in April and May are a main component of the late blight forecasts. Short and long term weather forecasts are used in conjunction with the disease forecasting models.

If late blight is predicted to occur by the Columbia Basin Late Blight Forecasting System, applications of protectant fungicides need to be made before plants are 8 inches tall, and continued at weekly intervals until mid-July. Further recommendations based on the current situation and weather forecasts will then be given. Updates will be given throughout the season in both Washington and Oregon via the late blight hot lines (1-800-984-7400 in WA, and 1-800-705-3377 in OR) and spud Topics.

Total crop canopy coverage with fungicides is essential for late blight management. Application skips will most likely be destroyed by late blight and certainly will be areas of spore production, creating a higher risk of infection within the field and adjacent fields. Our research has shown that with air application after row closure, at least two applications are needed (over a two week period is the best way to ensure) before the fungicide is redistributed adequately throughout the canopy. Applications are needed

weekly to cover new growth. Furthermore, we demonstrated that new strains of the late blight fungus (US-8 and US-11) are more difficult to control with fungicides than the older strain (US-1). However, research has shown that the new strains of the late blight fungus can be controlled with chlorothalonil (Bravo), metiram (Polyram), mancozeb (Dithane M-45, Manzate 200) and maneb and a mixture of polyram with Super Tin, but applications must be made before infection, all foliage must be covered, and new growth must be covered. This means that EARLY and REPEATED applications at SHORT INTERVALS are needed for control. Only use copper based fungicides in combination with other fungicides.

Method of fungicide application is important in how well late blight is controlled. Our research has shown that ground application is the most consistent method for applying the greatest quantity of fungicide throughout the canopy; chemigation applies the least. Air application is effective, but don't expect good applications in situations where trees, power lines, houses, or other obstacles prevents the plane from flying consistently close to the canopy. Regardless of method used, make certain no application skips occur.

In tests in the Columbia Basin of Washington and Oregon in 1996, the Section-18 materials (Tattoo C, Curzate M-8 and Acrobat MZ) and a standard protective fungicide (Bravo 720 was used in Oregon and Polyram plus Super Tin was used in Washington) were applied by air and chemigation to Russet Burbank potatoes. Leaf samples were collected and tested for effectiveness of control at various times after application. The tested fungicides gave equal and good control in the two states when applied by air. In the chemigation test in Oregon, the Section-18 materials and Bravo 720 gave similar control. However, in the chemigation test in Washington, Tattoo-C showed significantly better control in two of four collections; Polyram plus Super Tin and Acrobat MZ were the best in one collection; and Tatto-C, Acrobat MZ, and Polyram plus Super Tin were better than Curzate M-8 in the fourth collection. (Data will be supplied in subsequent publications).

Identification of strains of the late blight fungus is important in our strategy to manage late blight in the Columbia Basin. Contact the authors if you observe late blight so that arrangement can be made to collect and determine fungus genotype.