

# Fire Blight – Current Products, Research Grants and Regulatory Status

**David Granatstein**  
*WSU-CSANR, Wenatchee, WA*



Photo by F. Peryea

**Certis USA workshop**  
**Oct. 8, 2014**



# Outline

- **What's labeled for fire blight ?  
(WA, OR)**
- **Controls in the pipeline**
- **Regulatory status – EPA, NOP**
- **Grants – current, recent**
- **Grower survey feedback –  
WA, MI**



Yakima Valley

# What's Labeled for FB?

## Coppers

Active Ingredient	Product	Org?
Cu (metallic)/Cuprous oxide	AgCopp 75	N
Cu Ammonia Complex	Copper-Count-N	N
Cu hydroxide	Badge, Kocide, CuPro2005...	N
	Badge X2, Champ, NuCop	Y
Cu metallic	L/M Kop-R-Spray	N
Cu octanoate	SoapShield, Ortho Disease-B-Gone	N
	Cueva, Bonide Liquid Copper	Y
Cu oxide	ChemCopp50	N
	Nordox	Y
Cu oxychloride	Badge, C-O-C-S	N
	Badge X2	Y
Cu sulfate (pentahydrate)	Aquavet, CS2005, Delcup, Mastercop	N
Cu sulfate basic	Phyton, , C-O-C-S, CuproFix	N
	Agristar Basic Copper 53	Y

# What's Labeled for FB?

## Other Chemicals

Active Ingredient	Product	Org?
Azoxystrobin	Azaka	N
Boscalid	Pristine	N
Fosetyl Al	Aliette, Flanker, Viceroy	N
IBA	Quanta	N
Mancozeb	Dithane, ManKocide	N
Monopotassium phosphate	Nutrol 0-50-32, Phorcephite	N
N-Alkyl	Consan Triple action	N
Phosphorus acid, mono- and di-K salts	AgriPhos, Alude, Confine Extra, Fosphite, KPhite, LeafGuard, Organic Plant Dr., Oxiphos, phiticide, Phorcephite, Phostrol, Quanta, Rampart, Reliant, Resist	N

# What's Labeled for FB?

## Other Chemicals

Active Ingredient	Product	Org?
Ca Oxytetracycline	Mycoject	N
	Mycoshield	Y*
Oxytet hydrochloride	Arbor OTC, Mycoject	N
	FireLine	Y*
Streptomycin sulfate	Ag Streptomycin, AS-50, Harbor	N Y*
	AgriMycin, FireWall	
Hydrogen peroxide	OxiPhos	N
	OxiDate	Y
Peroxyacetic acid	OxiDate	Y
Sulfur		Y

\*until Oct. 21, 2014

# What's Labeled for FB?

## Natural Materials

Active ingredient	Product	Org ?
<i>Reynoutria sachalinnensis</i> extract	Regalia	Y
Clove oil	Sporatec	Y
Rosemary oil	Sporatec	Y
Thyme oil	Sporatec	Y
Laminarin	Vacciplant	EU
Acidified clay	Myco-Sin	EU

# What's Labeled for FB?

## Biologicals

Active Ingredient	Product	Org?
<i>Aureobasidium pullulans</i> (DSM 14941, 14942)	Blossom Protect	Y
<i>B. pumilus</i> (QST2808)	Sonata	Y
<i>B. subtilis</i> (QST713)	Serenade, Optiva, Bayer Advanced Natria	Y
<i>B. subtilis</i> var. <i>amyloliquefaciens</i> (D747)	Double Nickel	Y
<i>Pantoea agglomerans</i> (E325)	Bloomtime Biological	Y
<i>Pseudomonas fluorescens</i> (A506)	BlightBan A506	Y

# In the Pipeline

Active ingredient	Product	Status	Company
<b>Copper hydroxide/ ammonium acetate</b>	Previsto	<ul style="list-style-type: none"> <li>• OMRI 4/2014</li> <li>• EPA “concern with ammonium acetate”; go/no go from EPA by mid-Oct.?</li> </ul>	Gowan
<b>Kasugamycin</b>	Kasumin	<ul style="list-style-type: none"> <li>• EPA label just granted?</li> </ul>	Arysta
<b>Bacteriophage</b>	Fire Quencher	<ul style="list-style-type: none"> <li>• First field tests 2014</li> <li>• Working with IR-4 on EPA approval</li> </ul>	BYU
<b>Dictyostelids</b>	Dicty?? targets living bacteria and biofilms	<ul style="list-style-type: none"> <li>• SBIR Phase 1 completed; now Phase 2 application</li> <li>• target release 2017</li> </ul>	AmebaGone



