Updates on Products for Managing Diseases of Apples

Kerik D. Cox

NYSAES

Plant Pathology and Plant-Microbe Biology Section
School of Integrative Plant Science
Cornell University

Outline

- **Efficacy of new fungicides for apple scab powdery mildew management**
- Efficacy of fungicides for post-harvest bitter rot management
- Prohexadione Ca, Biologicals, & SARs for fire blight management

Apple scab & powdery mildew concerns for 2017

- Secondary apple scab pressure heavy June to August rains: 13 infections & 11” inches
- SDHI fungicides – remain effective
- Heavy rains and cooler weather kept mildew pressure low

Apple scab & powdery mildew trials

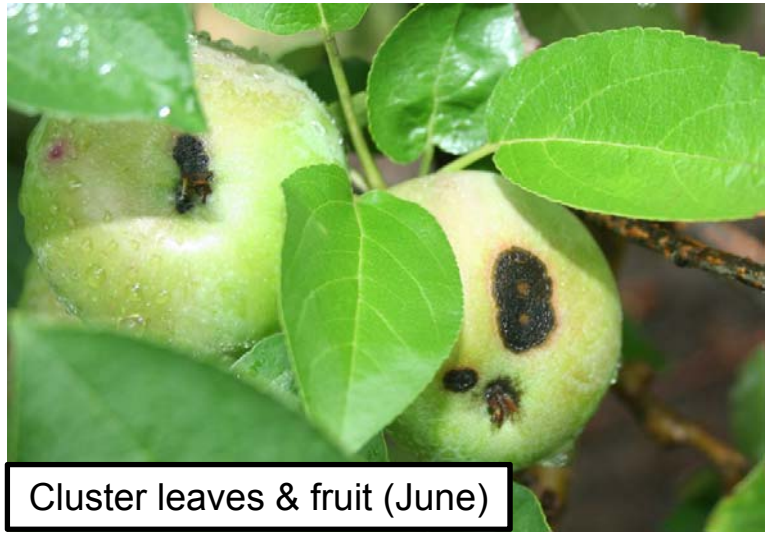
- 3.1-acre planting site Empire’ and ‘Jonagold’-M.9/M.111 interstem (18-20 years old)
- Widely-spaced two tree plots

Apple scab & powdery mildew trials

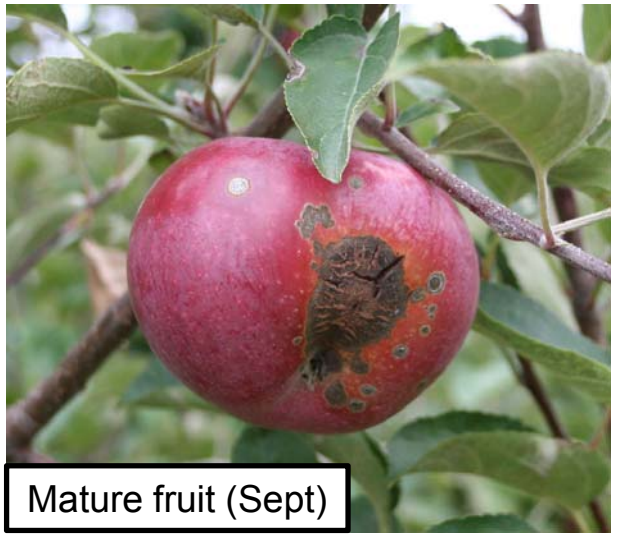
- Fungicide treatments
  - Dilute handgun application timed at **7-10 day intervals from TC- 2nd cover** or 14-21 days from 3rd-7th cover
  - Alternated with effective protectant standards ➔ not to exceed max applications (4 applications)

Apple scab trials

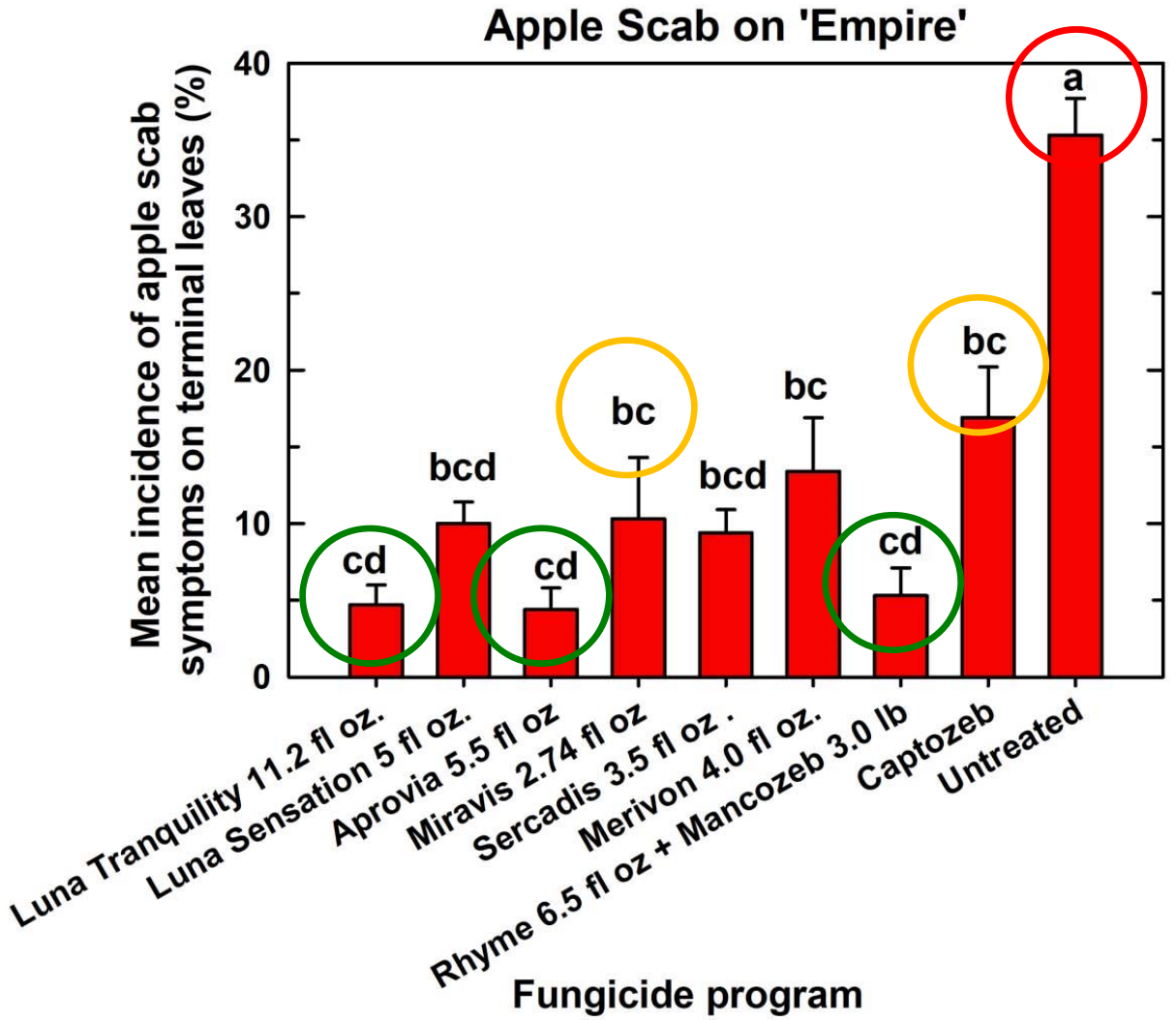
- Apple scab evaluation
  - Incidence any lesion on cluster leaves and fruit (June), terminal leaf scab (July), & **fruit (Sept)**


Cluster leaves & fruit (June)


Terminal leaves (July)

