

# Blossom Protect™ is as Effective or Better than Antibiotics for Fire Blight Control

In a March 2014 round table discussion on fire blight, Tina Koenemann, President of Westbridge Agricultural Products, speaks with Dr. Larry Parker, Director of R&D, and Dr. Andy Hudson, Plant Pathologist & Senior Research Scientist, about the benefits of Blossom Protect™ for effective control of the disease.

## Excerpt from the discussion:

TK: There is a question whether the use of **streptomycin** to control fire blight will be allowed for use in **organic apple and pear production** beyond November 2014. The fire blight bacteria can and is becoming resistant to antibiotics, but are there enough tools to control fire blight disease without them? What are the main issues and how can Blossom Protect help?

AH: There are several issues with using antibiotics to control fire blight in pome fruit, the first being antibiotic resistance. Resistance to antibiotics by *Erwinia amylovora*, the pathogen that causes fire blight, is well documented. There is also the potential for human resistance to superbugs, which is a health concern. As for Blossom Protect being able to take the place of antibiotics, we have consistent results that show, year after year, the product is comparable with antibiotics. We are right in the **85-95% control of fire blight**, either as a stand-alone product or rotated with organically approved materials, such as soluble coppers.

TK: What is the **mode of action** in Blossom Protect and how does it work?

AH: The active ingredient in Blossom Protect is *Aureobasidium pullulans*, a yeast-like fungus in the ascomycete group, which essentially out-competes the fire blight bacteria for space and nutrients. To be effective, Blossom Protect must be on the plant in sufficient population levels before the pathogen



Dr. Larry Parker, Dr. Andy Hudson, Tina Koenemann

is present. Multiple applications are needed to protect new tissue from exposure, since new tissue that develops after an application will not be protected. **Buffer Protect** is an adjuvant that accompanies Blossom Protect. It helps to optimize the tank mix solution for Blossom Protect's active ingredient, helping it survive and prosper within the flower.

Blossom Protect doesn't affect the pathogen directly so there is no risk that the pathogen will become resistant. Resistance usually results when the pathogen becomes immune to a pesticide. Antibiotics affect the metabolism of the pathogen at one step in a pathway. Circumvent that step, and you have resistance. Blossom Protect aggressively competes for space and nutrients, so the pathogen must try to grow in a desert-like environment. There is no food source for the pathogen and no space for it to grow. Without these, the pathogen cannot survive. The thing to keep in mind about the fire blight pathogen, is that its populations will build in the blossom until they reach a critical population level. Once they reach that level, they can effectively cause infection in the plant. Prior to

hitting that population level, they are just an epiphyte. Blossom Protect can keep the pathogen from hitting population levels that are sufficient to cause disease.

TK: Is this product just for organic growers or is there a fit for conventional apple and pear production?

LP: Blossom Protect is excellent for **organic and conventional growers** in integrated pest management programs. A successful program will rotate pesticides with different modes of action. The extensive use of one product will result in the pathogen becoming resistant to that product. Blossom Protect is an excellent tool you can use to reduce antibiotic dependency, so antibiotics can be saved for when they are needed.

TK: So Blossom Protect is compatible with antibiotics and other products that are used in controlling fire blight?

LP: Yes, Blossom Protect can be **tank-mixed** with all the current registered antibiotics, and also with a number of different chemical fungicides that are used for controlling apple scab. Blossom Protect can be used before and after

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coppers, so it is an excellent product in an integrated pest management system.

TK: What about **bee safety**? There's a lot of talk about bee decline. Is this product safe for bees?

AH: Blossom Protect has no effect on bees, whatsoever. This particular yeast-like organism (*A.pullulans*), was isolated originally from apple orchards. It is found in nature and part of the ecosystem on pome fruit. Bees are interacting with *A. pullulans* on a regular basis, whether or not Blossom Protect was applied in that orchard. It is part of the indigenous flora.

TK: Does Blossom Protect stay active in the orchards once it's been applied? Or does it require multiple applications?

