

Keeping up with Managing Fire Blight in 2013



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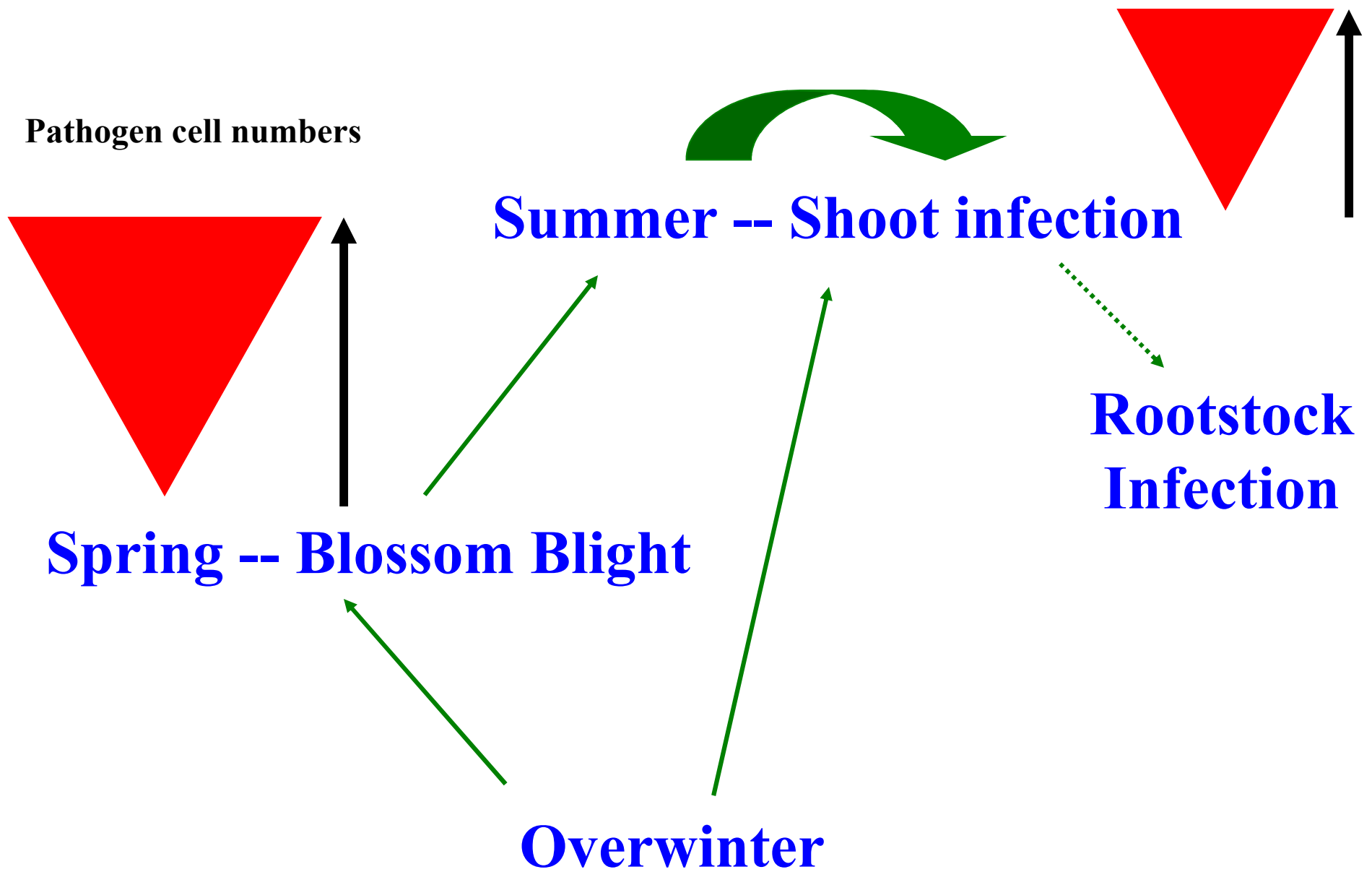
**MICHIGAN STATE
UNIVERSITY**

**Northwest Orchard and
Vineyard Show;
January 21, 2013**



Fire Blight pathogen -- starts small, grows extremely fast under conducive weather conditions





**Fire Blight is Complex, but also can be very simple;
However, that doesn't make it any easier to manage**



ca. 100,000 to 1,000,000 cells / flower

Erwinia Epiphytic Phase

- Population size of the pathogen is influenced by:
- Temperature
 - **Regulates generation time**
- Number of flowers in which the pathogen is established
 - **Increased by pollinating insects and rain**
- Thus, high temps during bloom and insect activity are risk factors that promote the **establishment and growth** of the pathogen on floral surfaces
- **RAIN** or heavy dew during or at the end of a warm period is a third risk factor



Fire Blight -- Flowers

Temperatures:

50's

60's

70's

80's

Rainfall



What slows growth on flowers?

