



FACT SHEET

Management of fire blight using the “2+2” non-antibiotic Program

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Fire blight is a devastating disease of apple and pear. The current control relies on the sprays of antibiotics (streptomycin, oxytetracycline and kasugamycin). However, this approach is limited by the development and spread of streptomycin resistance and the increasingly stringent pesticide regulations. We present the protocol of a newly developed “2+2” program using the biological control agent Blossom Protect and the organic biopesticide Oxidate. This program has been tested effective in multiple growing seasons at the CT Agricultural Experiment Station on apple.

Description of the control materials used in “2+2”:

Blossom Protect is a yeast-based biological control with two *Aureobasidium pullulans* strains DSM14940 and DSM14941 being the active ingredients.

Preparation of Blossom Protect

Tank mix 1.25 lb of Blossom Protect with 5 lb of Buffer Protect NT, in 100-150 gallons of water, for 1 acre of crops.

Timing of Blossom Protect applications:

1st application: Apply Blossom Protect when trees reach 60% bloom (approximately 60% of flowers are open). **2nd application:** Apply Blossom Protect when trees reach 80% bloom (approximately 80% of flowers are open).

The two timings do not need to be strict; they could be 50% and 70%, or 40% and 90%, as examples. But ideally, two applications of Blossom Protect will give the best control

results. However, if you can only make one application due to practical restrictions (swamped with so many sprays, flowers blooming too fast due to warm weather), 1 application of Blossom Protect is OK, time it around 80% bloom.

Preparation of Oxidate 5.0

Dilute Oxidate 5.0 in water with a 1:256 ratio (e.g. 50 fl oz of Oxidate 5.0 per 100 gallons), and apply 100-200 gallons per acre. Do not tank mix Oxidate with anything unless communicated with Quan.

Timing of Oxidate applications:

1st application: Apply Oxidate at full bloom (approximately 100% of flowers are open). **2nd application:** Apply Blossom Protect when trees at petal fall.

Do not apply Oxidize right after Blossom Protect. Apply 1-2 days after the last Blossom Protect application. Applying Oxidize right after Blossom Protect or tank-mixing Oxidize with Blossom Protect risks killing the biocontrol yeasts in Blossom Protect and compromising the control effect.

Ideally, two applications of Oxidate will provide the best control results. However, it should still have OK efficacy if you can only make one application at or before petal fall (2 days or more after your last Blossom Protect application).

Compatibility of Blossom Protect with fungicides:

Blossom Protect is a yeast therefore may be susceptible to many fungicides used for apple scab control.

Blossom Protect can not be tank mixed or used 3 days before and after with the following fungicide groups: FRAC M (such as Captan, Mancozeb), FRAC 11 (such as Flint, Sovran), and some FRAC 7 (such as Aprovia).

Sulfur and contact sterilants can also kill the Blossom Protect yeast. Do not apply these fungicides within 2 days of Blossom Protect applications. Potassium bicarbonate is compatible with Blossom Protect yeast and can be 24 hours after Blossom Protect application (1 quart of potassium bicarbonate powder per 100 gallons of water).

If conventional fungicides have to be used, apply Captan right before the petals open, so the green tissues are protected, but the internal flower parts don't receive the fungicide. Then apply Blossom Protect 2 times at 50-80% bloom, then Oxidate 2 times at full bloom and petal fall. Captan and other fungicides can be used at or after petal fall as far as it is 3 days after the last Blossom Protect application.

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