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Tree Fruit Diseases - Brown Rot, Fire Blight, Root Rots

With peach season in full swing, mid-season management strategies are reviewed.

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Brown rot can cause shoot blight. (Photo: K. Peter)

Fire blight is still an issue due to continued tree growth thanks to the rain we have received. As a result of new growth on apple trees, growers need to be vigilant, especially when controlling for insects, such as aphids. The persistent wet conditions have also been an issue for root rot diseases on apple and growers need to be mindful of trees planted in heavy, poorly drained soils.

I thought Mother Nature was hazing me last year, but little did I realize she was priming me for this year. This year, she is laughing away as I try to do the Texas Two Step to keep up with all of the disease conditions she is throwing in our direction. The season has been unrelenting and there is no slowing down. This update covers a review on brown rot management strategies, why fire blight is still a headache for folks, and being alert for root rot diseases.

Peaches and nectarines: A review of brown rot management strategies

The fungus causing brown rot is quite opportunistic: it can kill blossoms and it can also ruin the fruit

you've worked hard all season to grow. Brown rot disease is favored by warm, wet weather, which has been occurring daily since mid-June. **Under optimum temperature conditions, fruit infections can occur with only three hours of wetness when inoculum levels are high. Longer wet periods during infection result in shorter incubation times so symptoms develop more rapidly.** I've heard reports that folks saw brown rot appear "overnight" on their fruit. This is not science fiction: this can happen. Brown rot can also cause shoot blight, which is due to spores getting into the shoot and subsequently girdling the shoot (see picture).

Spores produced on early maturing cultivars can fuel a continuing outbreak on late maturing cultivars - this is especially important for those who have battled rot infections already this season. To add another headache to the issue, insects can be important vectors of the fungal spores during fruit ripening: they can carry spores to injury sites produced by oriental fruit moth, Japanese beetle, green June beetle, and other insects that can injure fruit. Wounded fruit are much more susceptible to brown rot than unwounded fruit. **It's critical to be on top of insect management.** Under the right conditions, "healthy" fruit harvested can be contaminated and may decay later during storage.

Research at Rutgers has shown that **timing brown rot sprays 18 days, 9 days, and 1 day before harvest provided greater than 95 percent control under heavy disease pressure.** When following this regime, be sure to **rotate chemistries by FRAC Group Code number for resistance management.**

For example, one could spray the following (provided the maximum number of sprays has not been exceeded for that chemistry):

- 18 days: Fontelis (FRAC Group 7; 0 day PHI)
- 9 days: Indar (FRAC Group 3; 0 day PHI)
- 1 day: Merivon (FRAC Group 7 +11; 0 day PHI)

Other options to rotate:

- Topsin M (FRAC Group 1) + Captan (1 day PHI)
- Inspire Super (FRAC Groups 3 + 9; 2 day PHI)
- Orius/Elite (FRAC Group 3; 0 day PHI)
- Tilt/Orbit (FRAC Group 3; 0 day PHI)
- Quash (FRAC Group Code 3; 14 day PHI)
- Gem (FRAC Group 11; 0 day PHI)
- Captan (FRAC Group M4; 0 day PHI)

Keeping in mind products that were used to control blossom blight, be sure to be in compliance by obtaining the current usage regulations and reading the product label.

Alternative options for rot management

The key for growers who farm organically or prefer using alternative products is to **spray as often as possible as disease conditions persist, manage insects, scout often, and prompt removal of infected fruit as soon as you see it**. Spraying often ensures you have continuous protection; removing infected fruit from the trees ensures you are decreasing the amount of spores available to cause disease and hopefully minimizing an epidemic. This may translate spraying every few days, especially if rain washes off products. According to studies at Rutgers, sulfur is not effective for controlling brown rot. Some organic options labeled for brown rot control are Cueva, Double Nickel, Serenade Optimum, and Regalia.

Helpful brown rot resources from Rutgers

Dr. Norm Lalancette has posted three excellent articles in [Rutgers Plant & Pest Advisory newsletter](#) over the last two weeks about brown rot management during a wet growing season:

- [Brown Rot Management in a Wet Growing Season: Part I](#)
- [Brown Rot Management in a Wet Growing Season: Part II](#)
- [Brown Rot Management in a Wet Growing Season: Part III](#)

The headache continues: fire blight

Shoot blight still seems to be a big giant thorn sticking in everyone's sides as we are staring at the doorstep of August. Yes, this is quite unusual, but there is a very good reason: the trees have not stopped growing thanks to all of the rain we have been receiving since mid-June.

