

LATE BLIGHT EPIDEMIC IN CENTRAL WASHINGTON IN 1992

by

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Late blight, caused by the fungus *Phytophthora infestans*, was severe throughout south central Washington in 1992. It was present to a lesser degree in this area the previous two years. At least three storages had substantial losses due to tuber rot after the 1991 season and more are expected after the 1992 season. Late blight has not traditionally been a factor in potato production in south central Washington because of our semi-arid environment. However, a lack of sanitation practices by growers and processors, and the use of sprinkler irrigation may be altering the late blight situation.

Several factors contributed to the epidemic in 1992. First, the preceding winter was mild and the fungus survived in infected tubers from the 1991 season. Infected cull piles and volunteer potato plants were probably the main sources of inoculum in 1992. Another source of inoculum may have been late blight infected seed.

A second factor that contributed to the 1992 epidemic was wet weather. Rainfall was above normal with 1.2 inches during 7 rainy days in June and 0.5 inch during 4 rainy days in July as measured at Prosser. This is not much precipitation when compared to some other potato production areas; however, when coupled with sprinkler irrigation it was sufficient to favor an epidemic. Late blight was first found during the 1992 season in central Washington on 7 July, indicating that moisture in June favored a build up of inoculum in culls and areas with volunteers with subsequent movement of the fungus into potato fields.

Late blight will continue to be a problem until better sanitation practices aimed at reducing potential sources of infection are utilized. These practices focus on the elimination of culls, volunteers, and the use of clean seed. Cull potatoes need to be buried and covered with at least two feet of soil so that green shoots do not reach the soil surface. Culls coming out of storages in late winter are especially threatening sources of inoculum because infected tubers have been protected from low winter temperatures which kill the late blight fungus. If these culls develop late blight the fungus is poised to move onto susceptible, emerging volunteer and current season potato plants. Finally, seed tubers should be purchased from growers in areas where late blight is not a problem or the disease is successfully controlled.

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The following cultural practices should be used to manage potato late blight in Eastern Washington:

1. Use certified disease-free seed stock.
2. Destroy cull piles.
3. Manage volunteers.
4. Adequately hill tubers.
5. Do not over irrigate.
6. Kill vines at least 3 weeks before harvest and reduce irrigation.
 - a. Vines should be completely dead (no green tissue) at harvest.
7. Apply timely applications of fungicides.
8. Avoid harvest during wet conditions.
9. Remove infected tubers prior to storage.
10. Avoid free moisture in storage.

Management of late blight will be more difficult because of resistance in the population of *P. infestans* to the fungicide metalaxyl (Ridomil®). Three of eight samples tested in 1992 from south central Washington were 100% resistant. Another three samples had 15 to 90% resistance and only two samples were completely sensitive to metalaxyl.

Due to this resistance to metalaxyl, more emphasis needs to be placed on the use of protectant fungicides. The protective fungicides (Bravo®, mancozeb) in conjunction with other management practices will effectively manage late blight if applied at 5 to 10 day intervals (check the label) before and during environmental conditions (moisture on leaf surfaces) that favor late blight development. The shorter intervals are needed as late blight pressure increases.

The future use of metalaxyl for late blight management in Washington is questionable. The following recommendations are for the use of Ridomil mixtures to reduce the potential of increasing resistant strains of *P. infestans*. Any anti-resistance strategy also requires good crop production practices such as proper sanitation, use of less susceptible cultivars, and proper management of irrigation water. This course of action has been based on experience in Europe, where Ridomil has been maintained as an effective late blight treatment in spite of resistance.

1. Proper sanitation practices should be followed throughout the season.
2. When using Ridomil, use only Ridomil prepack mixtures -- Ridomil MZ58®, Ridomil/Bravo® 81W, or Ridomil®/Copper 70W applied foliarly. Do not use Ridomil at planting.

3. Apply Ridomil preventively. Avoid curative control measures with Ridomil products. Late blight is a threat if confirmed in the area and/or following summer rain in areas with previous year occurrence of the disease.
4. Do not exceed two applications of Ridomil (any formulation) per season.
5. If conditions are favorable for late blight before or after Ridomil has been applied, use a protective fungicide (mancozeb, Bravo, etc.) on a recommended schedule. A protective fungicide application between Ridomil sprays may be advantageous and is generally recommended.
6. Apply by ground equipment, chemigation or air. Only use chemigation if the irrigation system can apply 0.2 inch per acre or less of water uniformly. Foliar applications should be allowed to dry completely prior to overhead irrigation.
7. Do not apply Ridomil late in the season when plants are under stress (senescent, chlorotic, wilted, etc.).
8. To avoid unnecessary selection, use systemic fungicides (Ridomil MZ58, Ridomil/Bravo 81W, and Ridomil/Copper) only when justified. The timing and frequency of application should be determined on a local basis, keeping the preceding points in mind.
9. Because of the presence of metalaxyl-resistant strains of late blight in the Pacific Northwest, the Ridomil prepacks should be augmented by increasing the amount of the protectant fungicide component. To increase the protectant fungicide to the full label rate, use the following information:

No additional chlorothalonil should be added to **Ridomil/Bravo 81W**.

For **Ridomil MZ58**, use the following table to bring the level of mancozeb to 1.5 lb. ai/A:

Use Rate of Ridomil MZ58	Amount to Add to Ridomil MZ58 to Have the Mancozeb at its Maximum Use Rate			
	Manzate 200	Dithane DF	Dithane F-45	Dithane M45
1.5 lb./A	1.04 lb.	1.04 lb.	0.88 qt.	1.1 lb.
2.0 lb./A	0.72 lb.	0.72 lb.	0.64 qt.	0.8 lb.

There are many formulations of copper fungicide which can be used on potatoes, and they have different maximum use rates. Consult the specific label for the amount to add to **Ridomil/Copper 70W**. Ridomil/Copper at 1.5 lb./A contains 0.9 lb. of copper hydroxide/A and at 2.5 lb./A contains 1.5 lb. of copper hydroxide/A.

10. Continued applications of Ridomil to fields where disease incidence continues to spread is not warranted. Use only protectant fungicides in these cases.

References

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