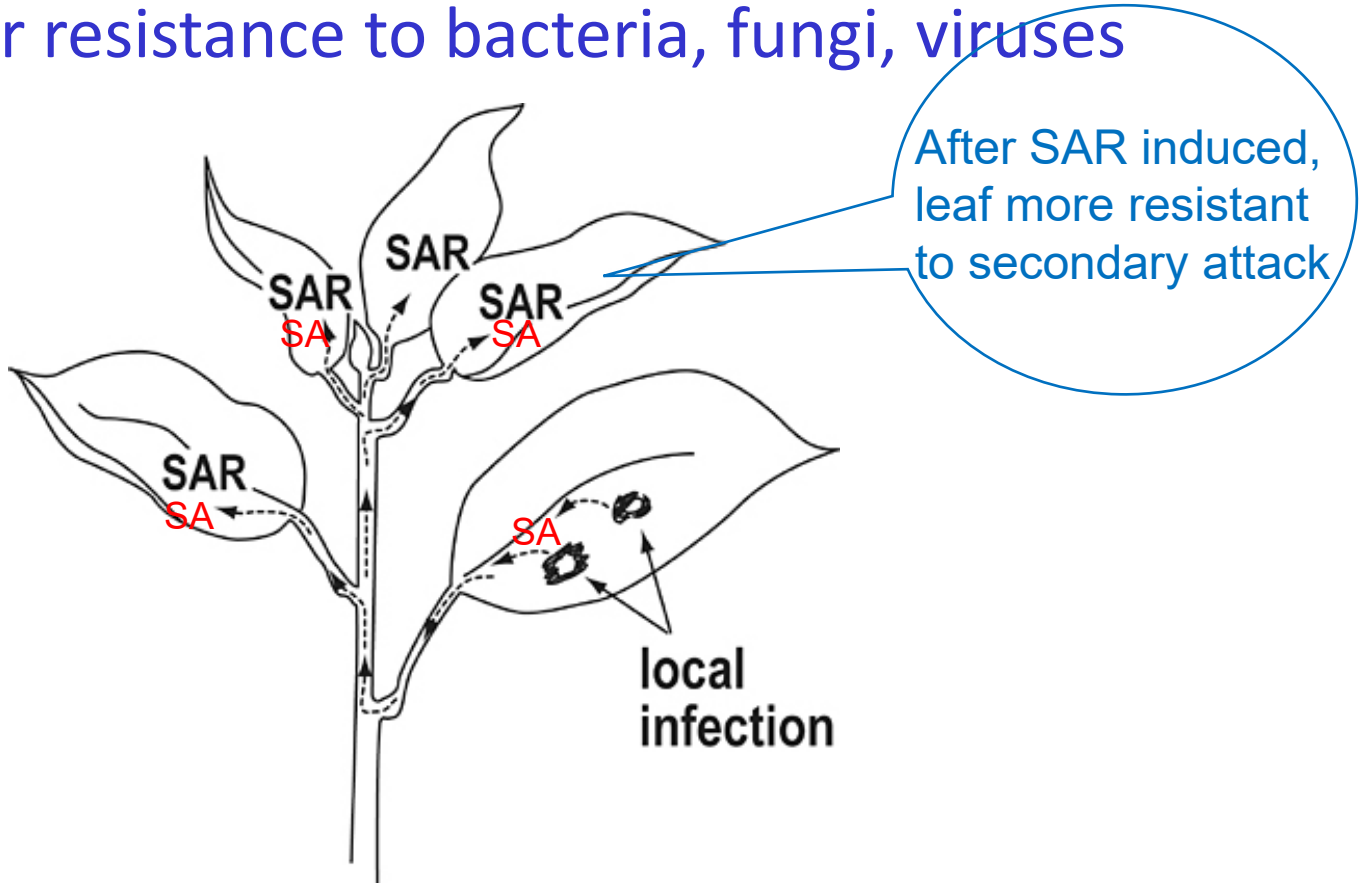
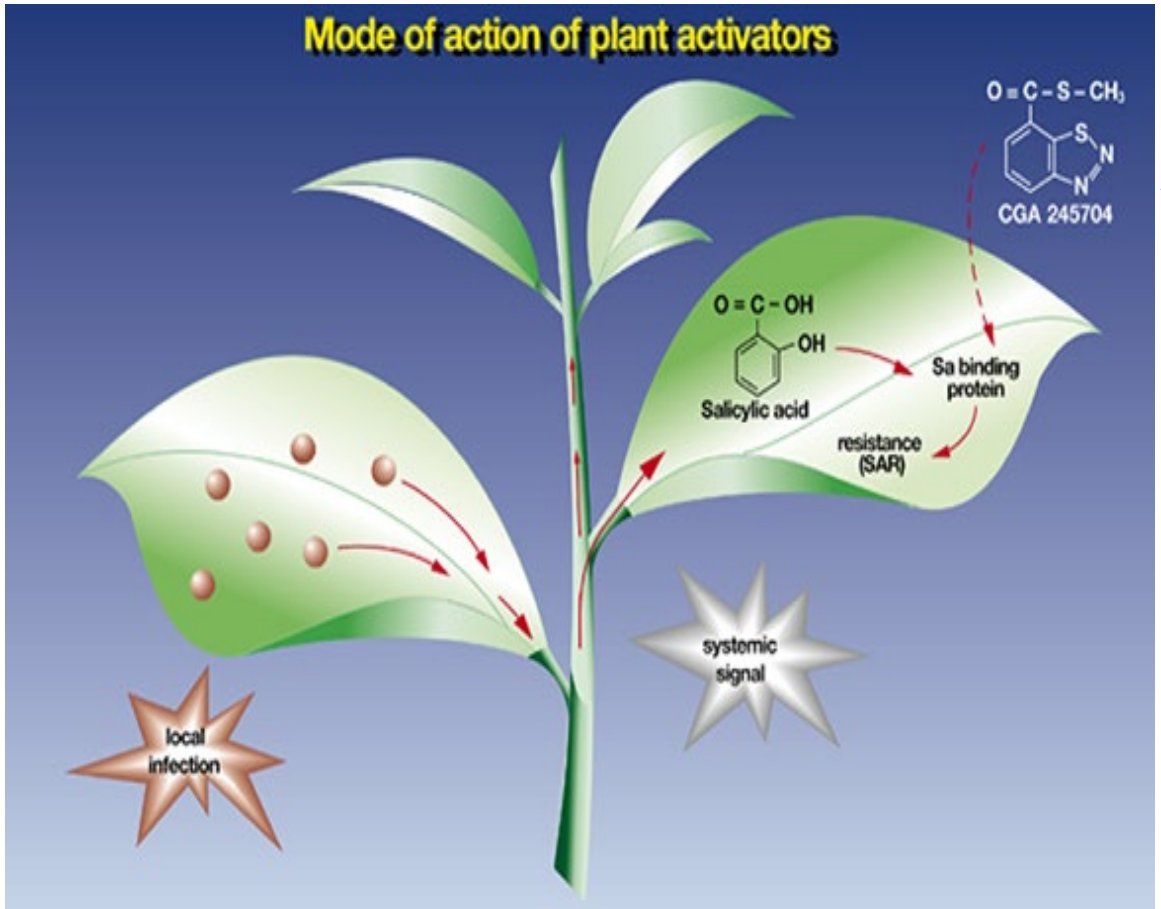
Actigard