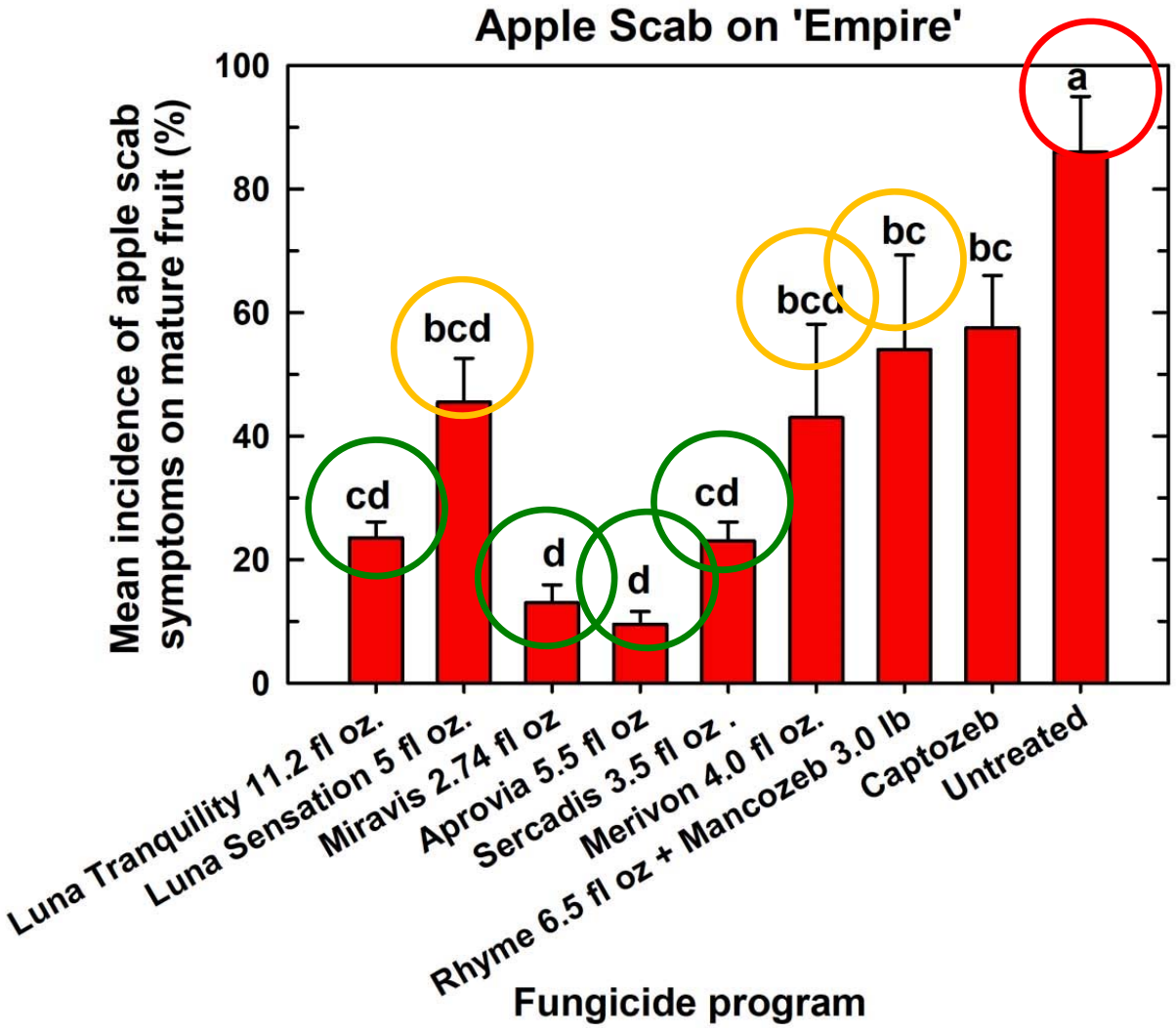

Mature fruit (Sept)

Apple scab trials (2016)



- **Dry year – little fruit infection:** SDHI(premixes) better than protectants, Miravis, Luna tranquility, Aprovia ≥ DMIs

Apple scab trials (2017)



- **Wet year – high levels of fruit infection:** Aprovia, Miravis, Luna tranquility, Sercadis, SDHI(premixes), > protectant & DMIs

Apple scab trials: Trends and considerations

- Apple Scab
  - DMIs still work on DMI resistant populations in dry years
  - QoI/SDHI premixes **may be affected** by practical resistant to QoI fungicides in wet years
  - Stand alone SDHI fungicides strong against apple scab: Aprovia & Miravis highly potent

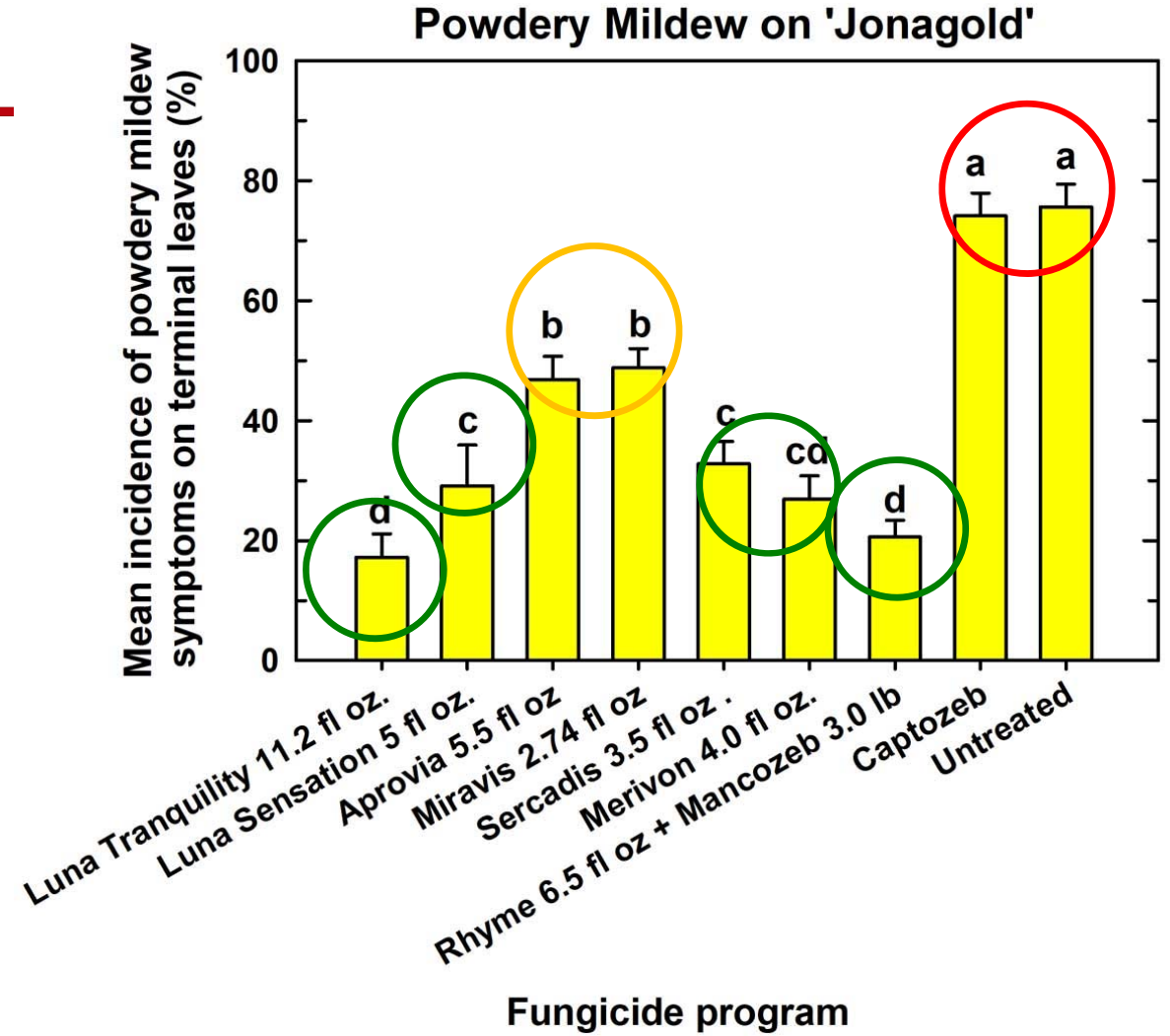
Powdery mildew trials

Disease assessment

- Powdery mildew:
  - Primary mildew (June) & Secondary mildew (July)