Remember: succulent shoots are very susceptible to fire blight; hardened off shoots as a result of Apogee or terminal bud set are immune to infection.

The weather we typically see in July is hot and dry. This gooses the trees to terminal bud set and shoot blight is no longer an issue: when the tree stops growing, the bacteria stop moving inside the tree. That is not the case this year. We have had a lot of rain and, as the trees have had the constant green light to "Grow! Grow! Grow!," the bacteria have been yelling "Go! Go! Go!" as they motor toward to the growing shoot tips. This is especially true for older trees experiencing canker (shoot) blight resulting from leftover cankers. If blight has struck, what should you do? Let's review

When fire blight symptoms manifest, spraying streptomycin is ineffective for disease control (unless after a hail event). In addition, using streptomycin during summer sprays can promote streptomycin

resistance. Copper, such as Cueva (which has shown to be less phytotoxic on apples), can be used if the shoot blight is originating from bacteria outside the tree and not from bacteria inside the tree (shoot blight via canker blight). The more appropriate question is: should you prune when you see fire blight? This is a tough question and the answer depends on the orchard and the weather conditions.

First things first: prune only in dry weather

There is a very high chance of spreading fire blight when pruning during wet weather, especially if the wet weather persists. Remove all blight showing within two days after it appears. If it will take much longer (tissue becomes brown and necrotic), focus efforts on salvaging trees where infections may threaten the main tree stem or where infections are occurring in the tops of the trees. Blight in the in the tops of the trees provide an infection source for the lower parts of the tree since bacteria can be "washed" down the tree.

Dr. David Rosenberger (Cornell) suggests a "fire blight triage" when it comes to pruning decisions once fire blight has struck, going from highest to lowest priority

- Young orchards 3 - 8 years old with just a few a strikes. (highest priority)
- Young orchards 3 - 8 years old with severe strikes.
- Older orchards with a few strikes.
- The "walk away" group: orchards with so many strikes that most of the tree would need to be removed; severe pruning can stimulate new growth that can become infected. (lowest priority)

If fire blight is to be pruned, use the "ugly stub" method by cutting branches between nodes and several inches away from the central leader or other branch union:

1. **Two year-old wood (and older) is more resistant to fire blight and can stop infection movement into the tree. Since the bacteria can travel inside the tree well ahead of the visible infection (up to several feet), make cuts 8 - 12 inches below the last signs of browning, leaving 4 - 6 inch naked stub in 2-year-old or older wood.**
2. A canker will form in the stub, which can be cut off with the canker during the next winter.
3. Disinfecting pruning tools is ineffective for minimizing spread of the disease since the bacteria often are present internally in mature bark well in advance of symptom margins.

Another important consideration for managing this late season shoot blight: control piercing sucking insects. Piercing-sucking insects, such as leafhoppers and aphids, can cause physical injury through normal feeding, thereby by creating an entry point into the plant. In two instances at FREC, we have observed young apple blocks with both fire blight and aphids feeding on the growing shoots. Could

the aphids be transmitting the fire blight? It's quite possible; however, the injury they are causing on the shoot tips is providing an open door to any bacteria that could be lurking on the leaf tissue.

Soggy soils and root rot

Another side effect of the high amount of rain this summer: root rot. I have observed several instances this year of trees dying from Phytophthora root rot. Phytophthora is a fungus-like organism that is capable of causing root rot and collar/crown rot, especially on sites with heavy, poorly drained soils. In addition, most Phytophthora species can live in the soil for 1 to 2 years. Root rot symptoms are distinct: the roots are decayed and are orange-brown in coloring. In addition, many have commented there is a strong "musty" odor associated with the diseased roots. The above ground symptoms are typical of a tree with a compromised root system: poor growth, dying leaves/limbs. Growers need to be mindful of orchards that have very clay soils, as well as areas that had previously been in an orchard since these microorganisms can hang around for a long time in the soil. Big, old trees are more tolerant; newly planted and young trees are not.; If you suspect root rot occurring in a young nonbearing orchard (dig up the tree and examine the root system), a Ridomil soil drench is your best option.

Commercial growers

When controlling for disease, weather and tree growth conditions need to be monitored at a local level within one's own orchard. Before chemical products are applied, be sure to be in compliance by obtaining the current usage regulations and examining the product label. [Product information can be easily obtained from CDMS.](#)