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Alternative Controls for Fire Blight – 2014 Update

2014 is the last season in which organic apple and pear growers can use antibiotics to control fire blight. Now is the time to look at non-antibiotic controls, for which there has been significant progress in the past few years.

Two new resources are available this spring for growers. An [annotated presentation](#) by Dr. Ken Johnson of Oregon State University outlines possible control strategies and shares results of the most recent research on coppers, oils, lime sulfur, and biological materials. A new Critical Issue Report from the Organic Center, "[Grower Lessons and Emerging Research for Developing an Integrated Non-Antibiotic Fire Blight Control Program in Organic Fruit](#)," by Harold Ostenson and David Granatstein, describes what Washington organic fruit growers in the EU program have done historically to manage fire blight and how new control options can be integrated into a systems approach.

From the abstract, "Successful non-antibiotic fire blight control centers on combining orchard management practices into an integrated systems approach which is multi-faceted, and marries effective fire blight prevention with fungal control, insect control, bloom thinning, spray coverage, tree training, soil and foliar nutrients, and cultivar and root stock selection."

The report goes on to discuss each of these facets, as well as some overall management considerations. Each grower will need to adapt the principles and strategies to their own particular location and type of operation. It is especially useful that detailed timing recommendations are given separately for apples and for pears. The publication has extensive references and suggestions for further reading.

Focus on Pears

In California, there is particular risk to pear trees from fire blight (FB) for a number of reasons, so the rest of this blog entry will cover some of the findings on pears from the resources above. Pears are often grown in warm areas with high humidity from rainfall or fog, which are ideal conditions for fire blight. Pears are more sensitive to fruit russeting than apples and are very subject to fruit marking when lime-sulfur or copper sprays are used after bloom, thus limiting the choices of materials against fire blight. They are subject to "rat-tail" bloom, which prolongs the bloom period in warm conditions and makes control more challenging.

The importance of combining the spray materials discussed here with good cultural controls in an integrated program cannot be overstated. The use of FB prediction models in areas where such models are available is one key practice. Fall or winter sanitation sprays of oil or copper, or painting cankers on tree trunks in late winter with these materials can help dry up cankers before spring growth starts. Time-tested practices are important, like pruning for good air circulation, crop load management, properly sized and calibrated spray equipment, and tree nutrition. It is advisable to apply pre-bloom



foliar nutrient sprays if possible because they accelerate tree leaf expansion and shorten the bloom time, hasten fruit set, and therefore reduce exposure to fire blight infection. This leads to larger fruit than applying more nitrogen to the soil and reduces excess vigor that can lead to increased fire blight damage.

According to Ostenson and Granatstein, "Without antibiotic use, integrated FB control measures will need to be more intense in the pre-bloom stages in an attempt to reduce FB bacterial growth potential in the bloom window as much as possible." In many cases, growers will be trying to integrate the FB control program with control of pear psylla, pear scab and mildew, and overwintering mites or mealybugs. Fall applications of the same materials applied in spring may help improve the outcome of spring control efforts.

Because certain pear varieties are very prone to russet, it is best to spray these at the early bud stage (up to tight cluster) with the strongest materials at high volumes of spray. Oil with copper or lime sulfur (on the varieties it is registered for only) can be used. Soluble copper, such as Cueva, can be a protective spray at tight cluster stage for mildew, scab, and FB. This action can reduce the number of flower nectary sprays required later and reduce the russet potential.

From the first white stage through 50 percent bloom, emphasis needs to be on organic biocontrol materials. The idea is that early sprays of copper will have retarded the FB growth during bud development so that now biological materials can colonize flower cups when russet is an issue. "Integrated control" involves applying materials that inhibit pathogen growth on the stigma in sequence with those that suppress its activity on the nectary. Materials such as BloomTime™, Blossom Protect™, or Serenade Optimum™ are all possible choices depending on humidity levels and weather.

At full bloom stage the flowers are the most susceptible to FB. It is also a critical window for controlling scab and mildew. In russet sensitive varieties, Blossom Protect™ followed by Serenade Optimum™ has shown the least russet in recent research, with the Serenade reducing the yeast population by up to 40 percent. This is a good strategy if there is extended wet weather at bloom.

During petal fall and post-petal fall, control strategies are complicated by warmer temperatures, new foliage growth that makes spray coverage more difficult, and emerging populations of other pests. Weekly full-cover sprays may be needed in some areas for thirty days after petal fall to impact extended "rat-tail" bloom and to avoid shoot blight. Serenade™ or DoubleNickel™ may be considered for this.

Please note that the above references to pest control materials are not formal pest control recommendations but are ideas for growers to use in formulating their own program. Always check labels and make sure products are registered before using.

Some additional promising materials are being researched and will become available in the next few years; meanwhile, growers need to start learning to work with the products and techniques available now in order to remain certified organic without relying on antibiotics in the future.