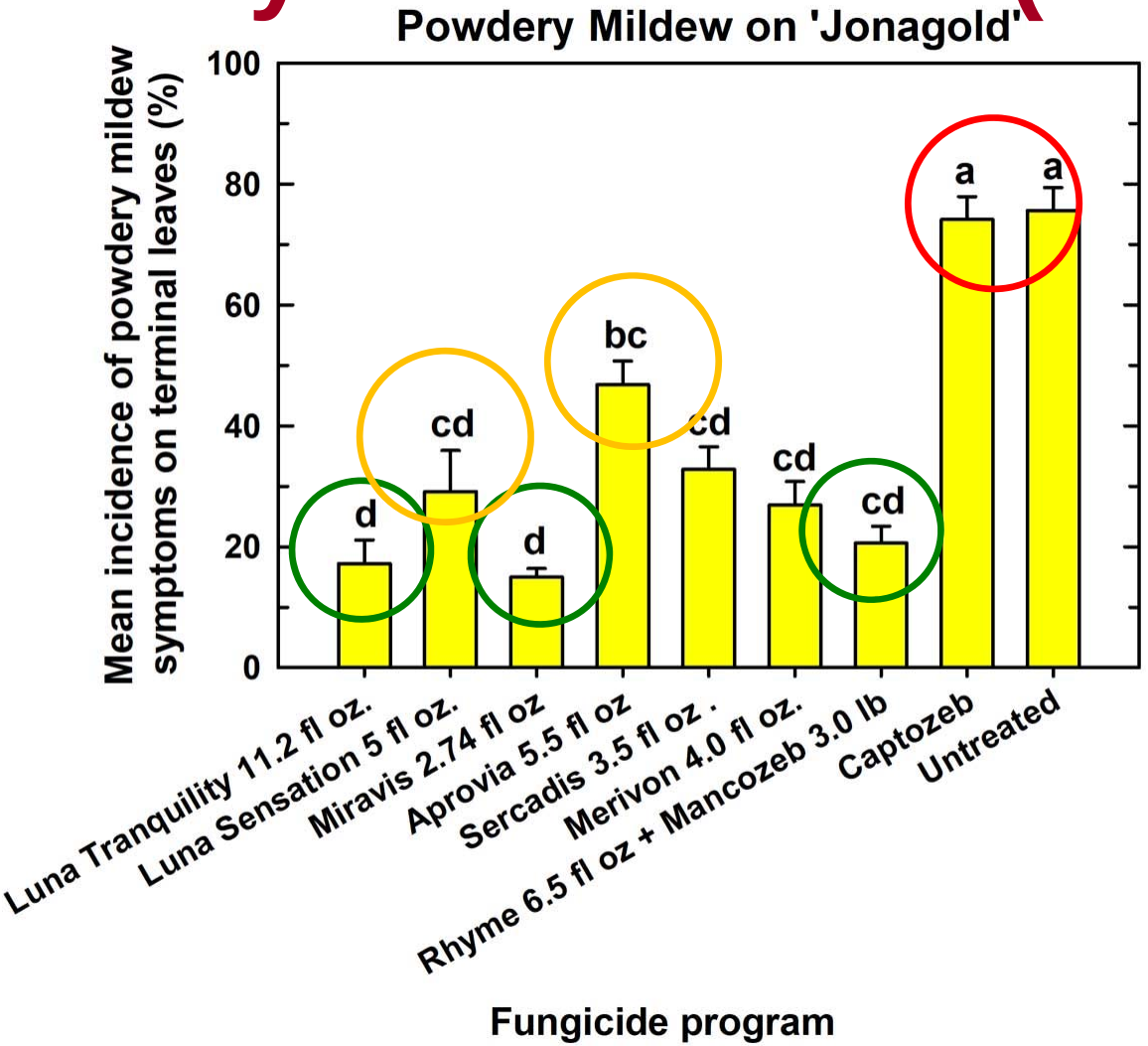
  - **Incidence (any lesion) & Severity (% leaf area)**

Powdery mildew trials (2016)



- **Dry year high mildew pressure**: SDHI premixes, HS DMIs (Rhyme & Rally) > standalone SDHIs

Powdery mildew trials (2017)



- **Wet year low mildew pressure** : SDHI premixes, HS DMIs (Rhyme & Rally), Miravis

Powdery mildew trials: Trends and considerations

- Powdery mildew
  - DMIs Topguard (Rhyme) or Rally still strongest mildew fungicides – high rates w/ mancozeb to manage DMI resistant scab
  - QoIs & SDHI-QoI premixes next best line of defense – even with QoI resistance
  - Stand alone SDHI fungicides slight effect against mildew under high pressure, **Miravis?**
  - Sulfur 3.33 lbs/100 7-10 day intervals from bloom to end of terminal growth **= QoIs**: **phyto & smell**

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- Efficacy of new fungicides for apple scab powdery mildew management
- **Efficacy of fungicides for post-harvest bitter rot management**
- Prohexadione Ca, Biologicals, & SARs for fire blight management

Post harvest concerns for 2017

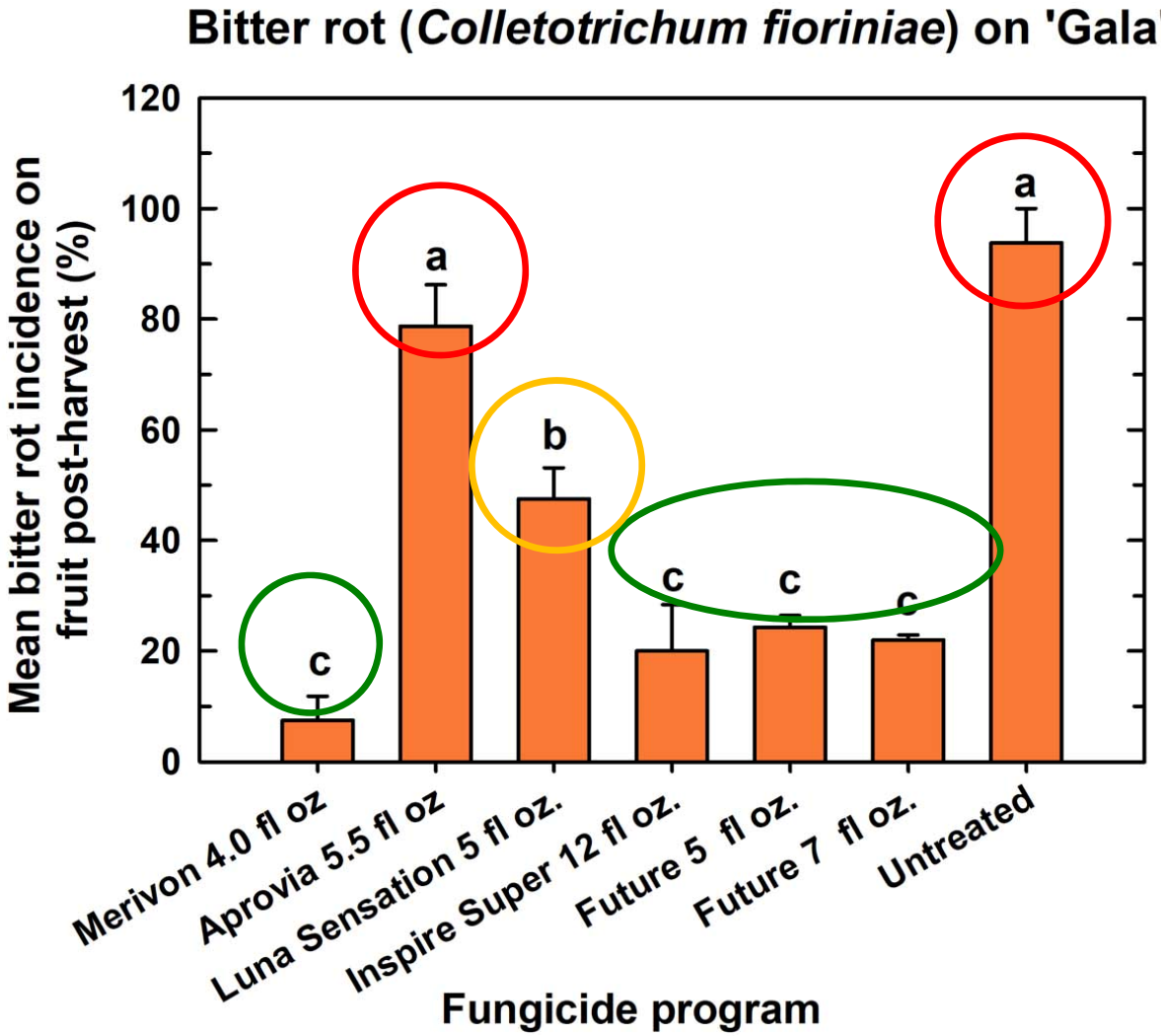
- Bitter pit and lenticel break down issues prevalent in “Honeycrisp” and other high-value varieties

