

Fruit Rots: Black Rot & Bitter Rot

Kristy Grigg-McGuffin
Horticulture IPM Specialist



Black Rot, *Botryosphaeria obtusa*

Frog-eye leaf spot

- Initially, purple flecks which enlarge to 4-5 mm (¼ inch)
- Margin remains purple but center turns tan to brown (“frog-eye” appearance)



Severely affected leaves turn yellow and drop



Telling the difference...

Frog-eye leaf spot




Spray burn





Black rot canker

- Requires wound (e.g., fire blight, cold injury, hail pruning, animal or mechanical damage) to infect
- First appear slightly sunken with reddish-brown or purple discoloration under bark
- Can enlarge to 0.5 m (18 inches) long



As canker progresses,
wood shrinks and bark
cracks or peels away



Eventually, wood turns black, more bark cracks and peels away

**Spore-producing fruiting
bodies develop in infected
tissue**



Cankers on

- Limbs – entire limb die back; may break under heavy fruit load
- Lower trunk - eventually girdle tree, resulting in death



Blossom or calyx end rot

- Early season fruit infections occur through sepals
- Other fungal pathogens can cause similar infection
- Tiny red flecks that turn purple surrounded by red rings on sepals
- Lesion develops from calyx end, forming concentric dark and light brown rings
- Grows into core resulting in premature drop