What is Systemic Acquired Resistance?

- Pathogen attack stimulates whole plant signaling
- The signal, salicylic acid, accumulates and induces defense
- Results in greater resistance to bacteria, fungi, viruses



How do we use SAR for fire blight?



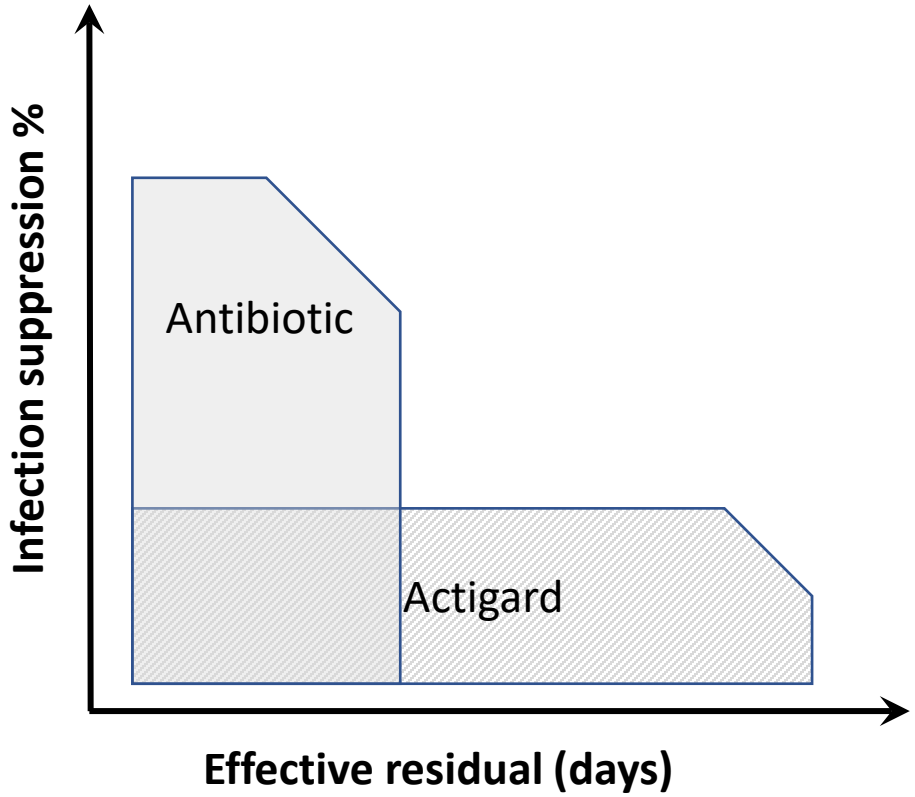
Actigard mimics salicyclic acid

Sprays and paints of Actigard turn of defenses in trees

Result in less fire blight !

Spraying Actigard

Actigard protection in mixture with antibiotics



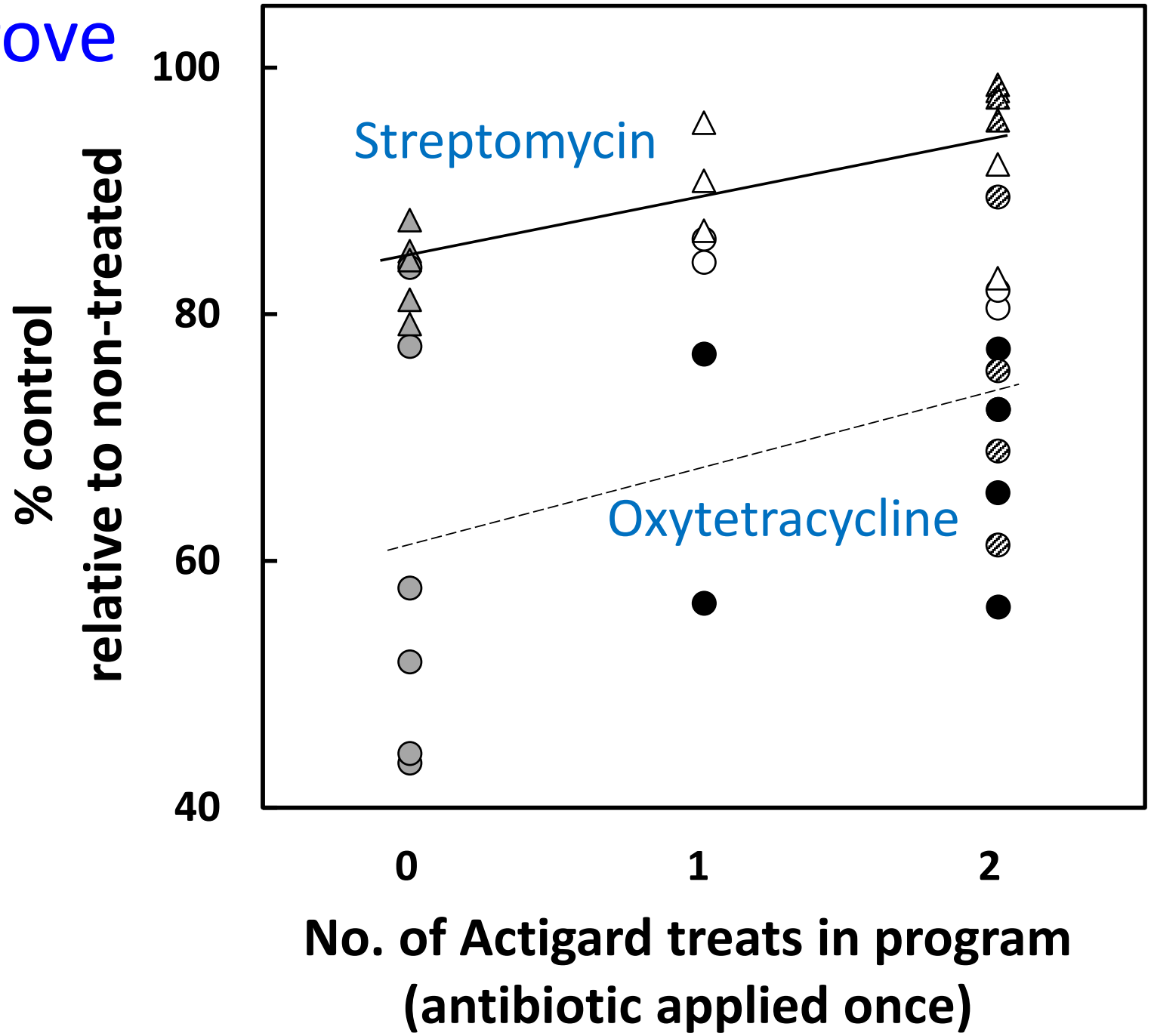
Actigard sprays improve antibiotic control

