

Late Blight of Potatoes Fact Sheet

Sebastian Ibarra, Agri-environmental specialist/PMUC

May 2018

Best Management Practices – Control of late blight of potatoes

Late blight of potatoes is a disease caused by the pathogen *Phytophthora infestans*. The pathogen also infects other members of the nightshade family, including tomatoes and hairy nightshade

Different strains of the pathogen vary in their aggressiveness on different hosts and may have different susceptibility to fungicides

Strain US-23 was the dominant strain in Canada in 2016, except in British Columbia where US-8 was the most prominent; US-24 was recovered in Quebec in 2016. Strain US-8 (and to some extent US-24) causes severe disease symptoms on potato leaves and tubers, but is less aggressive on tomatoes. Strain US – 23 is highly aggressive on tomatoes (fruit and foliage), somewhat less aggressive on potato foliage, but highly aggressive on potato tubers

The populations of the pathogen in Canada are largely clonal, meaning they are genetically the same. However, there is some evidence of sexual reproduction of the pathogen in some parts of Canada. This can lead to adaptations that make it harder to control.

Late blight is a community disease and mitigation requires participation from all community stakeholders

The pathogen is primarily spread in the form of spores by wind, infecting potato plant tissue by germinating in relatively cool and humid conditions

Symptoms appear 7 -10 days after the initial infections and often begin in the upper canopy as

small, light to dark green, circular to irregular-shaped, water-soaked spots. However, infection can begin anywhere on the plant (Fig.1). If the disease is seed-borne, lesions may be first observed in the lower canopy or on the stems of young plants. Lesions are often surrounded by a circle of light green tissue. The dying tissue turns grey to tan and becomes dry within a few days (Fig. 1). These lesions produce spores under moist, moderately cool conditions. The spores are white, mildew-like and are found at the edge of the lesion, usually on the underside of the leaf (Fig.1)



Fig. 1 Late blight lesion on leaf and stem with light green halo surrounding dying tissue of the leaf and white spores developing on the underside of the leaf and around stem. Photo: Sebastian Ibarra.

Infected tubers display reddish brown, granular colour of the tissue immediately below the skin

Late blight infected tubers are susceptible to other secondary bacterial and fungal rots

The pathogen can complete many asexual reproductive cycles in a season. Once established, the disease spreads quickly within one to two days depending on weather conditions

Cultural practices are the first line of defense:

Follow the *Crop Rotation Act* and *Regulations*

If possible, avoid planting potatoes in fields next to fields with severe late blight in the previous year

Eliminate the presence of volunteer potatoes

Eradicate hairy nightshade and other nightshade family plants from fields and adjacent areas

Plant certified seed; grade seed before planting, and discard partially decayed or mummified seed. Have these tubers tested by your Provincial Plant Disease Diagnostic laboratory for accurate diagnosis

Ensure potatoes are well hilled; provide appropriate spacing to seed

PEI potato culls must be buried, composted, fed to livestock, or placed underground by June 15 each year

Monitor for late blight with special attention to areas with high moisture, i.e. wind-protected areas in the field, near trees, shaded areas or low spots, and in areas that are difficult to access with sprayer equipment

Use calibrated and maintained fungicide application technology

Harvest in dry weather, when vines have been dead for at least two weeks

Ensure that tubers are dry when placed in storage

Apply fungicides when necessary. Refer to foliar fungicide table at the end of this document.

Use fungicides as part of a preventative program. No fungicide is effective in eradicating disease that has already set in. Rotate fungicide products with different modes of action class to reduce the chances of resistance development

Do not exceed maximum number of applications described in the label for each product

Use the shorter spray intervals described in the label when there is rapid plant growth or high humidity conditions. Use the longer spray intervals listed on the label when hot dry weather is observed

Use an alternate product with a different mode of action when the maximum number of applications of a fungicide is reached

Foliar fungicides registered for late blight of potatoes (1/2) – The table below is not a comprehensive list and is only provided as a reference. Always read the product label; in case of disagreement between the table and the label, the label shall be considered correct.

Active ingredient(s)	Product(s)	Fungicide Class	REI (hrs)	PHI (days)	Re-application interval (days)	Max applications/season	Applications before rotating fungicide class
Azoxystrobin	Quadris F	11	12	1	7	3	1
Ametoctradin + Dimethomorph	Zampro	40,45	12	4	5-10	3	2
Chlorothalonil	Bravo 500 Bravo ZN Echo90DF Echo 720	M	48 48 48 48	1 2 1 1	7-10 7-10 7-10 7-10	12	
Chlorothalonil + Propamocarb	Tattoo C	M, U	48	7	7-14	3	
Copper	Parasol WP * Parasol F * Kocide 2000 * Coppercide WP *	M	48 48 48 48	2 2 2 1	7-10 7-10 7-10 7-10	10 10 10 10	
Cyazofamid	Ranman 400SC	21	12	7	7	6	1
Cymoxanil	Curzate 60 DF**	27	24	8	5-7 b/w 1 st and 2 nd 20 b/w 2 nd and 3 rd	4	
Cymoxanil + Famoxadone	Tanos 50 DF	27,11	24	14	12 b/w 1 st and 2 nd 24 b/w 2 nd and 3 rd	3	
Dimethomorph	Acrobat 50 WP***	40	12	4	5-10	3	
Fenamidone	Reason 500 SC****	11	Until residue dry	14	7-10	6	1

* These products must be used in combination with Mancozeb unless used at topkill with a topkiller or after topkill prior to harvest

** This product must be used in combination with Mancozeb

*** This product must be used in combination Metiram, Mancozeb, or Chlorothalonil

**** This product must be used in combination Mancozeb, or Chlorothalonil

Active ingredient(s)	Product(s)	Fungicide Class	REI (hrs)	PHI (days)	Application interval days	Max applications/season	Applications before rotating fungicide class
Fluazinam	Allegro 500	29	24	14	7-10	10	3
Fluopicolide	Presidio*	43	12	7	7-10	4	2
Mancozeb / Maneb	Dithane Rainshield Manzate Pro-Stick Penncozeb 80 WP Penncozeb 75 DF Raincoat	M	12 24 24 24	1 1 1 1	5-10 5-10 7-10 5-10		
Mancozeb+ Chlorothalonil	Elixir	M	48	1	7-10	22.4 kg/ha	
Mandipropamid	Revus Orondis Ultra A	40	12 12	14 14	7-10 7-10	4 4	
Metalaxyl + Mancozeb/ Chlorothalonil	Ridomil Gold MZ Ridomil Gold/Bravo Twin Pak	4, M	24		10-14 14	3 3	
Metiram	Polyram DF	M		1	5-10		
Oxathiapiprolin + Mandipropamid	Ordonis Ultra B	U15, 40	12	5	7-14	4	2
Phosphorous acid	Confine Extra Phostrol Rampart	33	12 4	1 0 0	7-14 7-14 3-7	5 7 5	
Propamocarb + Chlorothalonil	Tattoo C	28, M	48	7	7-14	3	
Pyraclostrobin	Headline EC	11	12	3	7-10	3	1
Pyraclostrobin + Metiram	Cabrio Plus	11, M	12	3	7-10	3	1
Zoxamide + Mancozeb	Gavel DF	M,22	48	3	7	6	

* This product must be used in combination with a product containing a fungicide with a different class, such as Chlorothalonil