Bitter Rot and Sooty Blotch/Flyspeck Management

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Late June through harvest is the critical time for bitter rot management. Warm temperatures and rainfall are the ideal conditions for disease development.

Growers are encouraged to apply fungicides on bitter rot susceptible apple blocks before any rain event starting in late June. Management programs for bitter rot will also manage SBFS. Specific fungicide recommendations are described for the summer.

Bitter rot management

Bitter rot is one of the most important fruit rots to affect apple growers in the Eastern U.S. over the last several years. The fungus causing the disease is one of the few fruit rot organisms that can penetrate the unbroken skin of the fruit. When the spore penetrates the skin, the infection will then go dormant (quiescent phase) for a period of time. During this time, the spore does not grow and is not susceptible to fungicides. Consequently, fungicides need to be applied prior to the initial infection of the spore. Maturity of the fruit, temperature, humidity, and presence of disease are factors that determine when the quiescent period ends and the disease symptoms manifest.

Over the last several years, we have been studying how to best manage bitter rot. Our research to date has shown that the bitter rot spores are available all season long, most likely residing throughout the tree in buds and mummified fruit left in the tree. The spores are dispersed by rainwater and high disease pressure is favored by warm temperatures and prolonged periods of moisture.

Bitter rot management is needed from late June through harvest. Photo: Kari Peter, Penn State

We have shown that fruit are most susceptible to infection when these conditions are most favorable, which is typically from late June through harvest. During this period, growers are encouraged to apply fungicides before or during the infection period. We have studied all of the fungicides labeled for apples and have identified those that are best for managing bitter rot. Growers are encouraged to tank mix one of the following with captan (2-3 lb/A):

- Aprovia (FRAC 7; 30 day PHI)
- Omega (FRAC 29; 28 day PHI; Use at 13.8 fl oz/A)
- Flint Extra (FRAC 11; 14 day PHI)
- Luna Sensation (FRAC 7 + 11; 14 day PHI)
- Merivon (FRAC 7 + 11; 0 day PHI)
- Fontelis (FRAC 7; 28 day PHI; Use at 20 fl oz/A)

Be sure to rotate FRAC groups for fungicide resistance management. Growers need to keep in mind what was applied in the early season to manage apple scab since FRAC 7 and FRAC 11 fungicides, regardless if they are in a premix or by themselves, are limited to four complete spray applications per year.

Additional products can be added that have been observed to help with bitter rot management. Research in the Southeastern U.S. has shown the addition of phosphorous acid-based products (Rampart, ProPhyt, etc.) helps with bitter rot control. We are currently evaluating these products under PA conditions. We have also observed Regalia (1-2 qt/A) tank-mixed with a conventional spray application gives an added boost in protection, which would be most beneficial during seasons with frequent rain events, such as the summer of 2018. Organic options are limited. We have observed control using sulfur; however, sulfur

can cause fruit russeting when temperatures are at 80°F or higher. Bacterial-based products, such as Serenade and Double Nickel, have offered limited rot protection but have to be applied repeatedly since these products can be washed off easily. We are currently researching additional alternatives to increase the tools in the grower toolbox.

Sooty blotch and flyspeck management

Sooty blotch and flyspeck (SBFS) are additional summer diseases that can cause headaches for apple growers. The diseases often occur concurrently on the fruit resulting in surface blemishes that detract from fruit appearance, lowering fruit quality and market value. Sooty blotch also shortens fruit storage life because of increased water loss.

The fungi causing the diseases overwinter on the twigs of many woody plants as well as apple and pear. Spores of the fungi are windblown into and throughout the orchard; fruit infection can occur any time after petal fall but is most prevalent in mid-to-late summer. There are several disease models, which are variations on the original model published by Brown and Sutton (1995), to predict sooty blotch and flyspeck infection periods. For the Brown and Sutton model, leaf wetness hours greater than four hours starting 10 days after petal fall are counted. The threshold to start treatment begins approximately at 220 hours of leaf wetness. Luckily, we have a NEWA tool to help you determine when your fruit become susceptible based on your petal fall date and your last fungicide application date.

Sooty blotch (dark blotchy lesions) and flyspeck (small round black spots clustered) are cosmetic diseases, but decrease fruit quality and shortens fruit storage life. Photo: Kari Peter, Penn State

Disease outbreaks are favored by extended periods of above-normal summer temperatures combined with frequent rainfall and high humidity. These diseases usually appear on fruit late in the season. New infections can be observed as late as September. Regular captan (2-3 lb/A) applications are enough to manage SBFS. However, if there are frequent rain events occurring, growers are encouraged to add Topsin M (1 lb/A; 1-day PHI) to captan since captan can be washed off. During the 2018 season, there were a lot of issues with SBFS primarily due to growers only using captan and the captan getting washed off. The addition of Topsin will provide extra protection during very wet periods. In addition, the products recommended to tank mix with captan to manage bitter rot will also manage SBFS.

Organic options that have some efficacy include sulfur, Oso (4.5 fl oz/A), and bacterial-based products (Serenade, Double Nickel).

For commercial fruit growers, please note: When controlling for disease, weather and tree growth conditions need to be monitored at a local level within one's own orchard. To assist with management decisions (especially infection events), growers can use the NEWA website, which has weather stations all over New York. Before chemical products are applied, be sure to comply by obtaining the current usage regulations and examining the product label. Product information can be easily obtained from CDMS or Agrian.

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