Inoculated fire blight trials
Wenatchee (Smith)
Corvallis (Johnson)

2011 to 2014

Effect of one antibiotic spray in combo with 0, 1 or 2 sprays of Actigard

(2 oz/100 gal)



Cutting Blight

How to take care of fire blight once it is present

- Cutting blight

  - Cells of pathogen diffuse through healthy-appearing wood well ahead of expanding canker

  - The younger the tree, the deeper the cut: 2- to 4-feet below canker in very young trees.

    12- to 18-inches in older trees (with ugly stub).

  - Repeat tree inspections frequently.

  - Consider Actigard therapy in conjunction with cutting

- Tree replacement

  - Rootstock blight: (M.9, EMLA 26)

    -- occurs in spring of next season, but in fall, tree canopy can appear 'reddish' before leaf drop

  - 1st- and 2nd-leaf trees with fire blight: the rule is pull and replace

  - High density orchards: Fire blight can move root-to-root (M.9, EMLA 26)

- Cultural factors that contribute to orchard recovery

  - Slow growth by reducing water and nutrition

  - Summer copper programs in young orchards with blight

Actigard therapy in association with cutting blight

- Expensive!
- But, may be appropriate for 3 to 7 year-old trees in susceptible cultivars where tree loss is even more expensive!!

Actigard Section 3 label (November 2015)

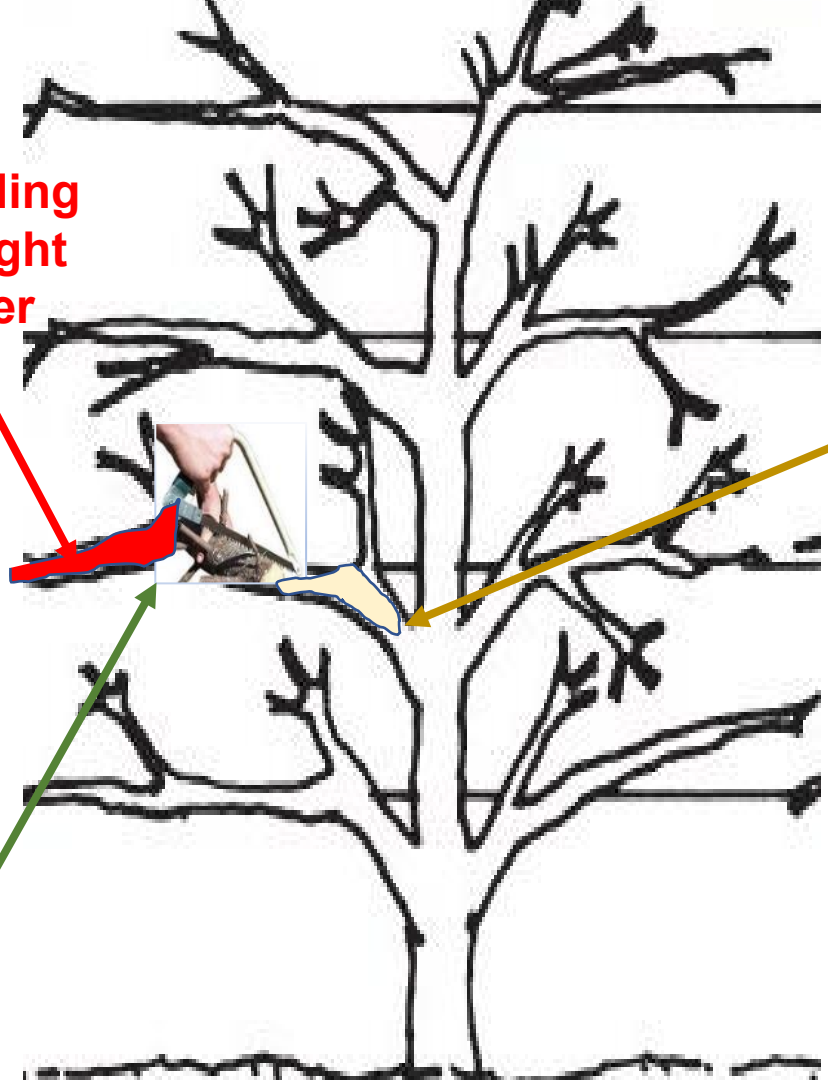
Crop	Pest	Rate per Application	Remarks
Apples **Pears**	Suppression of: Fire Blight *(Erwinia amylovra)*	Per Acre 0.5 - 3.2 oz/A	**Foliar Application:** Apply in a tank mix with a fire blight treatment (generally an antibiotic) that is standard in your area. This is generally 2-3 applications between 20% bloom and petal fall depending on the environmental conditions. Do not apply closer than a 7 day interval.
		1 oz/1 quart of 1% penetrant	**Paint application after canker cut-outs or grafts:** Mix 1 oz Actigard in 1 quart of 1% Pentrabark or similar penetrant. Apply to the branch area immediately below canker after cutting to an area extending 1 – 1 1/2 feet. One quart will treat approximately 500 cuts. Do not apply within 60 days of harvest.
Pome Crop Group 11-10: Apple; azarole; crabapple; loquat; mayhaw; medlar; pear; pear, Asian; quince; quince, Chinese; quince, Japanese; tejocote; cultivars, varieties, and/or hybrids of these.			
Specific Use Restrictions: (1) Do not apply more than 3.2 oz (0.1 lb ai) Actigard 50WG per acre per application. (2) Do not apply more than 12.8 oz (0.4 lb ai) of Actigard 50WG per acre per season. (4) Do not apply within 60 days of harvest (60-day PHI).			