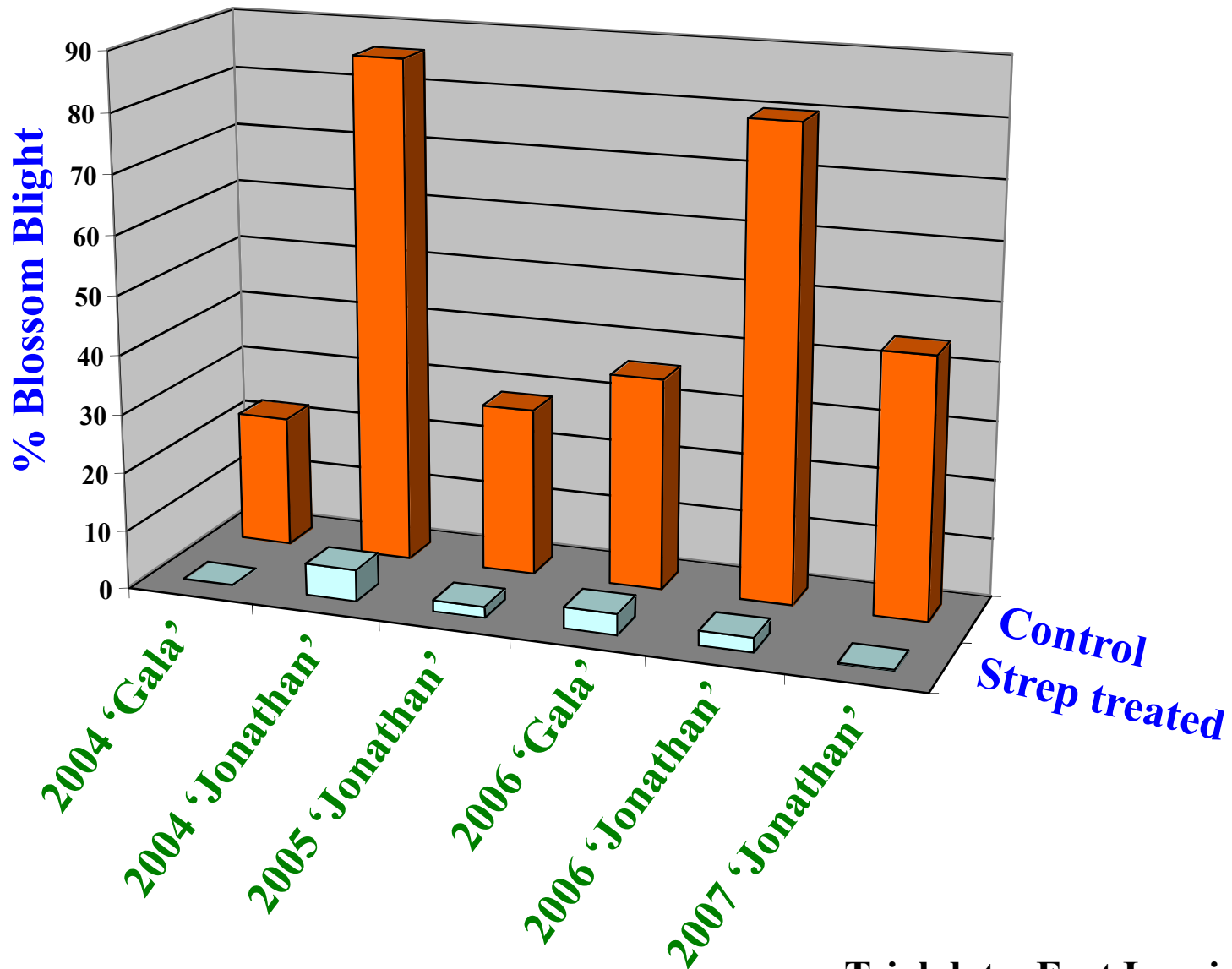
- #1. Weather
- #2. Antibiotics
- #3. Flower window of infection
- #4. Initial inoculum entry into trees



