Late Sanitation for Disease Management

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Fall has finally arrived, and with it, an excessive number of rainstorms and wet weather. Such weather can greatly favor late season diseases such as fruit rots and lead to the accumulation of inoculum for apple scab and Marssonina leaf blotch. While getting tractors into the orchards is still possible, there are opportunities to do some sanitation and significantly reduce disease pressure for next spring. It may be feasible to capitalize on any available labor that might be there for the harvest. Overall, fungal disease pressure was light in 2022, but there may still be some late season apple scab and Marssonina leaf blotch that could lead to increased disease pressure in the following spring. We've noticed that programs reliant on captan after 1st and 2nd cover with extended application intervals tend to have disturbingly high levels of Marssonina leaf blotch (Figure 1). The following are some inoculum reduction recommendations for both fungal and bacterial diseases.

Inoculum reduction recommendations for fall 2022.

Despite the relatively few infection periods for apple scab in the early 2022 season, late season rains may have been frequent and heavy enough to provide considerable overwintering inoculum for spring 2023. This overwintering or "primary inoculum" starts the epidemics we manage all season. Reducing this initial inoculum will delay the epidemic. In theory, if there is little rain early in the season, it could delay the epidemic to a point where it would be too dry and hot for the apple scab and Marssonina leaf blotch fungi to cause disease. Moreover, removing pruned shoots and fruit drops may greatly reduce the inoculum for fungal twig blights, and numerous fruit rot diseases, including bitter, black, and white rot. Inoculum reduction can be conducted in the spring, but if you have difficulty getting tractors in the orchard after the winter snow melt, it might be best to practice inoculum reduction during the fall. Implementing inoculum reduction in the fall affords both the fall and the early spring for decomposition of the leaf, twig, and fruit drops.

If the opportunity presents itself, take a final look at blocks that had shoot blight. While it is possible to remove fire blight during winter pruning, shoot blight and any larger cankers on infected limbs will be more visible while there are still leaves on the trees (it's easier to identify dead vs. dormant). When possible, select a cool day (< 70°F) and one where there is no rain predicted for the next 1-2 days. The pruned shoots and limbs can be left to dry in the orchard, even all winter, if necessary, but if you prune for fire blight first, you can sweep these up with the fruit drops and some of the additional leaf litter. Shoots with fire blight may also harbor wood decay fungi, including Nectria and Botryosphaeria, that can cause Nectria twig blight, and black and white rot of apples, respectively.

Once any remaining fire blight and fungal shoot blights have been pruned and swept, leaf litter can be targeted to reduce overwintering inoculum of apple scab and Marssonina leaf blotch. The two best options for inoculum reduction are to apply the urea to leaf litter or use a flail mower to shred leaves. These practices hasten the decomposition of the leaf litter. In the case of flail mowing, leaves should be first swept or raked from underneath the canopy into row middles, as most of the apple scab and Marssonina leaf blotch inoculum is present on litter under the trees (Figure 1). Subsequently, go over the row middles with the flail mower set to scalp the sod. If urea is used, apply 40 lbs. of feed grade urea per acre in 100 gallons of water to the herbicide strip (5% solution). Dolomitic lime applied at a rate of 2.5 tons per acre can be used in place of urea. Of the various options, applying urea is the simplest approach, but take care to flush the sprayer pumps with water afterward since the urea is caustic and can corrode a pump over time. As suggested above, the use of orchard floor urea may also reduce inoculum of other diseases (e.g., Bitter rot and Black rot) as it hastens the decomposition of leaf litter, fruit drops, and pruned shoots that harbor the pathogens causing foliar diseases, fungal shoot blights, and summer fruit rots. If orchard floor management was practiced in the fall with flail mowing or urea sprays, it wouldn't be necessary to repeat the practices this spring. Research from the University of New Hampshire has demonstrated that there are diminishing returns for practicing inoculum reduction in the fall and spring. Also, it's possible to safely apply urea when the trees are at 20% or more leaf drop. Urea is not an effective fertilizer and will not stimulate new growth or delay dormancy. If this is practiced, it would be exceptionally important to rinse the sprayer pump.

Summary

Late season inoculum reduction should begin before leaf drop by removing any remaining shoot blight and fire blight cankers while it's still possible to identify them. Secondly, sweeping and chopping to remove pruning and any remaining apple drops may reduce overwinter inoculum from many other late season diseases such as fungal tip blights and fruit rots. Finally, appling urea or using a flail mower will reduce leaf inoculum for apple scab Marssonina leaf blotch.

Figure 1. ‘Jonagold’ Tree with severe defoliation from Marssonina leaf blotch 6 weeks prior to harvest. This tree received no single-site fungicide applications after petal fall and was on 14-21 day intervals for summer fungicide applications.