To aid restoration of health after fire blight infection in 3- to 7-year-old apple and pear trees

Cells of pathogen diffuse through healthy-appearing wood ahead of expanding canker

After initial pruning cut, fire blight frequently ‘re-ignites’ at the cut site or at the graft union (M.9 rootstock) owing to residual cells of the pathogen in tree after the canker has been removed

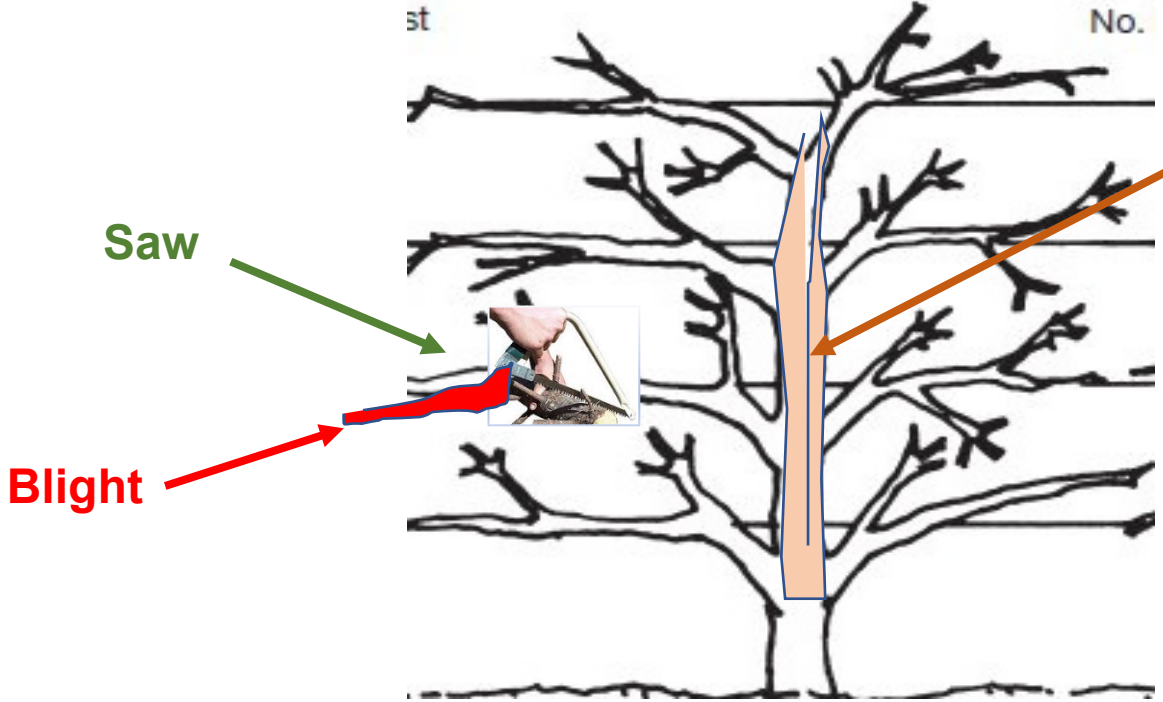
‘Early and fast’ pruning results in less time for cell diffusion process

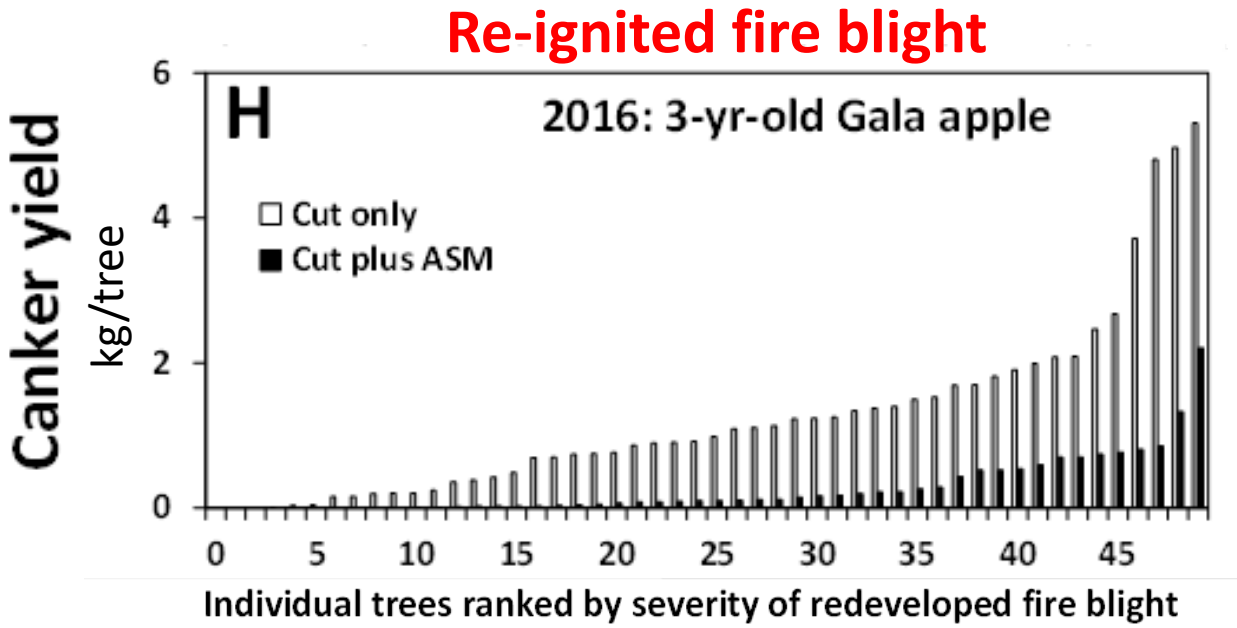


Sometimes, especially in young trees, these lingering pathogen cells start the disease up again.