## EPA Review Process

- Registration review process created by FQPA, started 2007; Office of Pesticide Programs; 6+ yr process
- Requires EPA to review each pesticide's registration at least every 15 years
- Registration review builds upon previous assessments and decisions:
  - What has changed since the last assessment?
  - How significant is this change?
  - Do we need new information and/or studies?
  - Is the regulatory position likely to change as a result of new information?
- Decisions will address any changes to the risk picture
- EPA will propose risk mitigation to address risk and work with registrants and stakeholders on any label changes needed

## Antibiotic Status - EPA

- EPA review of strep and oxytet underway since 2008
- Several data call-ins completed
- Recent EPA actions:
  - approved “A” priorities for strep for grapefruit and tomatoes, for oxytet residue studies for cherries
  - Section 18 emergency exemption for FireWall to control citrus canker in Florida grapefruit the past two years;
- USDA considering antibiotics as part of response to citrus greening
- Strep – interim decision mid-2016 earliest
- OTC – no estimated date; need to bridge studies of different formulations
- “does not foresee a problem with continued registration”

# Antibiotic Status - NOP

## NOSB decisions

4/11/13. Motion to extend expiration date of oxytet to 2016 failed. (Federal Register 8.2.2012 p. 45903)

5/2/14. Motion to extend expiration date of strep to 2016 failed.

Result: use of both materials ends on Oct. 21, 2014.

## Final Rule Change

eCFR as of 9.10.14.

205.601(i)

(11) Streptomycin, for fire blight control in apples and pears only until October 21, 2014.

(12) Tetracycline, for fire blight control in apples and pears only until October 21, 2014.

## Effect of NOSB Media on Organic Apple Sales

**Did negative media on antibiotics and organic tree fruit impact sales?**

- NOSB meeting, Apr. 10, 2013
- Sales for week ending Apr. 28
- ‘Gala’ and ‘Pink Lady’ were targeted by consumer group negative media
- No discernable effect

No. of 40-lb boxes of organic apples shipped from WA,  
last week of April

	Apr 2013	Apr 2012	Apr 2011
Total WA	196,000	121,000	157,000
Pink Lady	18,000	6,000	19,000
Gala	49,000	34,000	41,000
Fuji	74,000	43,000	39,000
Red Del.	22,000	18,000	22,000

(Data: WVTA)

# Research Grants

## USDA organic (~\$120K/yr)

- K. Johnson. *Implementation of non-antibiotic programs for fire blight control in organic apple and pear in the western US.* OR, WA, CA. Sept 2014-Aug 2017. \$496K (ORG)
- K. Johnson. *Development of non-antibiotic programs for fire blight control in organic apple and pear.* OR, WA, CA. Sept 2011-Aug 2015. \$476K (OREI)
- G. Sundin. *Organic management of fire blight in a post-antibiotic era: developing, evaluating, and delivering options for apples grown in humid climates.* MI. Sept. 2013-Aug. 2016. \$464K (OREI).

# Research Grants

## USDA SCRI

- S. Korban. *Integrated genomics and management systems for control of fire blight*. IL. Sept. 2009-Aug. 2014. \$1.95 million
- M. Grieshop. *Development and delivery of resource-efficient, ecologically sustainable fruit production systems for apple and cherry producers*. MI, WA, NY. Sept. 2011-Aug. 2014. \$2.47 million
- RosBREED2 (proposed). J. Norelli et al., breeding resistance in apple using *M. floribunda* and other sources

# Research Grants

## USDA SBIR

- M. Filutowicz, Univ. Wisconsin, and AmebaGone. *Amoeba for control of fire blight*. SBIR project Phase 1 completed. Phase 2 application in process

## CA Pear Advisory Board (~\$25-30K/yr)

- J. Adaskaveg, D. Gubler. *Evaluation of new bactericides for control of fire blight of pears caused by Erwinia amylovora*.
- R. Elkins, S. Lindow. *Control of fire blight disease in pear caused by Erwinia amylovora using biological control agents, copper, and antibiotics*.
- R. Elkins et al. *Evaluation of delayed-dormant copper as a component of a fire blight IPM program*.

# Research Grants

## WA Tree Fruit Research Commission

10 fire blight projects in past 10 years (~\$50K/yr)

- K. Johnson. *Fire blight epidemiology and improved post infection control*. OR. SAR, delayed dormant copper, LAMP.
- K. Johnson. *Evaluation of integrated fire blight control technologies*. OR.
- T. Smith. *Improving the management of two critical pome fruit diseases*. WA.
- J. Norelli. *Identifying fire blight resistance in *M. sieversii* for scion breeding*. WV, WA.



# Grower Feedback

From organic tree fruit grower meetings in WA

How would the loss of antibiotics for fire blight control impact your operation?