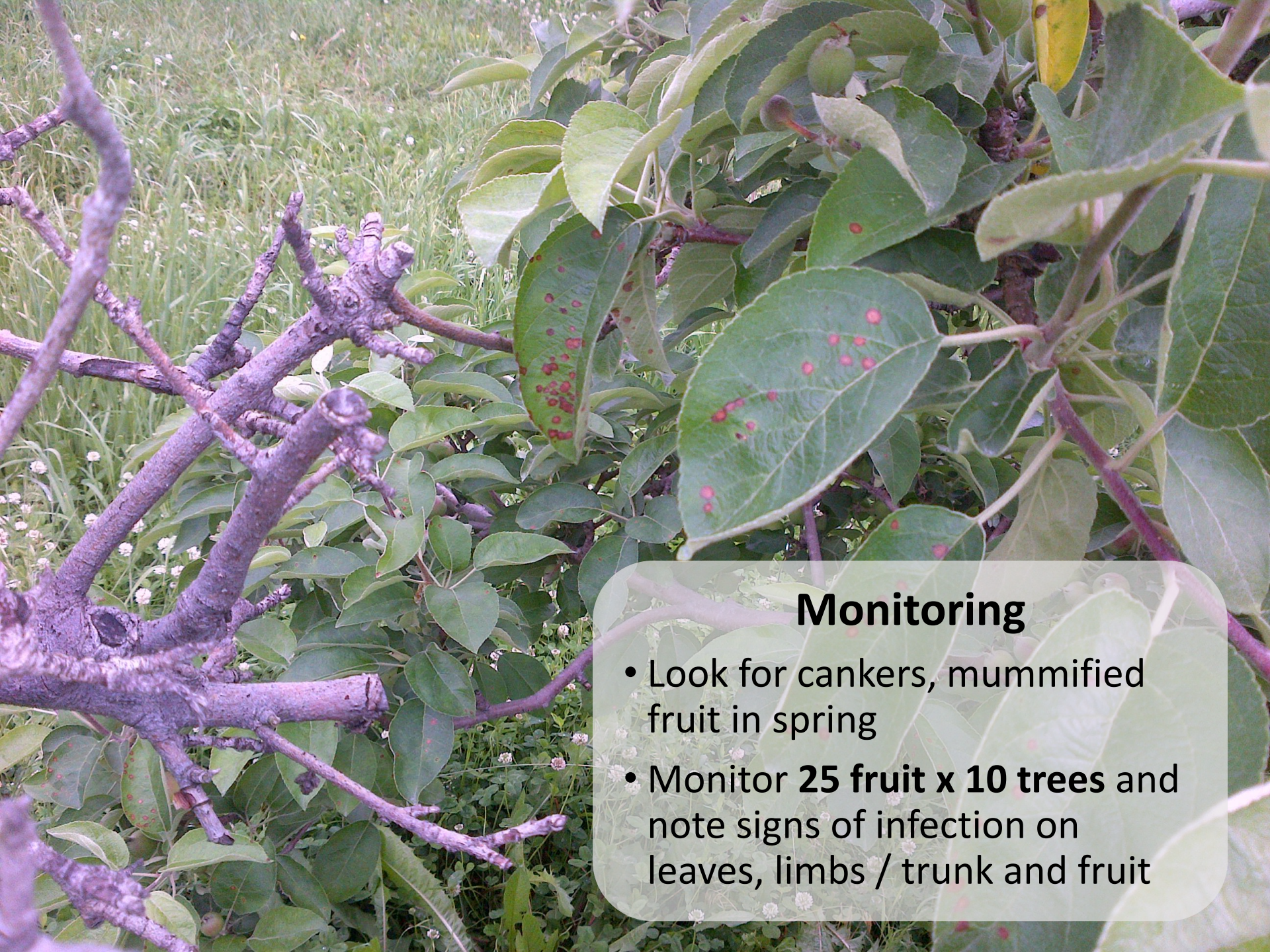
Fruit rot

- Red or purple flecks develop into sunken black spot surrounded by red halo
- Eventually concentric light and dark rings appear as lesion enlarges
- Fruit remains firm
- Black pycnidia (fruiting bodies) may appear on fruit late in season or in storage
- Mummified fruitlets often in close proximity – important source of inoculum for late fruit infections





- OW in cankers on hardwood trees and mummified fruit
- Cultivars which retain fruit mummies (e.g., Gala, Honeycrisp, Cortland, Northern Spy) susceptible, as well as trees damaged by winter injury or fire blight
- Infection can occur from **bud break** but peak release **4-6 weeks after petal fall**
- Leaf infection at 24-27°C with 4-5 hours of wetting; fruit infection at 20-24°C with 9 hours of wetting
- Risk of infection low below 10°C; no infection below 8°C



Monitoring

- Look for cankers, mummified fruit in spring
- Monitor **25 fruit x 10 trees** and note signs of infection on leaves, limbs / trunk and fruit

Management strategies for black rot

Cultural controls

- Select cultivars that are less susceptible where possible
- Prune out diseased or dead wood and burn / mulch
- Do not keep woodpiles near orchard
- Remove mummified fruit
 - Research shows chemical thinning at 6-8 mm fruit rather than 12-14 mm reduces number of mummified fruitlets

Chemical controls

- In orchards with history of black rot, initiate fungicide program at silver tip and continue on a 10-14 day schedule

Bitter Rot, *Colletotricum fioriniae*

- Tiny, sunken grey or brown spots
- Enlarge when fruit matures
- Red hollow may surround lesions on yellow skin varieties
- Sometimes confused with San Jose scale, bitter pit or lenticel breakdown







Lesions are sunken unlike black rot



Produce salmon-coloured spores in wet/humid conditions





V-shape rot progressing towards the core



- OW in infected or mummified fruit, cracks and crevices in bark, and cankers from other diseases
- Activity is **bloom until harvest**; however, symptoms typically mid to late season following **high temperatures** accompanied by **rain or thunderstorm**
- Spores rain-splashed to other fruit
 - **Does not require wound to infect**
- Infection prior to harvest can develop small lesions in cold storage which enlarge within a few days at room temp
- Monitor for signs of fruit rot, especially on high risk varieties from mid-summer to harvest



Management strategies for bitter rot

Cultural controls

- Prune out dead wood and old fire blight cankers
- Mulch infected fruit on orchard floor
- Remove mummified fruit from previous season
- Sun protectants to reduce fruit surface temperature and boost tree immunity



Chemical controls

- Apply fungicide on 10-14-day interval from bloom through to harvest, especially during favourable conditions



Thank You!

kristy.grigg-mcguffin@ontario.ca

519-420-9422

@AppleOfMyIPM