

ABA for bitter pit control of HC

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Bitter Pit Control in Honeycrisp

- Ca is transported within the tree exclusively in the xylem
- Xylemic water movement to leaves and fruit is driven by transpiration i.e., stomatal activity (early fruit growth stage)
- Due to high transpiration rate of leaves compared with that of fruits, most of the xylemic water and Ca flow towards the leaves and away from fruit (competition)
- Calcium partitioning in Gala = 86% to shoots and leaves and only 14% to fruit (Lailiang Cheng)
- Increasing the ratio of fruit/leaf transpiration will be potential solution to improve Ca inflow into fruit and reduce Ca-related disorders in fruit

PRODUCT CONCEPT

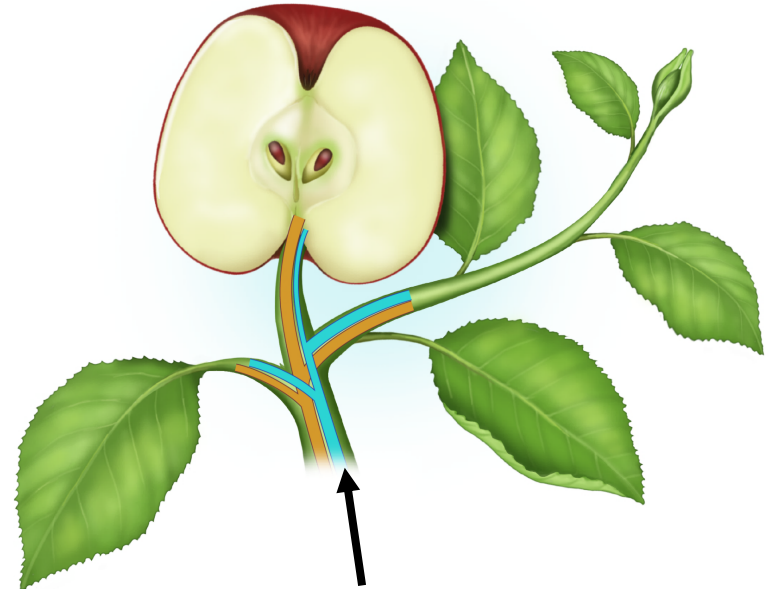
- ABA – registered product
 - wide range of uses

→ Reduces leaf transpiration
→ Regulates stomatal closure

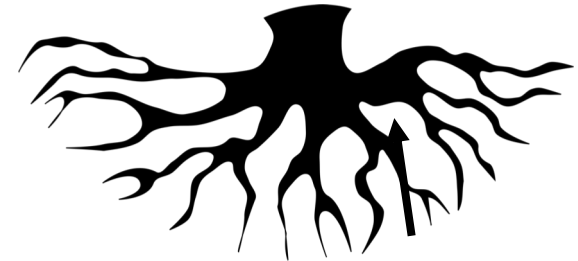
Mode of action:

- Increasing ABA levels in the leaves would:
- reduce leaf transpiration
 - improve Ca inflow into fruit
 - reduce Ca-related disorders
 - Bitter pit