	Jan 2011	Jan 2012	Jan 2014
<b>Little or no effect</b>	22%	7%	32%
<b>Reduce acres of organic pears</b>	16%	4%	6%
<b>Reduce acres of susceptible apple varieties</b>	41%	44%	53%
<b>Exit organic apple and/or pear production</b>	22%	44%	9%

# Grower Feedback

From organic tree fruit grower meetings in WA

Have you tried a non-antibiotic control regime?

	Jan 2012	Jan 2014
Yes	73%	67%
No	27%	33%

If so, was it successful?

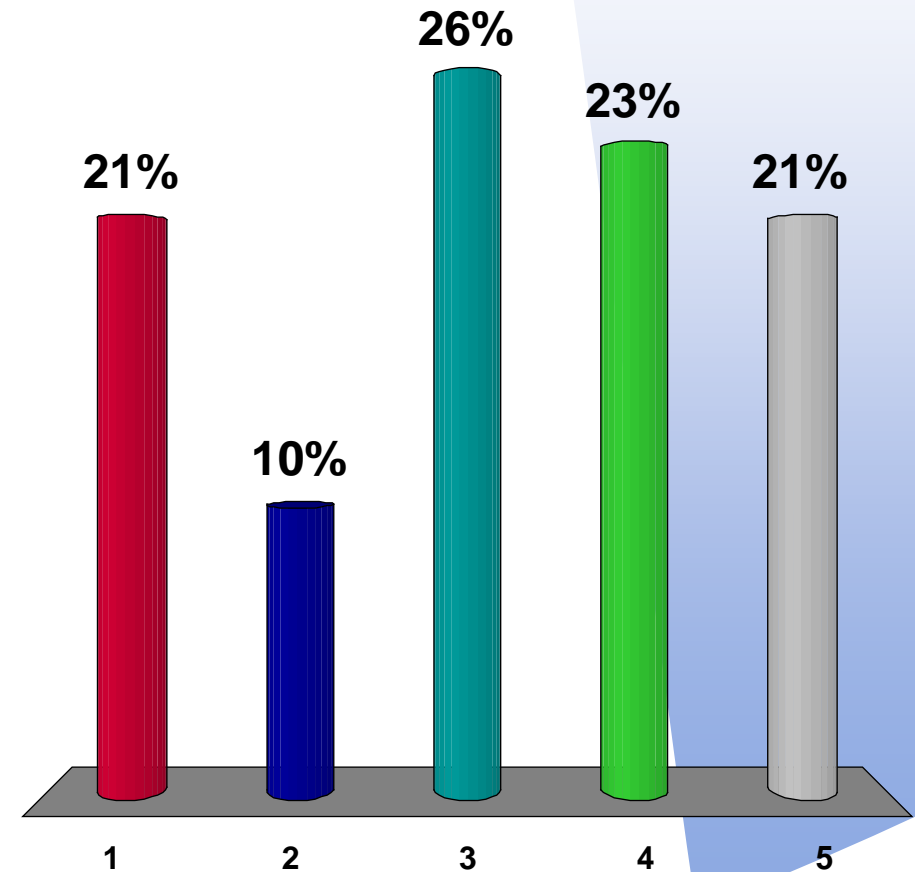
	Jan 2012	Jan 2014
Yes	33%	74%
No	67%	26%

# Grower Feedback

From organic tree fruit grower meetings in WA

If you have tried non-antibiotic fire blight control, was the focus on an 'integrated' control program with multiple materials and timings?