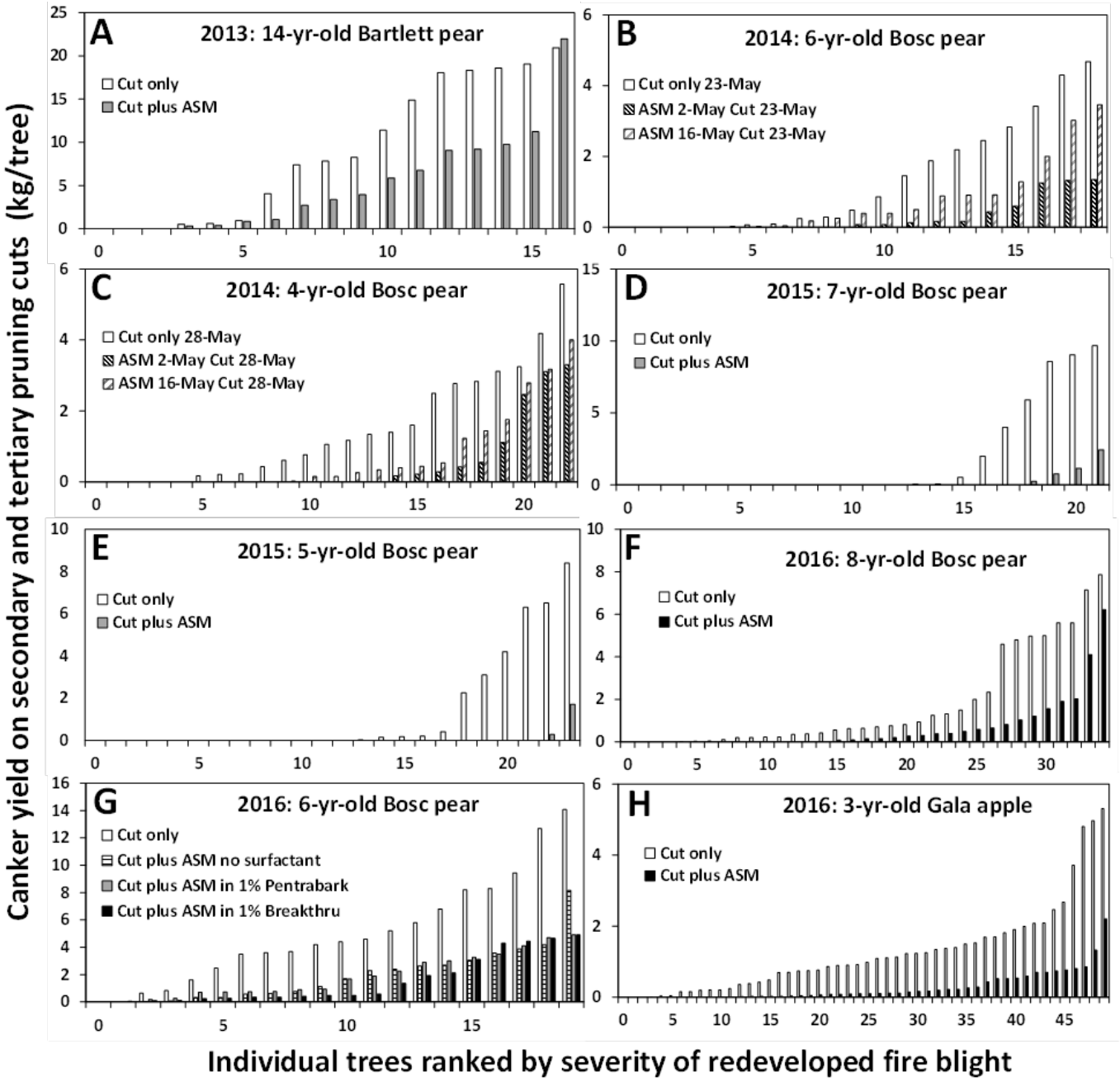
AFTER PRUNING,

paint Actigard onto central leader to prevent re-ignition and slow canker expansion <u>after re-ignition</u>





SAR therapy has been beneficial when we've tried it



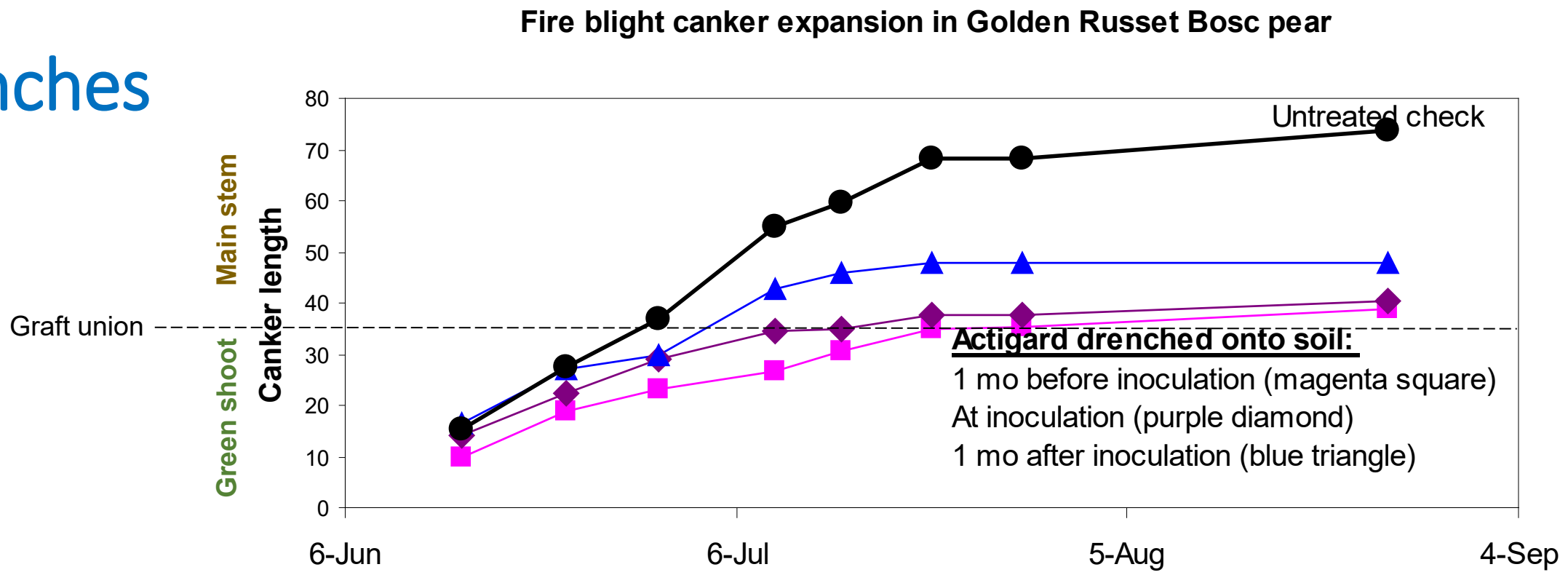
So, question to audience:
when doesn't it work?

