

# **COMPANION® BIOLOGICAL FUNGICIDE AVAILABLE IN LIQUID OR WETTABLE POWDER** Strength in Numbers, Control Blossom and Shoot Blight from Fire Blight

Companion® is known as the first liquid biological fungicide product introduced to prevent, control and suppress a broad range of root /soil borne and foliar diseases of agricultural crops. Companion® liquid or WP can be used either as a stand-alone product or in combination with phosphites to reduce Fire blight (Erwinia amylovora) on apples and pears by over 76%. Companion's active ingredient Bacillus subtilis GB03 has been studied by over 100 universities in the US and internationally and has set standards that other biologicals are attempting to match. Companion® has multiple modes of action to fight bacteria, viruses and fungi. Companion® not only destroys the actual pathogens, but activates the plants natural defense system, termed Induced Systemic Resistance (ISR).

With over 55 billion spores in each gallon of Companion®, you have strength in numbers that quickly colonize the blossom clusters and shoots of apples and pears, killing the pathogen and boosting the tree's immune system to fight off diseases.

Active Ingredient	Mode of Action	Group Name	FRAC Code*
Bacillus subtilis GB03	Antifungal, lipopeptides, Antibacterial compounds, stimulates root and plant growth, productivity.	Microbial	F6 Microbial disruptors of pathogen cell wall. Induction of host plant defense described as additional mode of action ISR

# **Key Features and Benefits:**

# **Triple Mode of Action**

• Destroys pathogens, inhibits spore germination and boost the plants natural defense system.

# **Effective Protection**

• Use as a stand-alone application, as a tank mix with reduced label rates of fungicides or in rotation with pesticides

# **IPM Integrated Management Tool**

• Effective addition to an Integrated Disease Management Program.

# **Resistance Control**

• No known resistance development because of multiple modes of action and ISR.

# **Flexible Application**

- Use as a soil drench or foliar application. Tank mix with insecticides and fungicides.
- Four-hour REI
- Zero-day pre-harvest for late season diseases, up to and including the day of harvest.

# Exempt from MRL (Minimum Risk Levels)

- Safe for human exposure with no adverse risk to workers
- Exempt from the requirements of residue tolerance.

\*FRAC (Fungicide Resistance Action Committee) Resistance not known.



# Integrated Control Strategy – Increased Protective Effect Against Blossom and Shoot Blight...

# **Coscia Pear Study**

#### Moulay Ismail University, Meknes, Morocco

Companion<sup>®</sup> Biological Fungicide is a natural alternative to antibiotics and copper for control of Fire blight. Trial results in both the US and overseas confirm that a program combining Companion<sup>®</sup> and plant defense activators (PDA) have a synergetic effect that can overcome inconsistent efficacy with standard products and is a viable alternative to enhanced level of disease control.

This three year in depth trail studied Fire blight in a commercial pear orchard (var. Coscia) on both shoots and flowers comparing the efficacy of Companion<sup>®</sup> biocontrol agent alone and in combination with plant defense activators such as fosetyl aluminum (F-AL) and potassium phosphite, applied individually and in combination on both blossom and shoots. Two sprays were done.

Treatments with biocontrols and plant defense activators significantly reduced both the blossom and shoot blight incidence. The spray with the potassium phosphite alone reduced the infected flowers by 43%. However when Companion<sup>®</sup> and potassium phosphite were combined disease control was increased to 70%. Likewise the combinations of Fosetyl yielded the same significant disease reduction on flowers. The rate for Companion<sup>®</sup> was 5 ml/1 L (64 oz. per 100 gal)

# Combined treatments of Companion<sup>®</sup> with all PDA products reduced the disease severity an additional 59% to 76% on both blossoms and stems.

#### Companion<sup>®</sup> Biological Fungicide:

- Increases plant protection
- Reduces necrosis that forms as disease progresses
- Limits ooze formation
- Reduces competition to pathogen and antibiosis
- Induced Systemic Resistance (ISR)
- Provides an alternative to antibiotics and copper

# Fire Blight Facts and Management:

- Fire blight symptoms usually emerge when temperatures reach 75 85 degrees
- Treatments should be applied in early Spring before temperatures rise
- Trim diseased branches only in Fall or Winter
- Increase irrigation in warmer months to keep trees well-hydrated



Fire Blight Damaged Tree



**Healthy Tree** 

# **Coscia Pear Study**

Moulay Ismail University, Meknes, Morocco



(Plant Defense Activators)

#### Fire Blight in Coscia Pear Tree Flowers 2016



The devastating effects of Fire blight have become such a widely talked about issue, because the incidence of the disease has DOUBLED in trees over the past several years. Shorter winters and the overall effects of climate change have brought this disease to the forefront. Control methods such as antibiotics have been outlawed in Organic Farming in the US (National Organic Standard Board) and some European countries and other controls such as copper have been moderately effective at best. Trials with products such as Companion<sup>®</sup> and "TKO" Phosphite offer a promising solution to this deadly disease that shows no sign of slowing down anytime soon.

#### **Apple Study** Dr. Christopher Becker - BAAR Scientific, LLC

With over 30 years experience, Dr. Becker is an expert in evaluating pest management products, with over 50% of the research experience conducted specifically in fungicides.



Fire blight (Erwinia amylovora)



Apple Scab (Venturia inaequalis)

June 18, 2017



# Fire Blight in Apples

Stand-alone treatment of Companion<sup>®</sup> at 64 oz. per acre and Companion<sup>®</sup> at 32 oz. per acre in combination with phosphite at 32 oz. per acre provided 34% and 51% control respectively over the untreated and twice the control over the antibiotic streptomycin\* treatment. Companion<sup>®</sup> plus "TKO" Phosphite. "What was great to see, is that the addition of Regulate<sup>™</sup>\*\* slightly reduced the severity of Apply Scab..... Plus the addition of "TKO" Phosphite significantly improved the management of Apple Scab."\*\*\*

# **Apple Scab**





\*The use of antibiotics is currently outlawed in several countries in the US. National Organic Standard Board (NOSB) eliminated the use of antibiotics streptomycin and tetracycline in organic apple and pear orchards to treat Fire blight. \*\*Regulate™ is a registered trademark of Prime Source

\*\*\*Dr. Christopher Becker, BAAR Scientific LLC. Romulus, New York