Calcium transport



Water + Calcium



Xylem Function

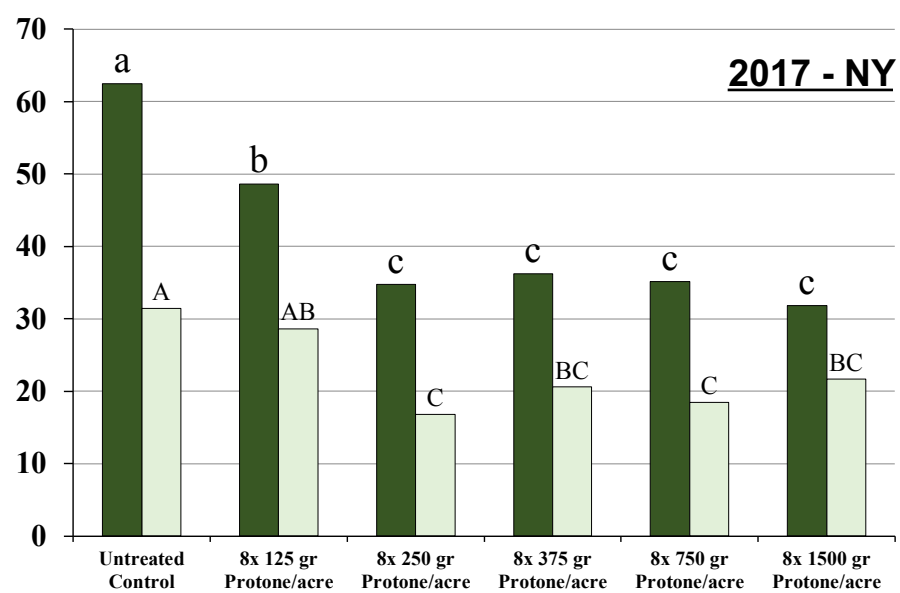
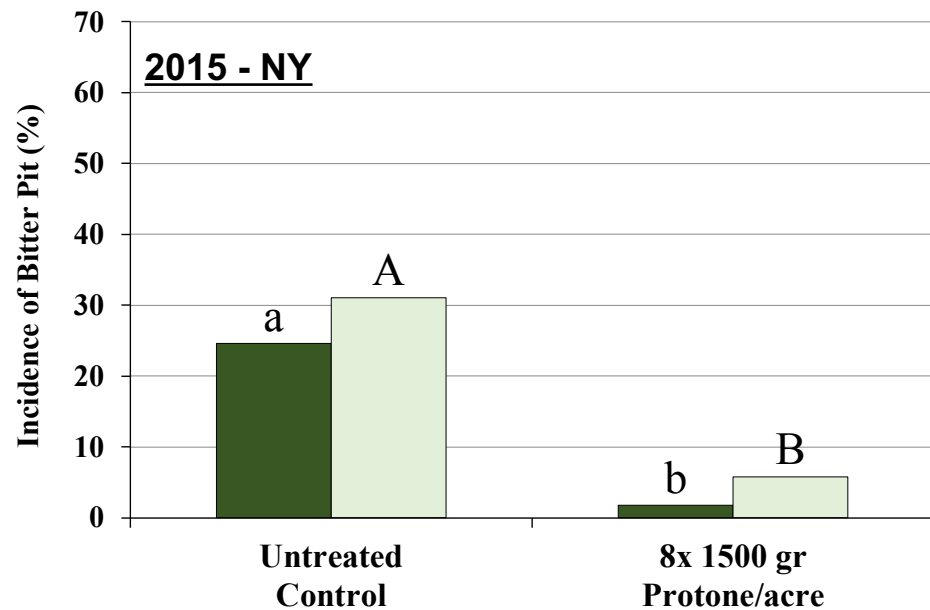
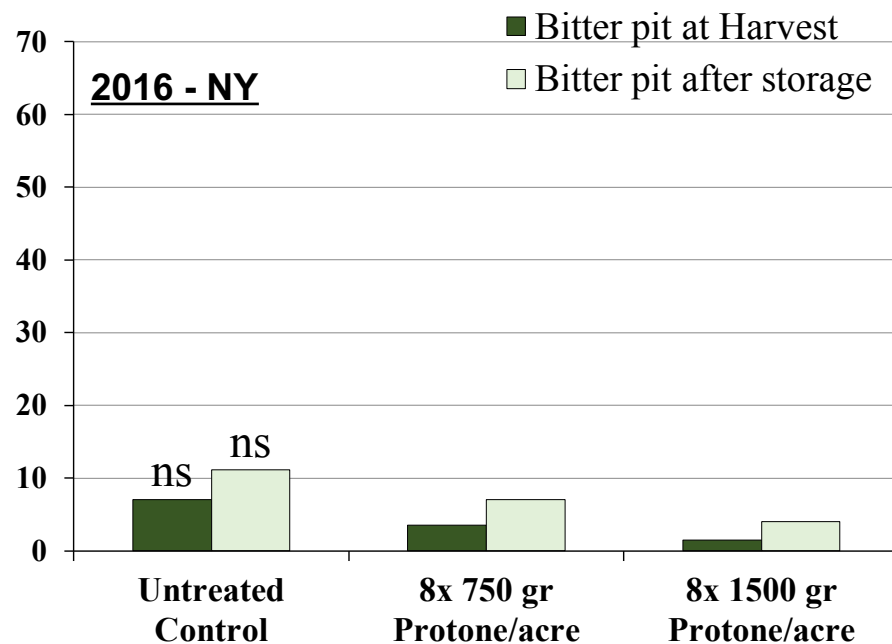
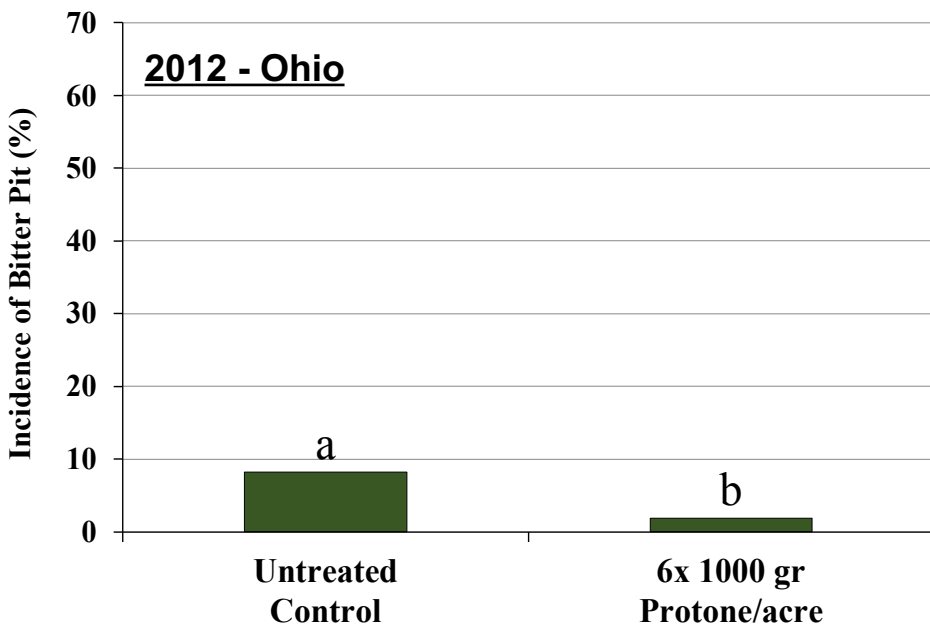
Untreated control