- Apple or pear?
- Cultivar?
- Nutrition interactions?
- Tree age?

Other things we have done with Actigard therapy, which are interesting but impractical

- Soil drenches of Actigard to slow disease advancement
- Drenches and concentrated Actigard to protect rootstocks
- Concentrated Actigard protection of tree replacements
- Concentrated Actigard to protect trees from floral infection

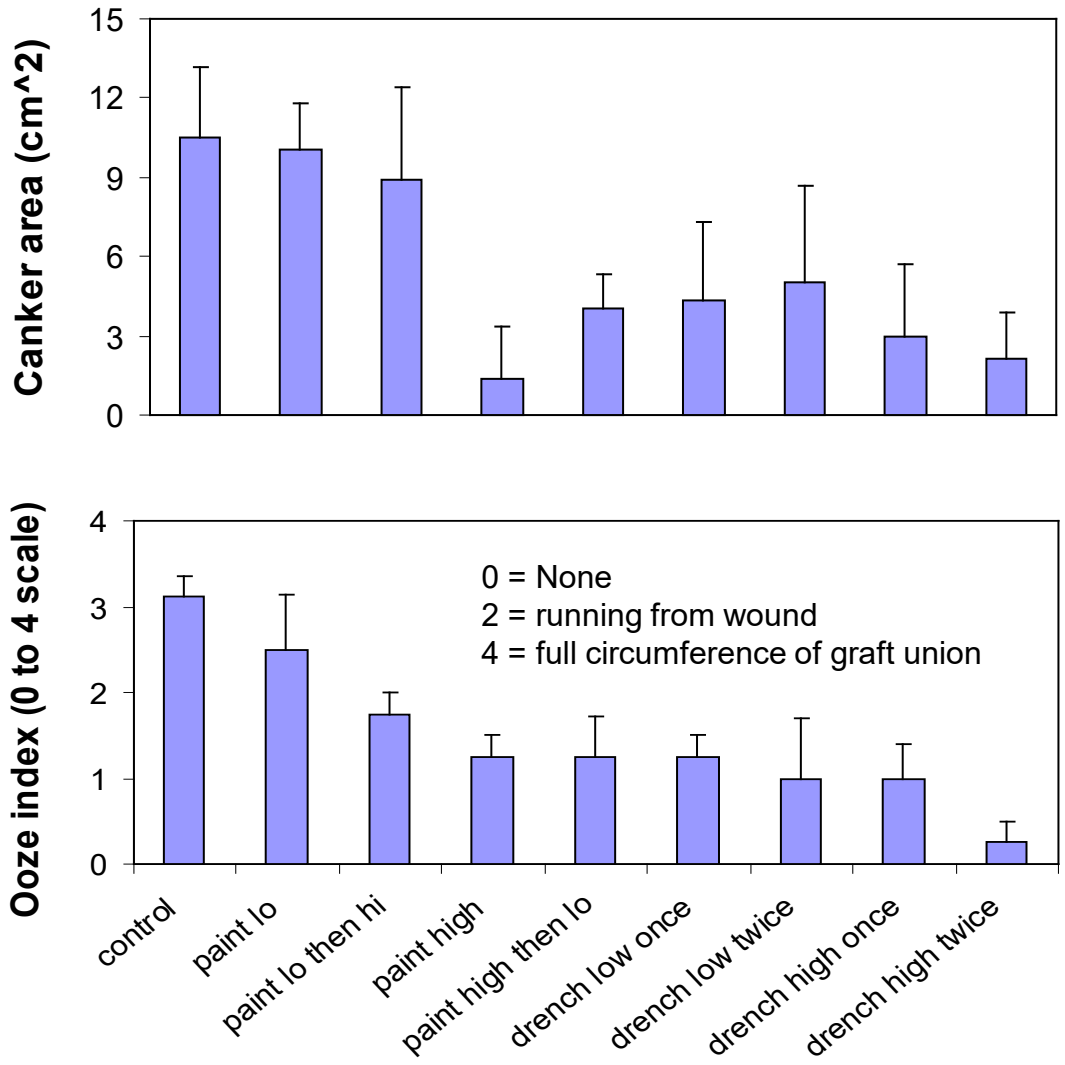
Drenches



Inoculated control

Actigard drenched on soil 1 mo before inoculation

Drenches and paints to protect rootstocks -- EMLA 26 (Gala)