LP: Blossom Protect requires multiple applications because it needs to be colonizing the new flowers as they open up. Under ideal conditions, it requires a minimum of three applications. But if you are using fire blight models like Cougarblight or Maryblyt, you might be able to get by with one or two applications, depending on the model. The grower needs to apply the Blossom Protect before conditions are optimal for the fire blight pathogen to grow.

TK: Blossom Protect is an EPA registered product approved for certified organic production. What are the application timings? Larry mentioned the Cougarblight and Maryblyt forecast

models, but when is the product actually applied? Right at flowering?

AH: We usually start at about 10-20% bloom and continue through the bloom stage. We do not apply at petal fall or later, as there may be, under severe environmental conditions, a potential for russet. The number of applications is dependent on the bloom window. We've seen blooms go from 0-100% bloom in two days. You're not going to be able get an application out in that case. However, in an ordinary bloom window of 7-10 days, we suggest three or four sprays.

LP: We want to make sure that we get an application on between 70-90% bloom. We found as the season progresses, it typically gets warmer and conditions become more suitable for fire blight to occur. It is crucial to have an application during that time to get maximum fire blight control.

TK: There's been a lot of research done with this product in university and field trials, and with some of the other products that are compatible with Blossom Protect. Are there instances where you may not be able to tank mix Blossom Protect with the other products?

AH: I would not recommend tank-mixing some of the copper products with Blossom Protect and Buffer Protect, because of the lower pH. Copper in acidic conditions is phytotoxic. There



*Blossom Protect is safe for bee colonies*

are issues because the copper is not in the right environment. But a sequential application with copper will not have any negative effects. In fact, following the Blossom Protect application with a copper application later on in bloom, has given us phenomenally good results. Better than streptomycin standards.

TK: Because this is a living organism, are there any special requirements for **storing Blossom Protect** prior to use, and what is its shelf life?

AH: It should be refrigerated to get maximum shelf life, which is two years. If you don't have refrigeration, you want to at least keep it in a cool warehouse. Most high ceiling warehouses will be sufficient for storage for nine months.

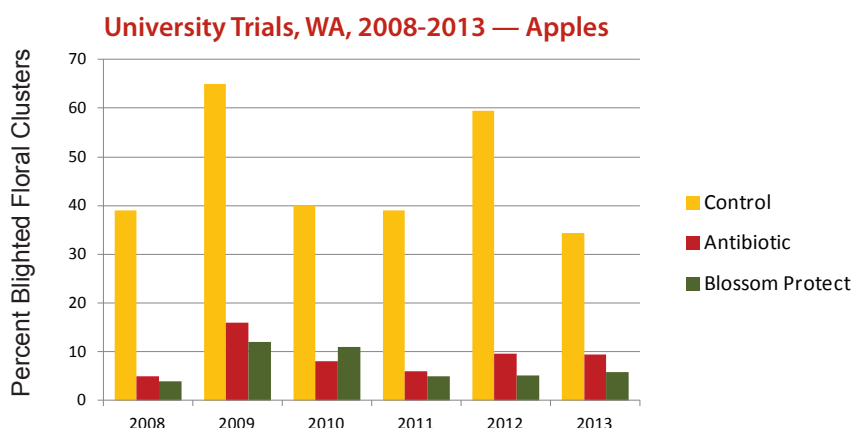
TK: How is Blossom Protect packaged and why must it be used with Buffer Protect?

AH: Blossom Protect is an easy-to-use water dispersible granule that comes in a 2.5 lb package. It must be sold with Buffer Protect at a one part Blossom Protect to seven parts Buffer Protect ratio. This is important because Buffer Protect modifies the environment to favor Blossom Protect, providing optimal efficacy and maximizing consistent performance.

TK: Where can the grower purchase Blossom Protect?

LP: Blossom Protect is available through **leading agricultural distributors** in most apple growing regions in the U.S.

Blossom Protect was approved by the EPA in 2012. Prior to registration, researchers tested the product for 4 years. Trials have continued and Westbridge now has 6 years of data showing excellent control of fire blight.



\*Always use Blossom Protect™ with Buffer Protect™ to optimize efficacy

