From conversations with growers and checking weather data, it seems that many locations received rain last night. Rain right after a hot day provides two of the required inputs for fire blight blossom infections. Other requirements are a population of fire blight bacteria in or near the orchard, open apple blossoms, and pollinator insects carrying bacteria to open flowers before heat unit accumulation.

The rain around midnight Thursday night – Friday morning was an exceptionally high risk fire blight infection period for apple blossoms that had opened by Wednesday morning May 17 even for orchards with no history of fire blight! For orchards that reached King Bloom by Thursday morning, the risk was still high. Technically, trees that came into bloom on Thursday with the heat are rated as being at high risk, but the actual risk MAY be mitigated by lack of time for insects to carry bacteria into blossoms before heat units accumulated to allow bacterial multiplication before the rain.

If your orchard fits into the risk scenario described above, and you didn’t already apply streptomycin today, then you should do so tonight if possible as the 24-hour window is open until roughly midnight. Given the lack of specificity around that pseudo-deadline, and the potential degree of risk, application out to 36-hours after the rain start may be worthwhile.

What if you did apply streptomycin on Friday May 19, what is your risk for the rain in the forecast for early Monday morning May 22? Assuming that a streptomycin application on Friday morning reset the bacterial population to near zero, then the accumulation of heat units before a Monday morning rain would also be reset to zero to assess risk from that rain.

For Sanford area orchards that reached King Bloom on May 11, ~100% Petal Fall for McIntosh and developmentally similar cultivars should be reached by the end of Saturday, May 20. This is more than a full day before that Monday morning rain forecast start time. That still leaves potential for late cultivars or straggler blossoms to still be present. For Monmouth area orchards, apple trees will be in Full Bloom. Therefore, in terms of available blossoms, the risk should be relatively low in Sanford but full blown in Monmouth.
Using Monmouth hourly temperatures, the number of heat units on Friday, Saturday, and Sunday are well below the threshold for developing another high risk infection period by Monday morning. So if you did apply streptomycin on Friday, and if the assumption that a streptomycin spray resets the bacterial population growth curve to zero is accurate, then a Monday morning rain appears to pose little risk.

What if you did NOT apply streptomycin on Friday May 19? In that case, you don’t have a reset to zero on Friday working in your favor. Then the question becomes, does the massive amount of heat units on Thursday May 18 count towards infection risk, OR, will any flowers that were open on Thursday be aged-out and beyond susceptibility by the time of a Monday morning rain?

The answer is ... maybe, but I wouldn’t take the chance. The problem with the models as currently constructed is that they assign daily values to a disease that operates on an hourly time scale. The average duration of a flower’s vulnerability is about 4 calendar days. More specifically, about 80 degree days (using a base temperature of 40F).

Crunching the observed and forecast hourly temperatures for Monmouth and counting backward from an estimated 3am start time for the rain on Monday morning, then any flower that opened before 1am Friday morning May 19 would be too old to be susceptible to blossom infection when rain started on Monday morning. If you were an optimist, you could interpret that as saying it gets you off the hook for the Eastern fire blight model. But not really...

When you use a model you have to play by the rules used to develop it, specifically the threshold values used to estimate risk. When operated on a daily time step, the Eastern fire blight model includes heat from any day that falls within that 80 DD40F window, not just from those hours that fall within the 80 DD40F window. Playing by those rules, then, a rain on Monday morning counts as an infection period.

The Cougarblight model uses a fixed rolling 4-day accumulation. Counting back 96 hours from Monday May 22 at 3am means that you start accumulating Cougarblight heat units on Thursday May 18 at 3am. The massive heat unit accumulation on Thursday tells the model that 640 heat units count towards the infection risk.

That is a lot. The heat unit threshold for an orchard with some history of fire blight within the last two years (category II in the Cougarblight model) is 200 for HIGH risk, 350 for EXTREME!, and 500 for EXCEPTIONAL!

The heat unit threshold for an orchard with no previous history of fire blight within 1 mile of the orchard within the last two years (category I) is 500 for HIGH risk, and 800 for EXTREME!

The bottom line is that if you did NOT apply streptomycin on Friday, it would be prudent to make an application before the next rain if it is forecast to occur before 8am on Wednesday May 24 AND you still have open blossoms in the orchard.
The rain on Thursday night – Friday morning was only enough water to release a portion of mature ascospores. In addition, the rain only occurred at night and the wetting period was only long enough for spores released at night. Even with a soaking rain, only 5% of available spores will release at night. Because of the light rain in the dark, only about 2% of the available spores released and had time to cause infection. The resulting infection potential would be negligible in a low scab orchard. In a high scab orchard, any speck of rain during bloom is a significant event.

That rain forecast for early Monday morning May 22 would bring over half of the year’s total primary scab infection potential in one event for the Monmouth area. Apple trees for which fungicide protection was last updated before Wednesday morning May 17 at 6am should receive renewed protective coverage before that Monday morning rain.

Protectant fungicide alone should be sufficient if applied correctly. Given the concentration of scab infection risk, a combination of protectant fungicide with one of the locally systemic materials with postinfection fungicides would provide additional assurance.

Scab risk concentration for the Sanford area is not as extreme, but a Monday daytime rain there would still account for 35% of the year’s total primary scab infection risk.

"If you keep your feet firmly planted on the ground, you'll have trouble putting on your pants.

~ Anonymous