Concentrated Actigard to protect rootstocks

2012 rootstock blight trial: M26 / Gala

Treat twice: early June

late June

Inoculate July

Observe late Sept 2012

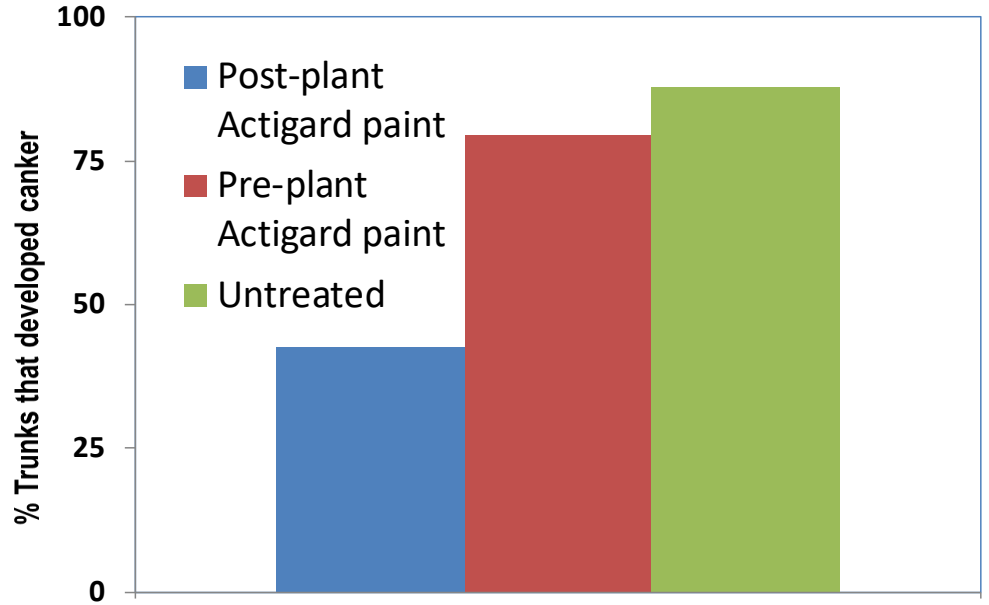
← **Untreated checks**

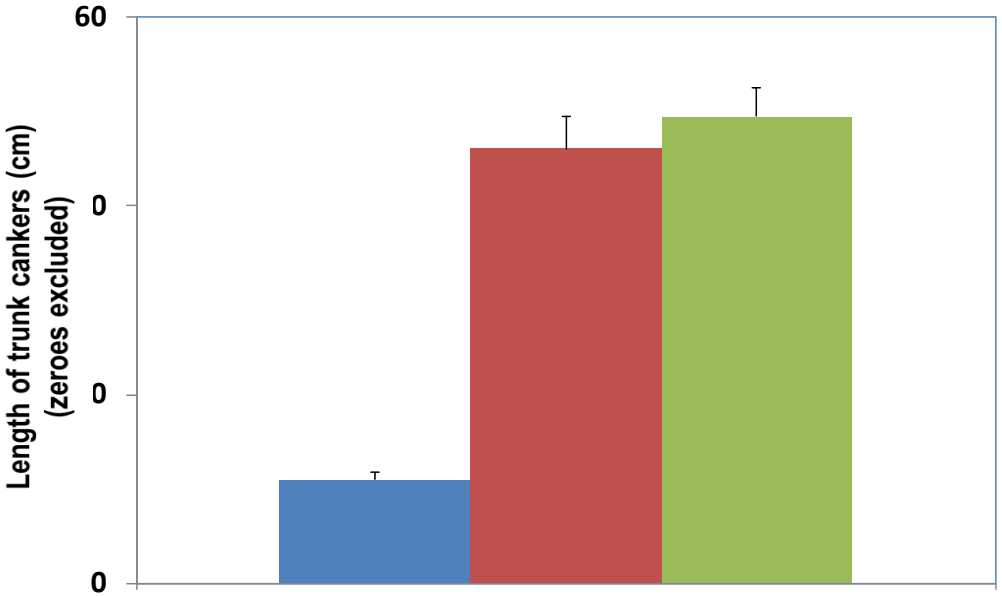
Actigard painted twice on rootstock before inoculation ←

Concentrated Actigard on replacement trees

- Plant late April
- Inoculate early June
- Pre-Plant Actigard (therapy rate)
- Post-Inoculation Actigard (early June)

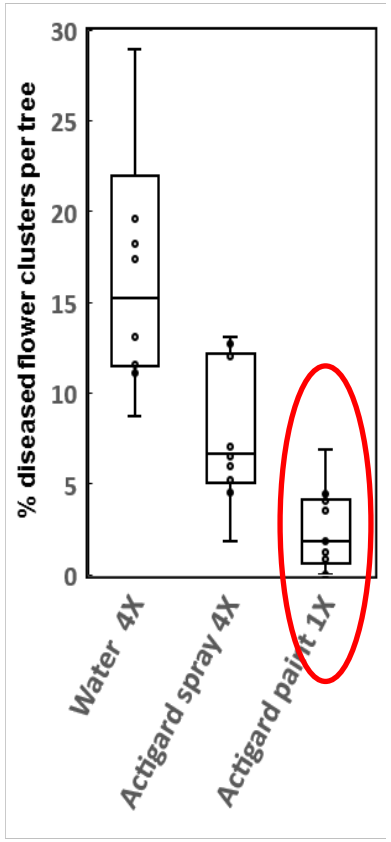
Conclusion: tree has to be actively growing to respond to Actigard treatment