**Where do we need
to control
the fire blight pathogen?**



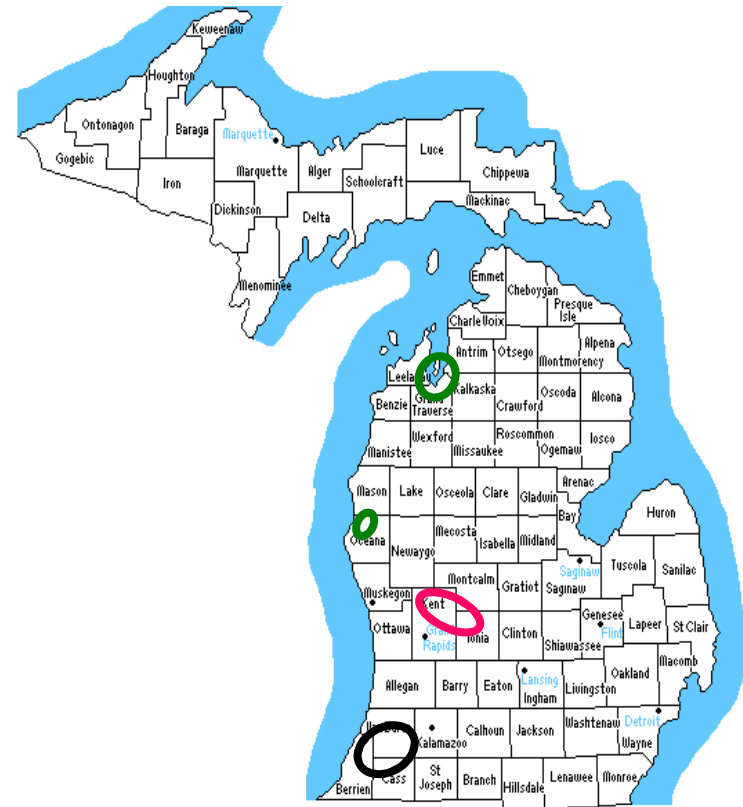
Management of Blossom Blight with Streptomycin



Trial data, East Lansing, MI

Streptomycin Resistance in *E. amylovora* in Michigan

- **Early-mid 1990's -- Southwest Michigan**
- **2004 -- Fruit Ridge area**
- **2005 -- Fruit Ridge area (further spread), Ionia cty.**
- **2006 -- Oceana county**
- **2010 -- Grand Traverse county**
- **2012 -- Antrim and Leelanau counties**



Materials Currently Available for Fire Blight Disease Management

- **Overwintering Inoculum**
 - Copper
- **Blossom Blight**
 - Streptomycin (Agrimycin and generics)
 - Oxytetracycline (Mycoshield, FireLine)
 - **Kasugamycin (Kasumin)** [Section 18 for Michigan]
 - Optiva
 - Bloomtime E325 – *Pantoea agglomerans*
 - Blossom Protect – *Aureobasidium pullulans*
- **Shoot Blight**
 - Prohexadione-Ca (Apogee)