ABA 350 ppm



Incidence of bitter pit in Honeycrisp apple



NY: 400 ppm/100 gallons TRV dilute

The Effects of ABA on yield and Bitter pit

2018 results

Treatment	Fruit set (no./cluster)	Crop load (no/cm ² TCA)	Fruit No. per tree	Yield/tree (kg)	Fruit Size (g)	% Bitter Pit
UTC	0.31 bc	4.0 a	157 ab	38.4 ab	246 b	3.8 b
8x 400 ppm ABA - 15 days	0.29 c	3.6 a	132 b	34.0 b	257 b	4.3 b
8x 200 ppm ABA - 15 days	0.40 a	3.4 a	167 a	41.6 a	251 b	4.0 b
8x 100 ppm ABA - 15 days	0.38 ab	3.3 a	148 ab	36.3 ab	246 b	5.1 b
8x 66 ppm ABA - 15 days	0.29 c	3.5 a	153 ab	37.9 ab	248 b	2.8 b
5x 400 ppm ABA (weekly)	0.14 d	1.8 b	83 c	25.7 c	310 a	17.3 a
<i>Duncan (P<0.05)</i>	**	**	**	**	**	**

Overthinning

No ABA sprays



400 ppm ABA - weekly




Chemical thinning

Bloom: 8 oz AmidThin/acre

PF: 6 oz Pomaxa + 2 pt Carbaryl/acre

10-12mm: 6 oz Pomaxa + 2 pt Carbaryl/acre



Conclusions – 5 years study

ABA seems to be a promising tool for Bitter pit control in apples, specially for “Moneycrisp”;

No negative effects of ABA on fruit quality.

Thinning may occur when applied close to thinners and when temperatures are above 80F.

No phytotoxicity or significant leaf yellowing was observed;

More investigation should be done regarding the number of sprays, timing and rates;