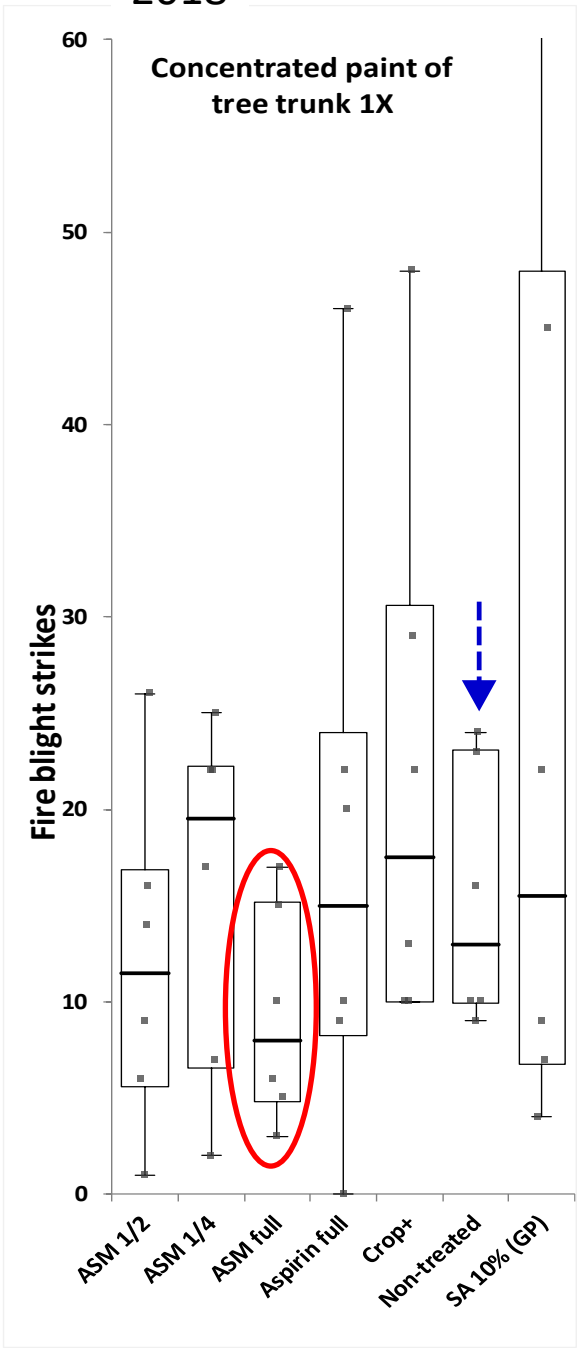


Concentrated paints to protect trees from floral infection

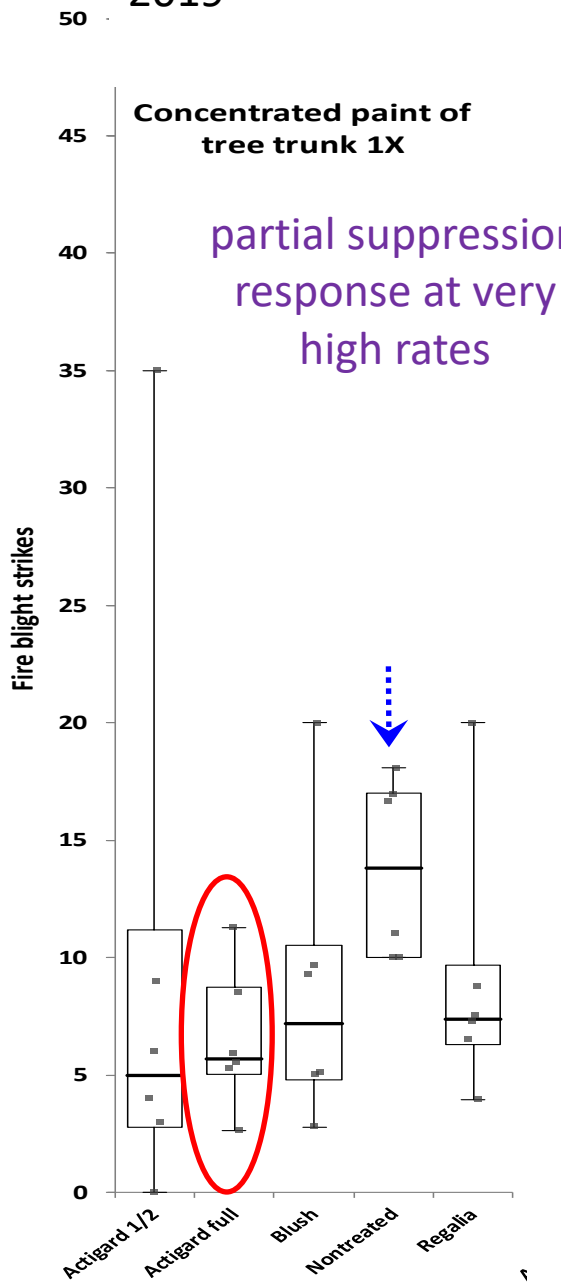
2017



2018



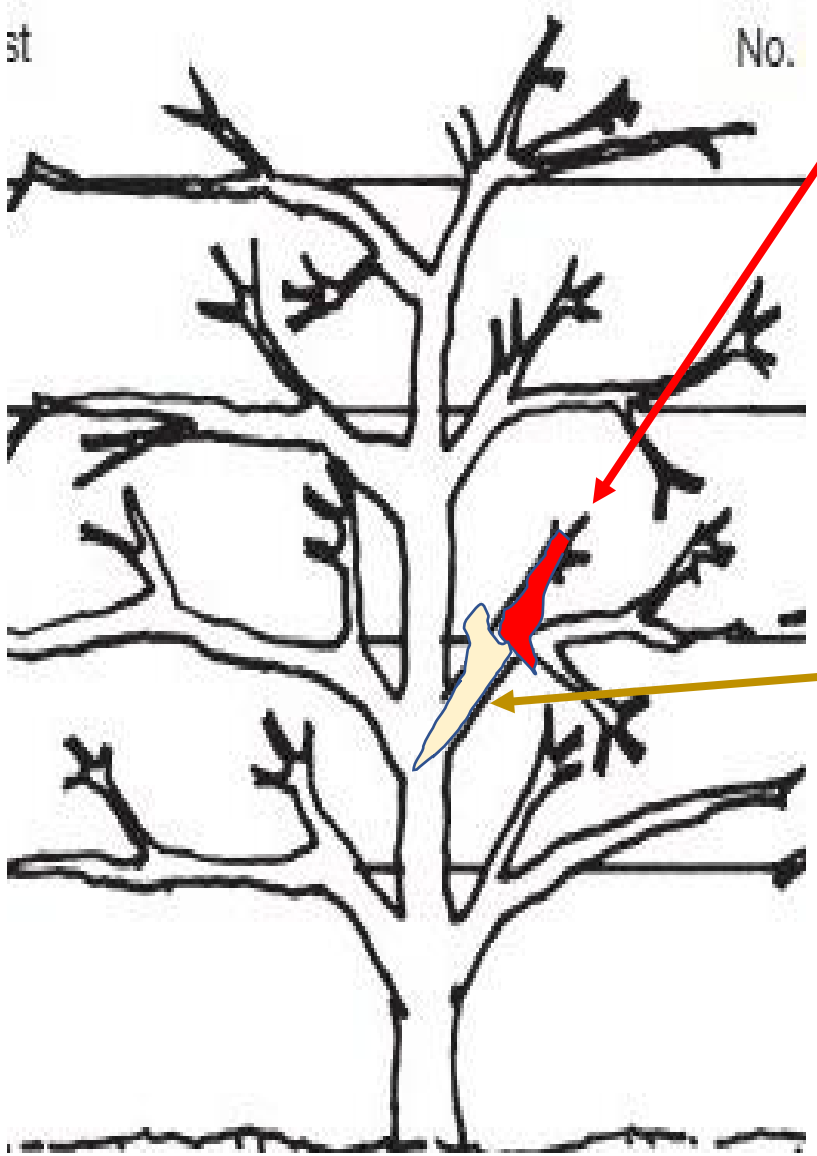
2019



partial suppression response at very high rates

So, when is the best time to utilize Actigard therapy in conjunction in with cutting?

- 3- to 7 year old trees
- Vigor of tree is high, and difficult to modulate.
- Infection removal ensures residual cells are still in tree, especially near central leader



Expanding fire blight canker

Pathogen cells that have diffused ahead of the expanding canker, down the branch and into the central leader. At the time of the cut, the branch and leader are symptomless and appear healthy

Sometimes, especially in young trees, these lingering pathogen cells start the disease up again.

Actigard therapy in association with cutting blight

Questions?

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-- Expensive!

-- But, may be appropriate for 3 to 7 year-old trees in susceptible cultivars where tree loss is even more expensive!!

extension more mind reach
OSU Oregon State University
Washington State University World Class. Face to Face.
Washington Tree Fruit Research Commission
USA
California Pears
USDA NIFA