Extension Bulletin E-3205 • New • February 2015

MICHIGAN
Potato Diseases

Botrytis Blight

(Grey Mold and Tan Spot)

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Primary Causal Agent

Botrytis cinerea (Hyphomycetes, Moniliales)

Introduction

Botrytis blight or grey mold (tan spot) is a common disease in Michigan potato fields. The disease is often observed on stems and leaves but when inoculum levels are high, the disease can also be seen on tubers. The lesions on foliage are very similar to and can be confused with those caused by early blight *(Alternaria solani)* and late blight *(Phytophthora infestans)*. The pathogen is able to overwinter in the soil as sclerotia. Leaf and stem lesions lead to early plant death (Figure 1) and decreased yield and tuber quality. Excessive fertilizer inputs and irrigation or precipitation may lead to a dense canopy with reduced air circulation, which can remain wet for extended periods and promote grey mold. The pathogen has a wide host range with reported incidence in more than 200 different hosts, some of which are used in rotation with potatoes. This wide host range causes a drastic increase in inoculum levels over time.

Symptoms

Grey mold is named for the grey conidia that appear on senescing plant tissue (Figure 2). The disease first appears as tan lesions (tan spot) (Figure 3) at the leaf margin (Figure 4). Leaf lesions are often seen on dying tissue or plants that have been damaged. Infection and colonization of leaves often lead to petiole lesions, which constrict the vascular system in compound leaves thus leading to decreased transport of photosynthates (figures 5 and 6). The mycelium spreads from the petiole to the main stem and causes stem lesions at sites of previous injury from fallen leaves or from insect damage, in particular, from corn stem borers. Girdling is the most common result of stem lesions, but under hot conditions complete stem rot may occur in the presence of secondary bacteria. Dry rot symptoms similar to those caused by *Fusarium* spp. may be seen on tubers in storage when inoculum levels are high.

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Figure 1. *Early plant death of potato caused by Botrytis blight.*

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Figure 2. *As tissue senesces, grey-black groups of conidia begin to form on the leaf surface.*

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Figure 3. *Tan lesions can be seen on the margins of leaves during the intial stages of disease. Over time, the lesions progress toward the primary vein.*

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Figure 4. *Initial stage of infection on the leaf margin.*

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Figure 5. *As the disease progresses, lesions become larger and necrotic.*

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Figure 6. *Lesions eventually turn to black necrotic tissue. These dead leaves serve as an overwintering environment for sclerotia.*

Disease Cycle

The fungus overwinters as sclerotia (Figure 7) or mycelium in plant debris. When conditions are favorable, the mycelium produces conidiophores and conidia. On potatoes, *B. cinerea* can be seed-borne and develop from mycelium on the mother tuber. In Michigan with such a wide crop range, mycelium on plant debris in the upper layers of the soil may serve as inoculum sources of the pathogen. Conidia are readily airborne and may also be carried on the surface of splashing rain or irrigation water. Relative humidity around 90 percent is necessary for spore production. Spores landing on potato plants germinate and infect in the presence of free water from dew, rain, mists or irrigation. The optimum temperature for infection is between 65 and 75 °F and can occur within five hours. However, temperatures above 82 °F suppress growth and spore production, although at temperatures this high, secondary bacterial infections can enhance the development of other disease complexes. Infected flowers can spread infection to leaves and stems. In addition, direct contact with moist, infested soil or plant debris can promote infection.

Management and Control

Effective management of grey mold requires an integrated disease management strategy. The disease is controlled primarily through the use of cultural practices and fungicides.

Cultural Control

Many potato cultivars are susceptible to *B. cinerea*. Late maturing varieties appear particularly susceptible but as *B. cinerea* can act as a saprophyte, it is often difficult to assess which cultivars are truly more or less susceptible to the pathogen. When nutrient deficiency and potato early die or

other root-restricting diseases stress plants, the disease can spread rapidly. Practices that limit leaf wetness duration such as irrigation during evening hours and optimal nutritional practices can delay the onset of grey mold.

Chemical Control

Most fungicides registered for use on potatoes are protective in their action and although they suppress and delay onset of infection, do not control established disease. The most effective fungicides in recent Michigan State University trials have been Scala and Luna Tranquility. Tanos may also suppress secondary infections by other pathogens and delay the rapid spread of Botrytis blight through the crop. Refer to Table 1 for product recommendations.

Table 1. Product name, active ingredient, and harvest interval of products currently registered for control of Botrytis blight of potatoes.

