Managing Fire Blight in Young RubyFrost Plantings

Deborah I. Breth
Cornell Cooperative Extension – Lake Ontario Fruit Program

In 2011, active fire blight (FB) infections were noted late in the season, several of which were resistant to streptomycin in lab screenings. This intensified the search for FB infections in 2012 and again in 2013. During these seasons, due to the number of grower calls and samples of fire blight collected in new plantings and nurseries of RubyFrost (then NY-2), it became apparent that RubyFrost appeared to be highly susceptible to fire blight. In 2012, there were nine farms which submitted NY-2 samples for strep testing, 2 for NY-1, but to put it into perspective, second only to 14 farms which submitted Gala samples. In 2013, there were 10 farms which submitted NY-2 samples for strep screening, 8 farms with Gala infections, and 4 farms with FB infections in NY-1. We assessed tree losses in 2013 in 3 new plantings with NY-2 and Gala or other cultivar. The infections were counted by row of the total trees per row in June when symptoms were progressing; only one planting was followed later in the season with a significant increase in the number of infected trees by September. Comparing RubyFrost to Gala, SnapDragon, and Pizzaz, there is consistently higher risk of fire blight infection in young RubyFrost.

2013	Variety	# Trees	Infected	%
	RubyFrost	2079	116	5.6
Farm 1 - Jun 12	Gala	1573	40	2.5
	RubyFrost	2095	106	5.1
Farm 2 - Jun 21	Gala	2077	51	2.5
Farm 2 - Sept 25	RubyFrost	683	543	79.5
	SnapDragon	2104	6	0.3
	RubyFrost	1261	116	9.2
Farm 3	Pazazz	1410	15	1.1

Why is it susceptible to FB? RubyFrost is a hybrid of Braeburn (highly susceptible to FB) and Autumn Crisp (susceptible to FB). So with 2 parents that have a high risk of fire blight infection, we expect RubyFrost to follow suit.

But what does "susceptibility" mean? Does it have a prolonged, heavy bloom in the first leaf in the orchard and, therefore, a longer window for blossom infection? Or is because there are so just so many blossoms that provide more opportunities? RubyFrost can be a very vigorously growing cultivar. So is it because RubyFrost is vigorous and the succulent shoot tips are exposed for a longer period during the growing season? Is it more susceptible because the infections extend past 1 year old shoots? Is RubyFrost more susceptible than many other cultivars? Gala. Topaz, Braeburn all have a reputation for being very susceptible to FB. Since there are no comparative tests including RubyFrost there is no relative rating of susceptibility. <u>But, the bottom line is that RubyFrost is susceptible or highly susceptible to FB as all cultivars are susceptible given the right conditions for disease.</u> The presence of the bacteria, the susceptible host plant, and the right environmental conditions result in disease, and in this case, tree losses.

Here is a step-by-step system that must be followed to reduce the risk of tree losses when planting RubyFrost or other FB susceptible cultivars.

GUIDELINES FOR ON-FARM NURSERY PRODUCTION (Aldwinckle, Breth, Carroll, and Cox)

1. Collect budwood from orchards where fire blight is not established or from a neighboring farm without fire blight.
2. Limit streptomycin applications to 2-3 per season. These should be timed according to a disease forecast model prediction or CCE alert.
3. Before conducting tree management tasks in nursery apply a copper product at the lowest labeled rate and observe the labeled REI. When fire blight pressure is high and shoots are actively growing, apply copper at the lowest labeled rate to prevent shoot blight.
4. If fire blight is established in a nursery, completely remove the infected trees including the root system, and place them in trash bags between rows. Subsequently, remove the culled trees from between the rows and discard them. Under no circumstances should unbagged infected trees be pulled between nursery rows for removal, otherwise fire blight will be spread down the rows.
5. Control potato leafhoppers in nursery using a neonicotinoid product registered for use.
6. Maintain weed control though cultivation. Apply registered post-emergence herbicides using a shielded boom. There are some residual herbicides registered for use in nurseries.
7. When working in the nursery, field workers must wear clean clothing, and should wash hands and disinfect working tools often.
8. Any pinching, leaf twisting, or other manipulation that can cause wounds in trees should be done on dry, sunny days with low relative humidity, after the REI of a copper application has expired.
9. When trees have reached the desired height, consider applying the lowest labeled rate of Apogee to slow growth and reduce susceptibility to shoot blight.
10. Manage nitrogen levels to balance tree growth and fire blight susceptibility.

RECOMMENDATIONS FOR NEW PLANTINGS (1-2 years) (Aldwinckle, Breth, Carroll, and Cox)

1. If possible, plant varieties grafted on fire blight-resistant rootstocks.
2. Trees should be carefully examined for fire blight infections before planting. Infected trees should be discarded. Samples should be submitted for strep-resistance testing. Contact CCE for SR Ea testing.
3. Immediately after planting, and 14 days later, a copper application should be made. Ensure that soil has settled to avoid phytotoxicity to roots.
4. Trees should be scouted at 7-day intervals for fire blight strikes until July 31st. **Infected trees should be removed** as described above. Plantings also need to be scouted 7-10 days after hail or severe summer storms. The NEWA disease forecasting models for fire blight (http://newa.nrcc.cornell.edu/newaModel/apple_disease) can assist by providing an estimate of symptom emergence following a storm or other trauma event. Also scout the planting at the end of the season (mid-September).
5. If possible, remove flowers before they open. New plantings may have considerable numbers of flowers the first year, and blossom removal may not be practical. If practiced, the blossoms should be removed during dry weather and before there is a high risk of fire blight infection.
6. Trees should receive an application of copper at a stage equivalent to bloom. Observe the labeled REI before blossom removal.
7. To protect any remaining bloom, apply one of the following tank mix options:
    a. The highest labeled rate of copper prior to infection,
    b. or oxytetracycline and streptomycin at highest labeled rates,
    Note: oxytetracycline only has activity when applied before an infection event. Therefore, monitor fire blight forecasts and heed CCE alerts carefully when using oxytetracycline.

c. or a bloom time rate of a registered copper product (before infection) and the highest labeled rate of streptomycin,
Note: An example would be Badge SC at rate of 0.75 to 1.75 pints /acre buffered with 1-3 lbs. of hydrated lime for every 2 pints of Badge to minimize fruit finish damage.

8. Any pinching, leaf twisting, or other manipulation that can cause wounds in trees should be done on dry, sunny days with low relative humidity, after the REI of a copper application has expired.
9. When trees have reached the desired height, consider applying the lowest labeled rate of Apogee to slow growth and reduce susceptibility to shoot blight, although how this will compare to the FB suppression of shoot blight using the full rate is unknown and should be tested.
10. Manage nitrogen levels to balance tree growth and fire blight susceptibility in this very vigorously growing cultivar. There is research that shows that maintaining a balance with N, K, Ca, and Mg are all contributing factors in FB risk.

Deer control will obviously be essential in these plantings! Deer will actively feed on succulent shoot tips in new orchards, and we have seen the spread of fire blight right down the row! Before the deer find the trees, it will be critical to fence the orchard or apply other deer repellent treatments not only to prevent the spread of fire blight, but to preserve tree structure and growth so potential yields will not be reduced.

Summary:

Managing RubyFrost to minimize fire blight will be just like managing fire blight in any other very susceptible varieties. Growers report that "after the trees settle down to bear fruit, they appear to be much less susceptible." But in the meantime, the nursery and new plantings must be managed at a high level of supervision so the new trees can survive the first season in the orchard.