- Such fruit often has latent infections of black, white, or bitter rot

Bitter rot trial (2017)

- 13 year old ‘Buckeye Gala’ on B.9 rootstock
- Treat trees with fungicides at harvest
- Fruit are inoculated & placed into cold storage
- Incidence and severity of bitter rot lesions

Bitter rot trials (2017)



- Note: Merivon, Inspire (AP) > Aprovia

Bitter rot trial: Trends and considerations

- Bitter rot
  - Pre- to Post harvest scenario– Merivon is best & Inspire super was good
  - Glomerella leaf spot – species from other regions (WV, PA, NC) affected a little differently

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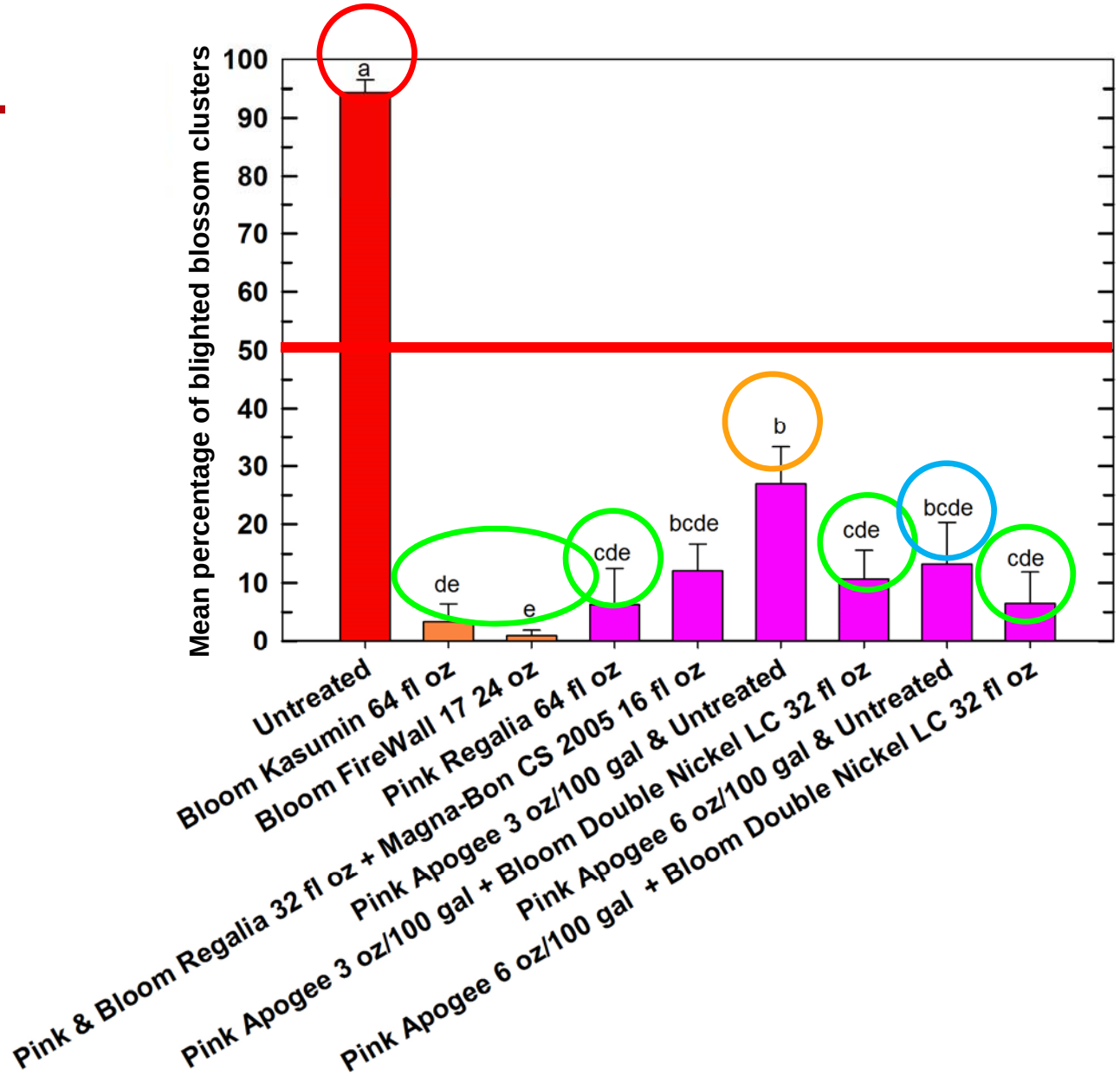
Research Question

Can prohexadione calcium and SARs help control blossom blight and reduce shoot blight if applied at pink?