Active ingredient	Product, rate and harvest interval	Comments
Chlorothalonil Note: All chlorothalonil products may be applied through irrigation water.	Applause 720, 1.0 to 1.5 pt. (7 days)	Apply every 5-10 days. Do not apply more than 15 pt/A/season. (pints per acre per season)
	Bravo Ultrex, 0.9 to 1.4 lb. (7 days)	Do not apply more than 21.5 lb/A/season. (pounds per acre per season)
	Bravo Weather Stik, Equus 720 SST, 1 to 1.5 pt. (7 days)	Do not apply more than 15 pt/A/season.
	Equus 720 SST, 1 to 1.5 pt. (7 days)	Do not apply more than 15 pt/A/season.
	Echo Zn, 1.5 to 2.2 pt. (7 days)	Do not apply more than 21.5 pt/A/season.
	Initiate 720, 1.0 to 1.5 pt. (7 days)	Apply every 5-10 days. Do not apply more than 15 pt/A/season.
Mancozeb	Dithane DF Rainshield, 2 lb. (3 days)	Apply every 5-10 days.Maximum 15 lb/A/season. May be used through irrigation equipment.
	Manzate Pro-Stick, 1 to 2 lb. (3 days)	
	Penncozeb 75 DF (2 lb.) or Penncozeb 80 WP (1 to 2 lb.) (3 days)	
	Koverall 75 WP, 1 to 2 lb. (3 days)	
Maneb	Polyram 80 DF, 2 lb. (3 days)	
Pyrimethanil	Scala, 7 fl oz. every 7 - 14 days. (7 days)	Maximum of 35 fl oz/A/season. It is recommended that Scala is used in a tank mix with a labeled dose rate of another effective early blight fungicide
Pyrimethanil plus fluopyram	Luna Tranquility 11.2 fl oz. 7 - 14 days. (7 days)	Maximum of 43.6 35 fl oz/A/season ground and 33.6 fl oz. aerial. It is recommended that Scala is used in a tank mix with a labeled dose rate of another effective early blight fungicide

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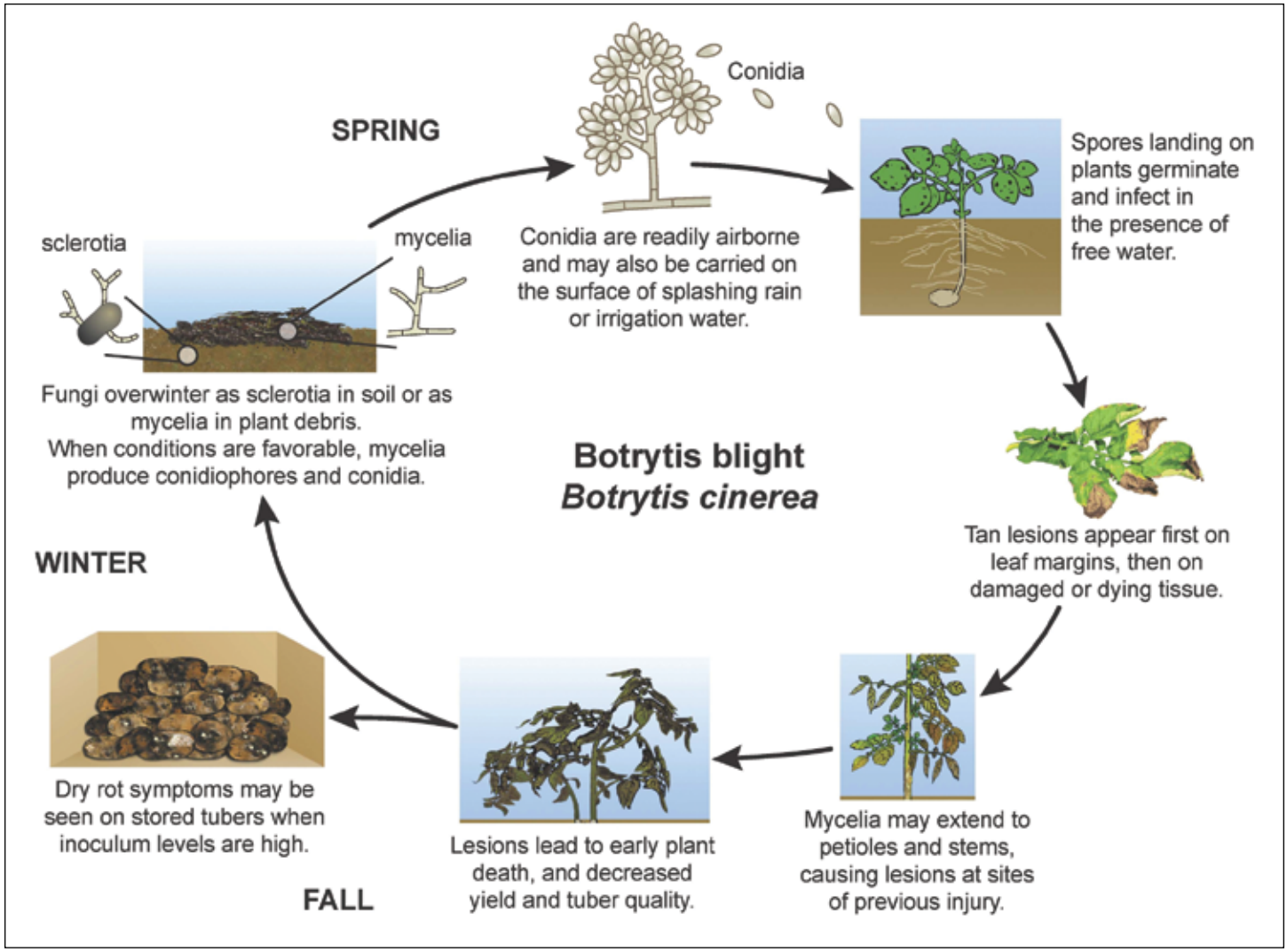

Figure 7. *Disease cycle of Botrytis blight.*