1. Have not tried
2. One material only
3. Yes, 2 materials
4. Yes, 3 materials
5. Yes, more than 3 materials.

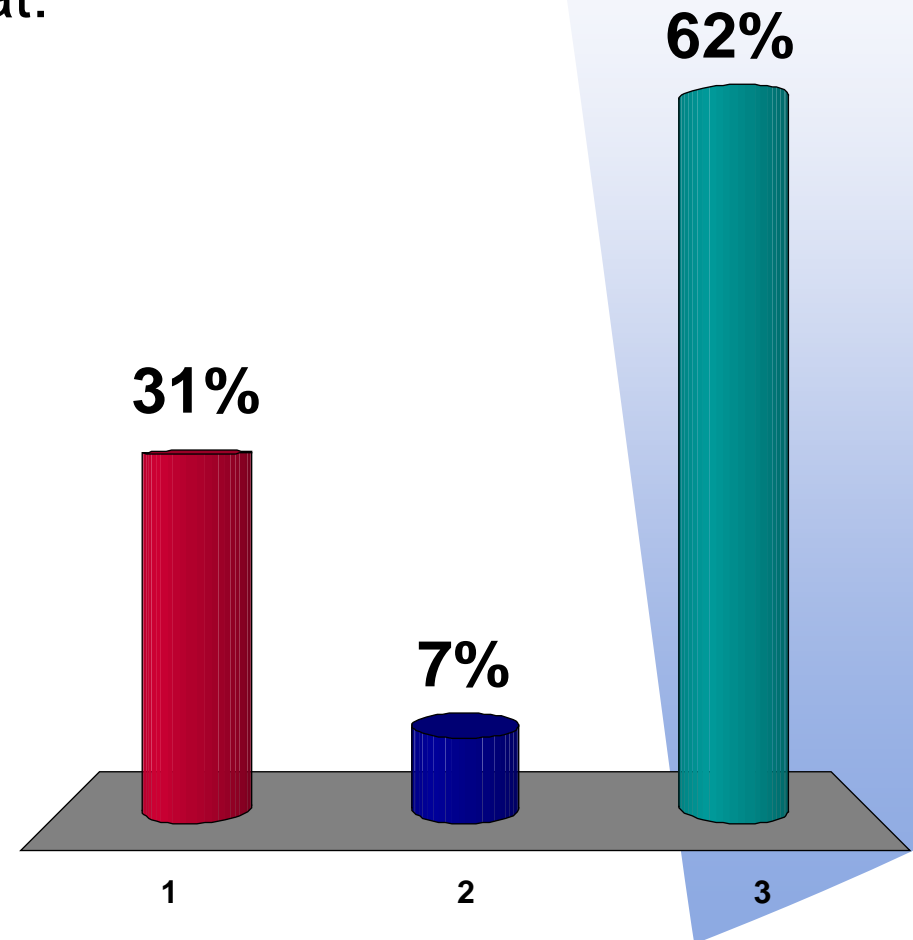


# Grower Feedback

From organic tree fruit grower meetings in WA

Is your primary fire blight threat:

1. Blossom blight
2. Shoot blight
3. Both



Jan. 2014

# Grower Feedback

From organic tree fruit grower meetings in WA

How do you see your organic tree fruit production changing over the next five years?

	Jan 2011	Jan 2014
<b>Expand acres under organic management</b>	21%	45%
<b>Decrease acres under organic management</b>	26%	11%
<b>Stay about the same</b>	44%	39%
<b>Exit organic production</b>	8%	0%
<b>Exit all fruit production</b>	3%	2%
<b>Don't know</b>	0%	2%

# Grower Feedback

From 2013 GLEXPO, MI

Proportion of apple orchard under active fire blight management:

	<u>% responses</u>
Zero	29
Up to 75%	12
100%	59

Ave. number of bloom sprays in a year?

None	19
1-2	44
3+	38

# Grower Feedback

From 2013 GLEXPO, MI

How likely to use next year? (% responses)

	<u>AB</u>	<u>Serenade</u>	<u>Cu</u>	<u>BP</u>
Definitely/already use	31	27	44	0
Very likely	25	7	19	18
Somewhat likely	19	13	19	6
Not likely	25	40	19	53
Will not use	0	13	0	24

Continue organic production after loss of antibiotics?

Absolutely	50
Very likely	25
Somewhat likely	8
Not likely	0
Absolutely won't	17

*(M. Grieshop)*

# Outreach

Grower meeting presentations 2012-14 – K. Johnson,  
T. Smith, H. Ostenson

K. Johnson presentation (ISHS) June 2012; 4,100 views.

K. Johnson. Research Update on Non-Antibiotic Control of Fire  
Blight Webinar. eOrganic, March 2013.

[http://www.extension.org/pages/67392/research-update-on-non-antibiotic-control-of-fire-blight-webinar#.VA\\_Lc6M2ezo](http://www.extension.org/pages/67392/research-update-on-non-antibiotic-control-of-fire-blight-webinar#.VA_Lc6M2ezo)

Smith, Johnson. ISHS Fire  
Blight workshop, 2013.

Johnson, Smith, Elkins.  
Commission project reports.



*Photo: J. Brunner*



# Outreach

Ostenson, H. and Granatstein, D. *Grower Lessons and Emerging Research for Developing an Integrated Non-Antibiotic Fire Blight Control Program in Organic Fruit*. Nov 2013. The Organic Center. [http://organic-center.org/wp-content/uploads/2013/07/TOC\\_Report\\_Blight\\_2b.pdf](http://organic-center.org/wp-content/uploads/2013/07/TOC_Report_Blight_2b.pdf)

Granatstein, D. *Fire Blight Control for Organic Orchards: Moving Beyond Antibiotics*. May 2014. eOrganic. [https://www.extension.org/pages/70541/fire-blight-control-for-organic-orchards:-moving-beyond-antibiotics#.VA\\_KOqM2ezo](https://www.extension.org/pages/70541/fire-blight-control-for-organic-orchards:-moving-beyond-antibiotics#.VA_KOqM2ezo)

Organic fire blight web page. <http://www.tfrec.wsu.edu/pages/organic/fireblight>



Photo: J. Brunner