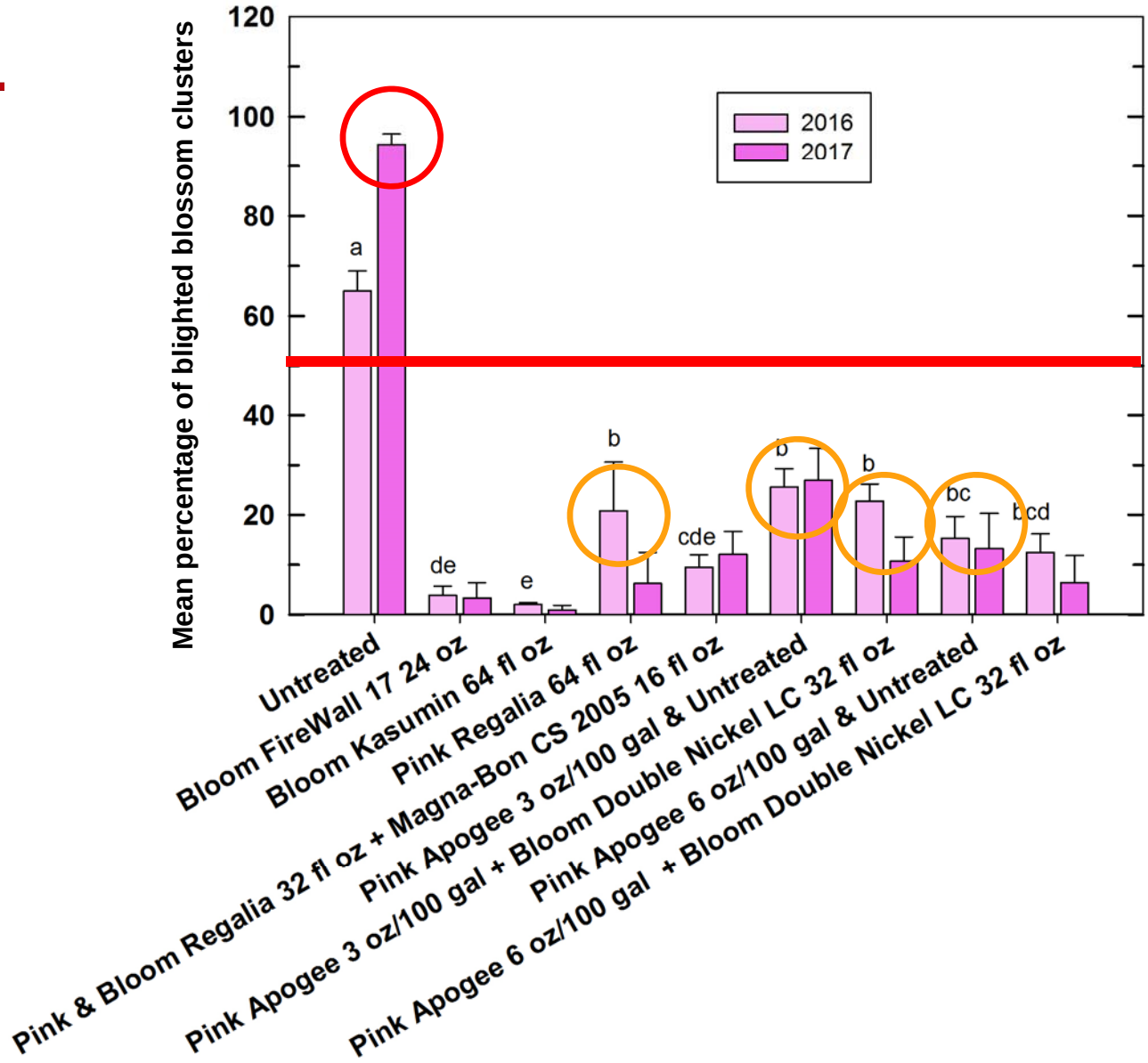
2017 PhCa & SAR Research

- 13 year old ‘Buckeye Gala’ on B.9 rootstock
- Artificial inoculum for blossom blight (Ea 273 at $1x10^6$ $CFUml^{-1}$) > serve as inoculum for shoot blight
- Inoculated @ 80% bloom