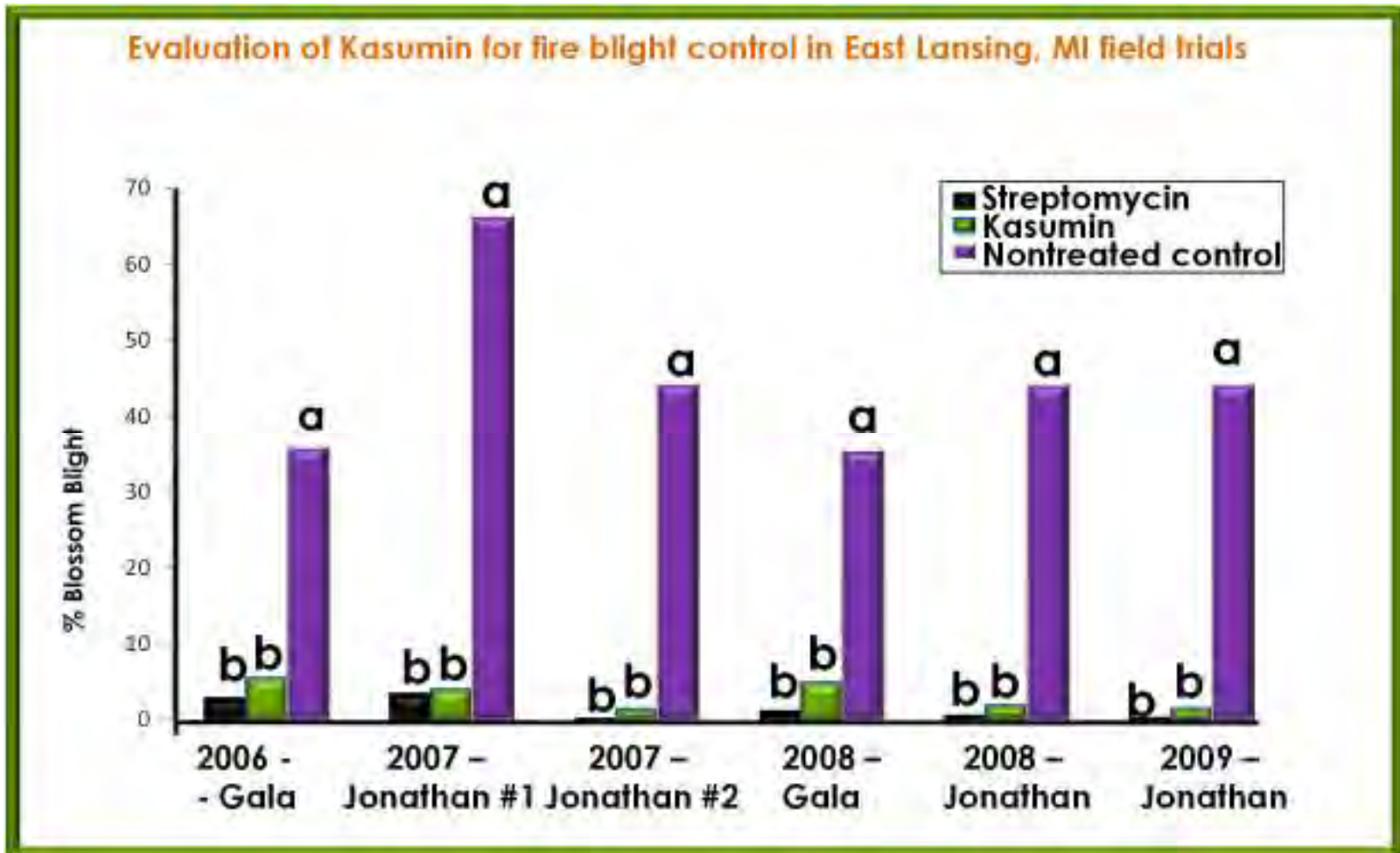
Streptomycin Alternatives -- Summary

- **Oxytetracycline**
- **Kasugamycin**
- **Biologicals**
 - **Optiva, Bloomtime Biological, Blossom Protect**
 - **Highly variable**
 - **Low to moderate pressure**
- **Integration of biologicals with antibiotics**
 - **Offers the most promise for efficacy and reduced number of antibiotic applications**

KASUMIN

- **Kasugamycin – aminoglycoside antibiotic in the same class as streptomycin**
- **Targets the bacterial ribosome – target site is different from that of streptomycin**
- **No cross resistance between streptomycin and kasugamycin**
- **No medical uses, no animal agriculture uses**

Trials by Year and Variety



Kasumin 2L

- **Section 18 was granted by EPA for 2010, 2011, and 2012; pending for 2013**
- **Kasumin is the alternative for streptomycin where we have resistance**
- **Section 3 registration is still pending; decision hopefully later in 2013**

Kasumin 2L

- **Section 18 counties for 2013:**
- **Berrien, Cass, Van Buren**
- **Kent, Ionia, Montcalm, Newaygo, Ottawa**
- **Oceana**
- **Antrim, Grand Traverse, Leelanau**

Kasumin Section 18

- **Conditions required prior to application:**
 - **MARYBLYT EIP of 100 or greater**
- **Do not apply Kasumin as the first spray of the season**
- **64 fl oz per acre**
- **Maximum 3 applications per season; 2 consecutive**
- **Do not apply after petal fall**

Shoot infection:

Vigorous growth

Microscopic injuries

Weather conditions to move inoculum

Variety important



**Shoot Blight Infection can Kill Young Trees
Planted on Susceptible Rootstocks**



Apogee (Prohexadione-Ca)

- **Reduces shoot growth**
- **Absorbed by apple foliage, transported acropetally to growing shoot tip**
- **Shoot-specific treatment**
- **Excellent control of shoot blight**
- **(Do not use on Empire or Winesap due to fruit cracking issues)**

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Summary

- **Kasumin Section 18 – best alternative to streptomycin**
- **Apogee for shoot blight control**
 - **Don't use on Empire or Winesap**
- **Mycoshield, FireLine – effective under low to moderate disease pressure**
- **Variability in biological controls**

New video resources from MSU Tree fruit pathology



www.youtube.com -- search for “tree fruit pathology”



**BIOLOGICAL CONTROL OF
FIRE BLIGHT**

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TREE FRUIT PATHOLOGY**



Thanks to:

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Project GREEN

Van Well Nursery