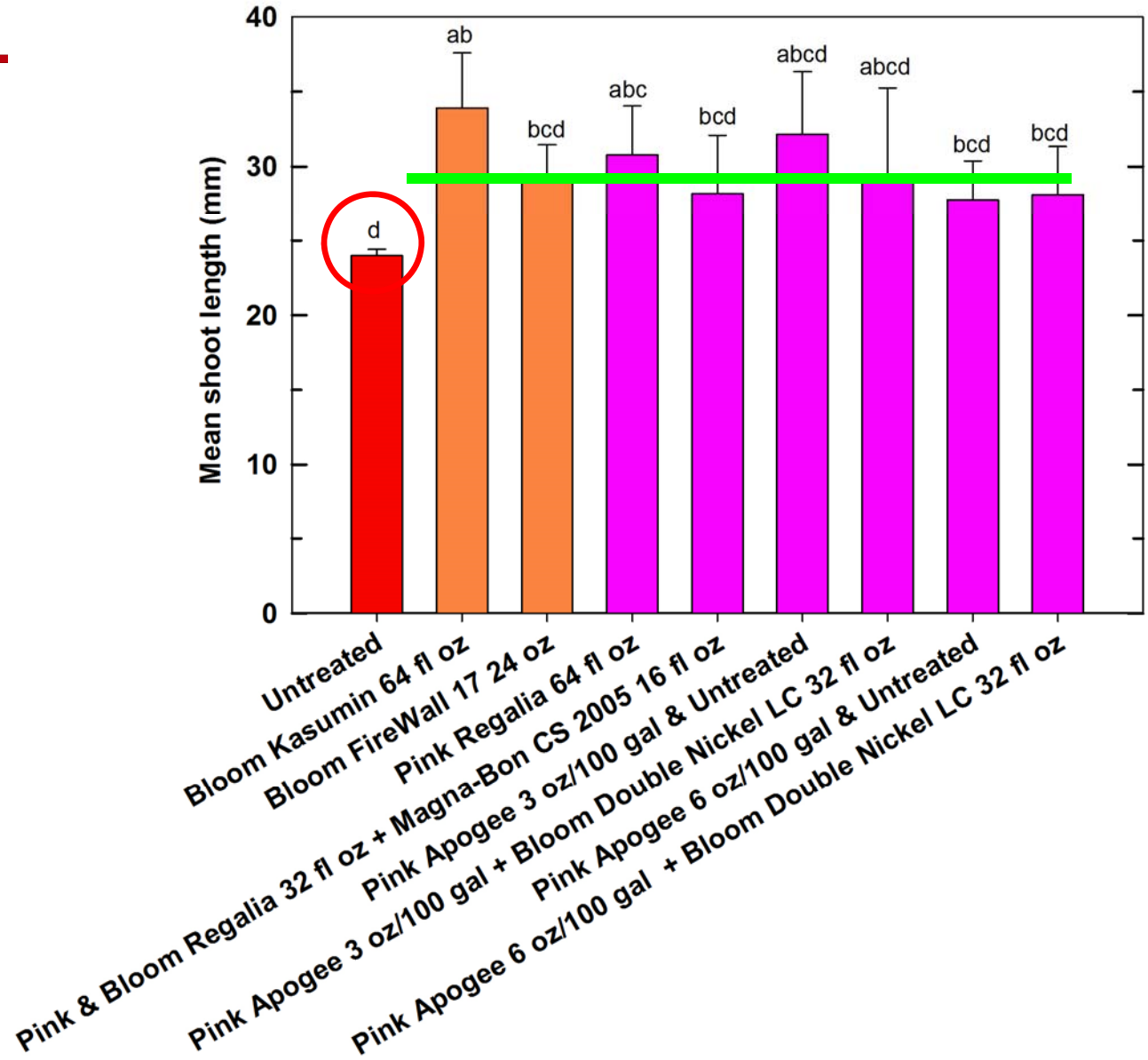
2017 Pink > Blossom blight



2017 Pink > Blossom blight

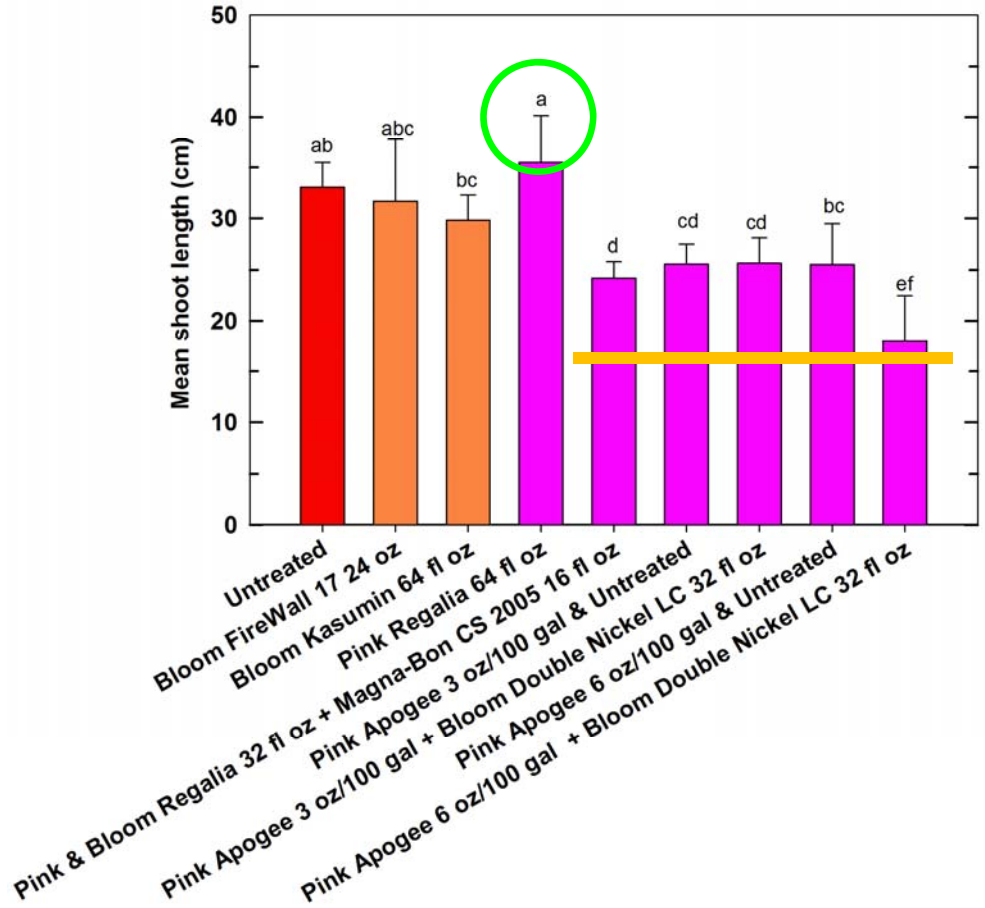


2017 Pink > Sept shoot length

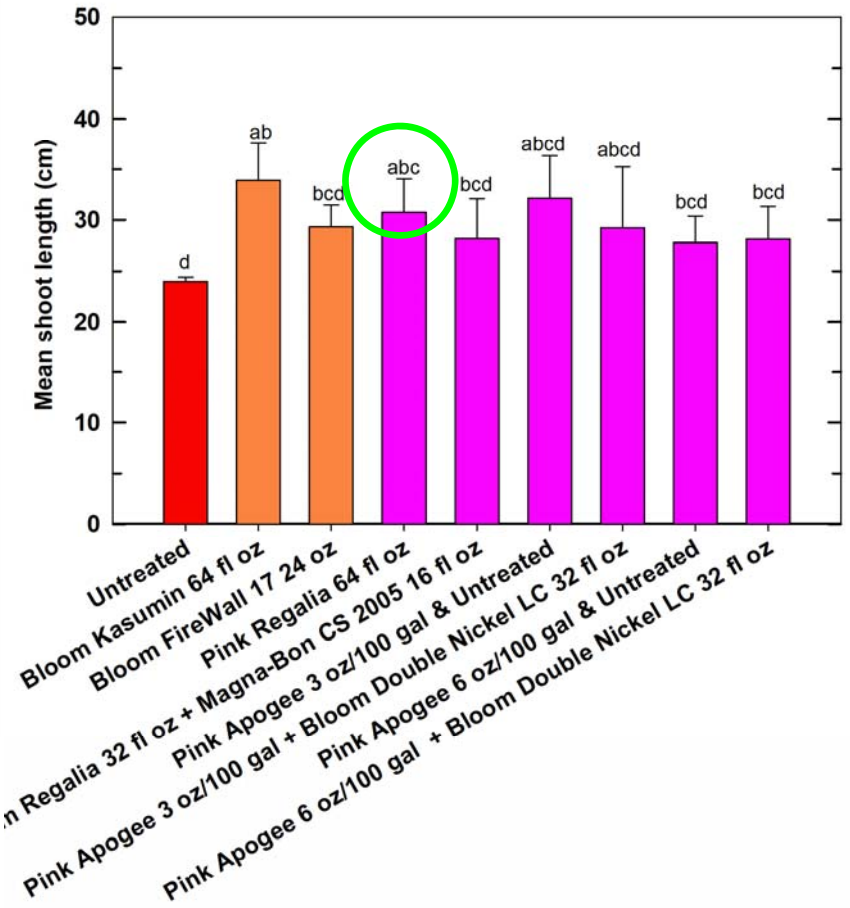


Pink > Sept shoot length

2016 Dry Season



2017 Wet Season



2017 Pink > Fire blight & Growth

- **PhCa at Pink:**
  - **1)** Decent BB & SB control (best at 6 oz)
  - **2)** Reduce bitter pit too? Pink application is recommended for cultivars prone to bitter pit
  - **3)** Manage high vigor varieties – holding tree training

2017 Pink > Fire blight & Growth

- **PhCa at Pink:**
  - **4)** Better with biological at bloom reduce inoculum
  - **5)** No impact on shoot growth by end of season (early on yes)

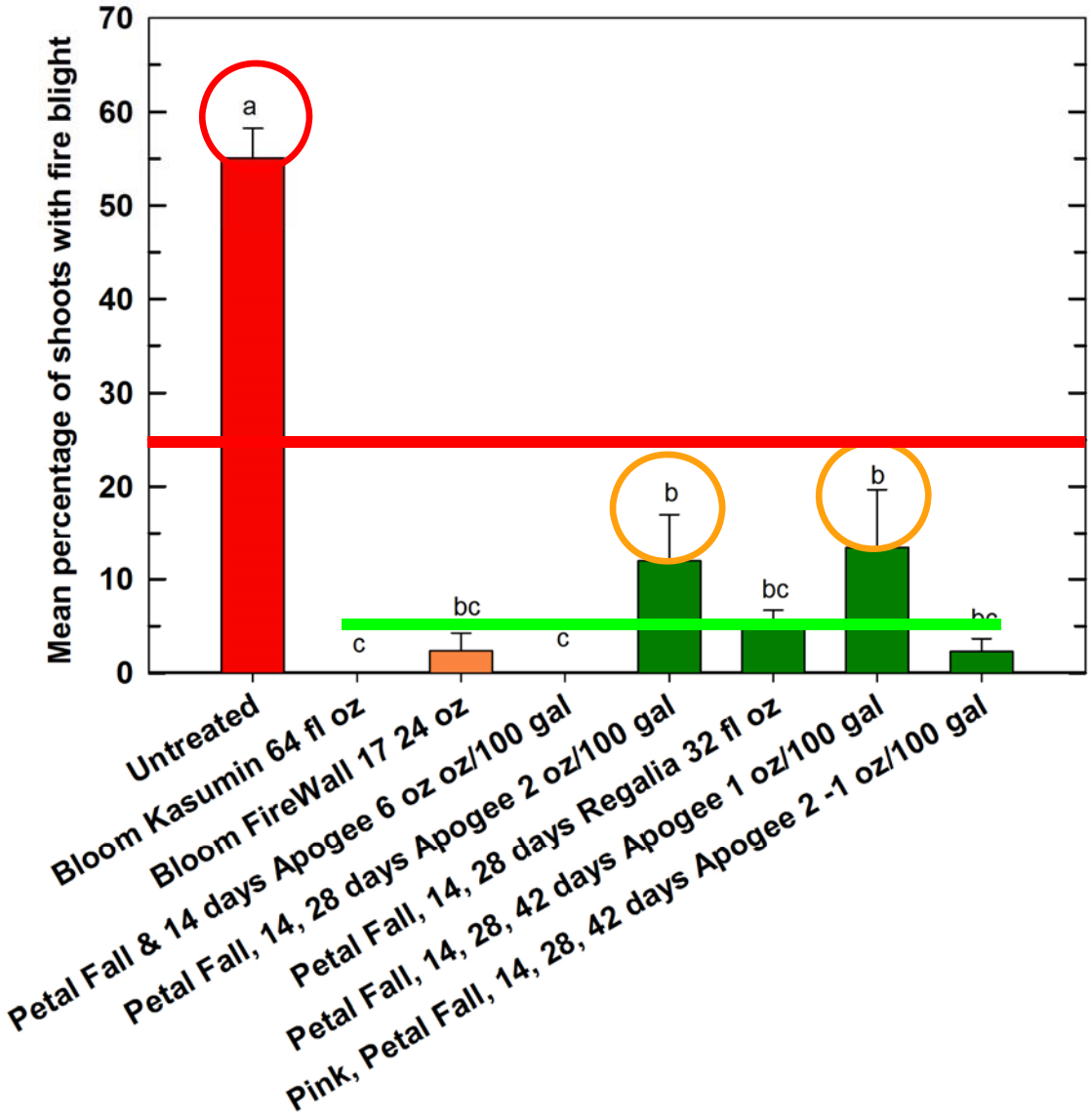
- **Regalia** (natural SAR):
  - **1)** Decent BB & SB control (best at 6 oz)
  - **2)** Better with biological at bloom reduce inoculum
  - **3)** No impact on shoot growth

Research Question

Can we use prohexadione calcium and SARs more effectively post-petal fall with low rates and different timings?

2017 PF+ on Shoot blight

Bloom: Double Nickel LC 32 fl oz



2017 PF+ on Shoot blight

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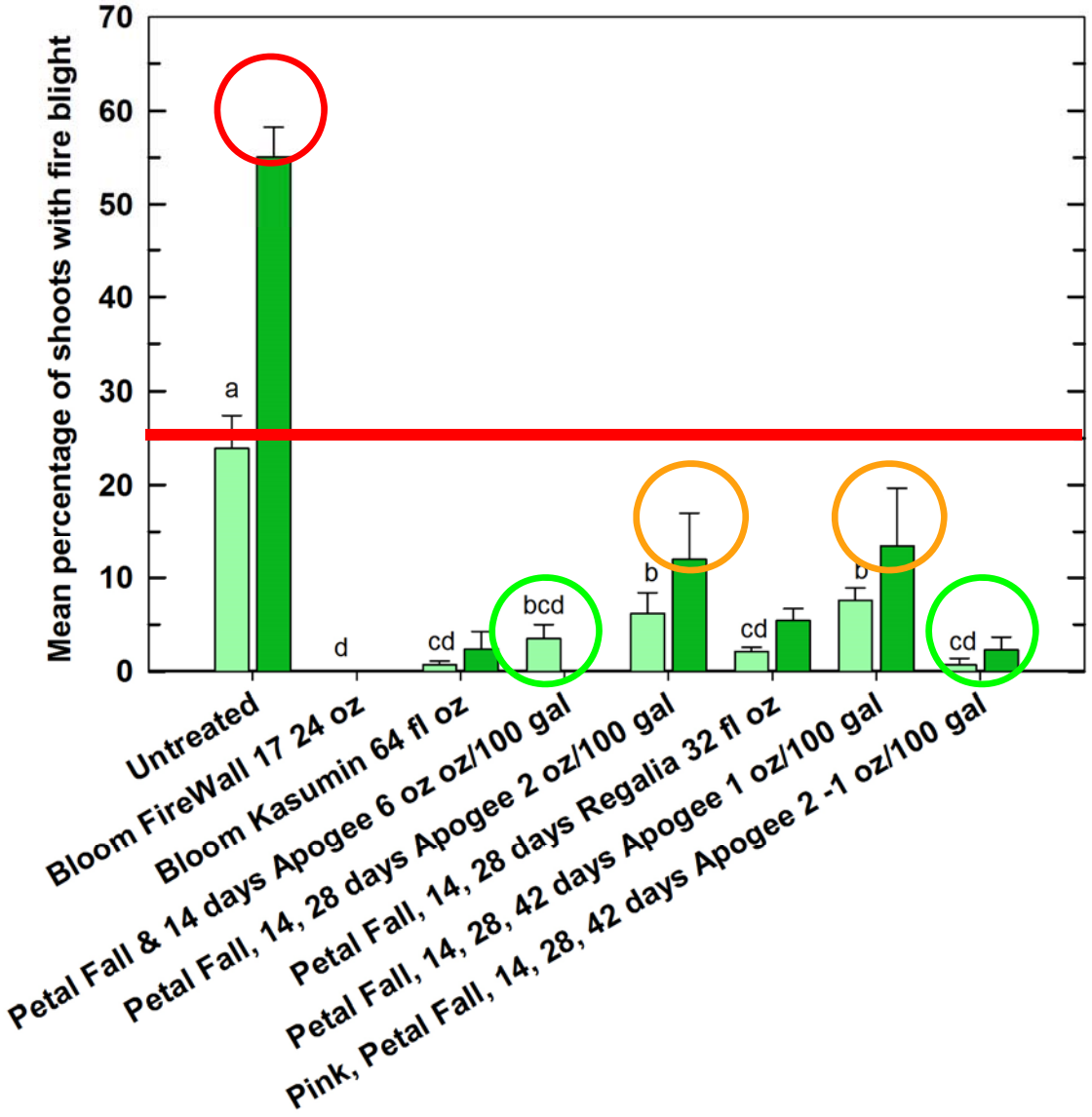
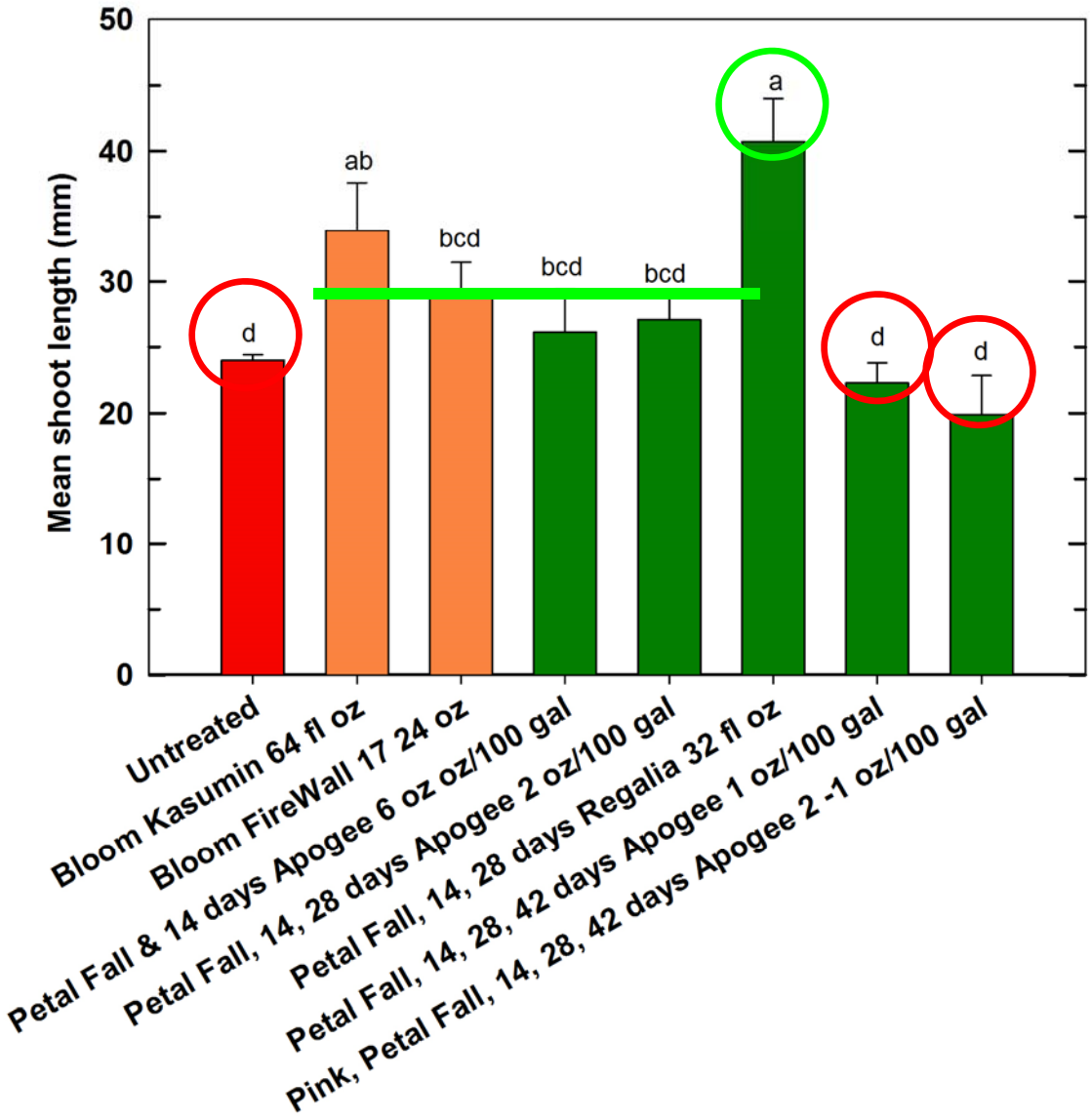


2017 PF+ on Sept shoot length



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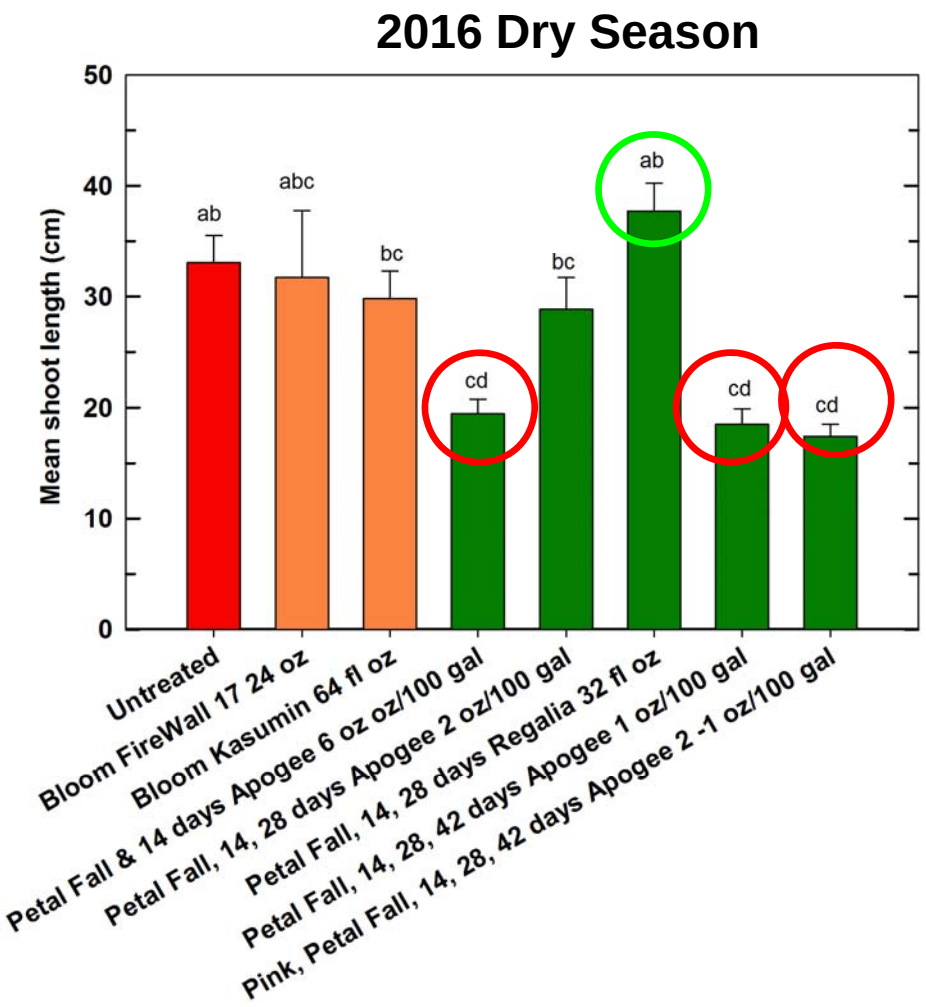

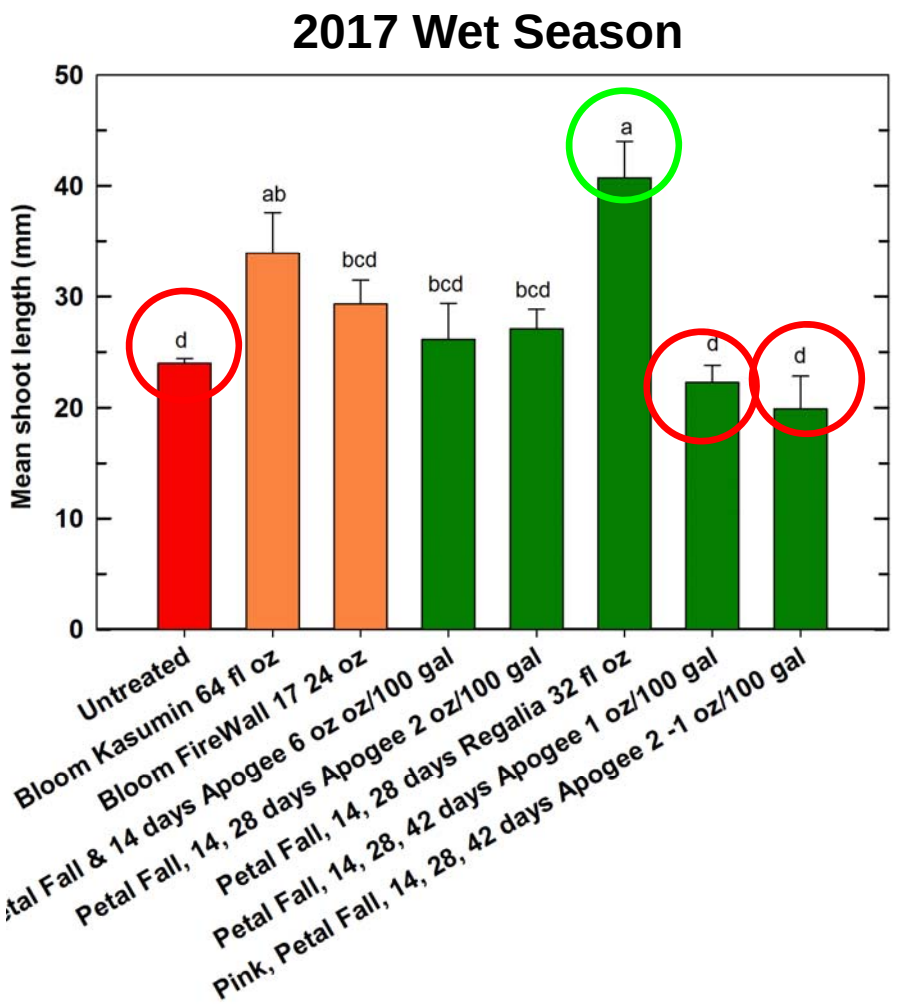

2017 PF + on Shoot blight & Growth

- **PhCa after petal fall:**
  - **1)** Excellent control of SB infections
  - **2)** Start early with low rate programs
  - **3)** Prolonged programs of low doses > slightly impede trees
- **Regalia** (natural SAR):
  - **1)** Excellent control of SB infections
  - **2)** No impact to nice shoot growth

2018 PhCa Research

Further refine prohexadione calcium applications at “pink” & season-long prohexadione calcium programs on young trees with no fire blight

Questions