

**Horticulture Section, Cornell University  
Geneva, NY**

A photograph of a cherry orchard with rows of trees in bloom, covered in white flowers. A green grassy path runs down the center of the orchard.

# ***PGR Strategies for Improving Production Practices***

**Poliana Francescatto**



# PGRs for Fruit Production

- Increasing fruit set (AVG/ReTain; Promalin after frost damage)
- Fruit thinning (6BA, NAA, metamitron, ACC, ABA)
- Growth control (Apogee)
- Fruit russet control (GA4/7-ProVide)
- Fruit shape control (GA4/7 + 6BA - Promalin)
- Fruit color improvement (MeJ-Blush, Stimplex)
- Fruit maturity and fruit drop control (Retain/NAA/Harvista)



# Ongoing PGRs Projects in Geneva

- 1) Validate the accuracy of the Precision Thinning Protocol using the carb and FGR model;**
  - 2) Develop improved thinning treatments for existing and new varieties;**
  - 3) Testing new compounds for fruit thinning;**
  - 4) Develop return bloom treatments to overcome biennial bearing;**
  - 5) Investigate new strategies to control bitter pit;**
  - 6) Develop improved pre-harvest drop control strategies;**
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# Ongoing PGRs Projects in Geneva

*What we  
have found  
so far!!*





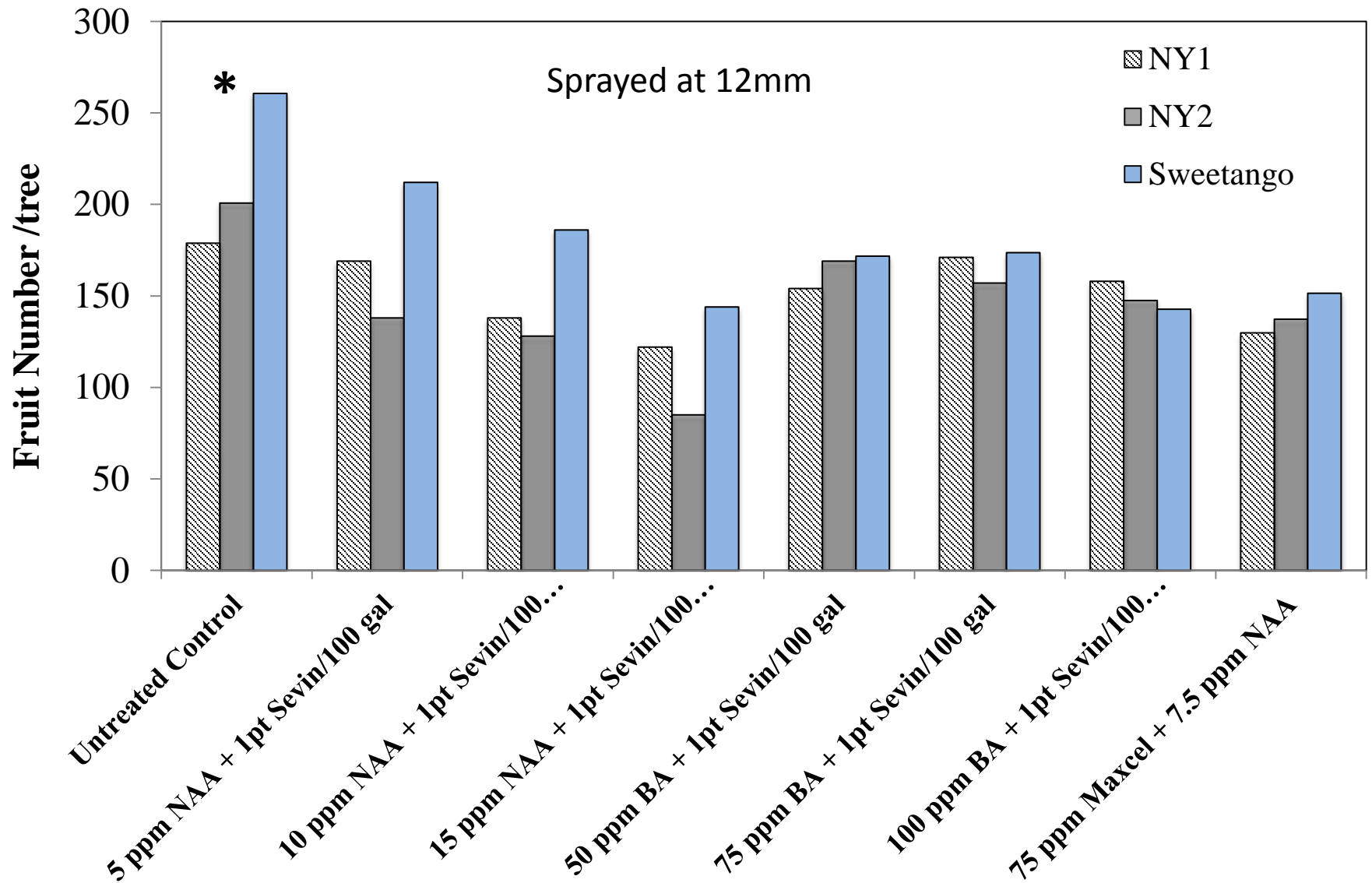
**NY1 – SnapDragon, NY2 – Rubyfrost, Sweetango**  
**(Planted in 2010 - M9/337)**



**Rubyfrost**



# NY1 – SnapDragon, NY2 – Rubyfrost, Sweetango (Planted in 2010 - M9/337)





**Untreated Control**



**15ppm NAA + 1pt Sevin at 12mm**




**Rubyfrost**



# Testing ACC for fruit thinning

- Precursor of ethylene
- Works well as pome and stone fruit thinner
- Applied up to 20 mm fruitlet size (after thinning window - RESCUE THINNER)
- Not registered, to be registered in 5-6 years from now
- “Works also as apple coloring agent (ethylene effect) – to counteract ReTain’s color depressing effect”





## Testing new compounds for fruit thinning

### **Determine the effect of ACC on fruit thinning of Golden Delicious and Cameo.**

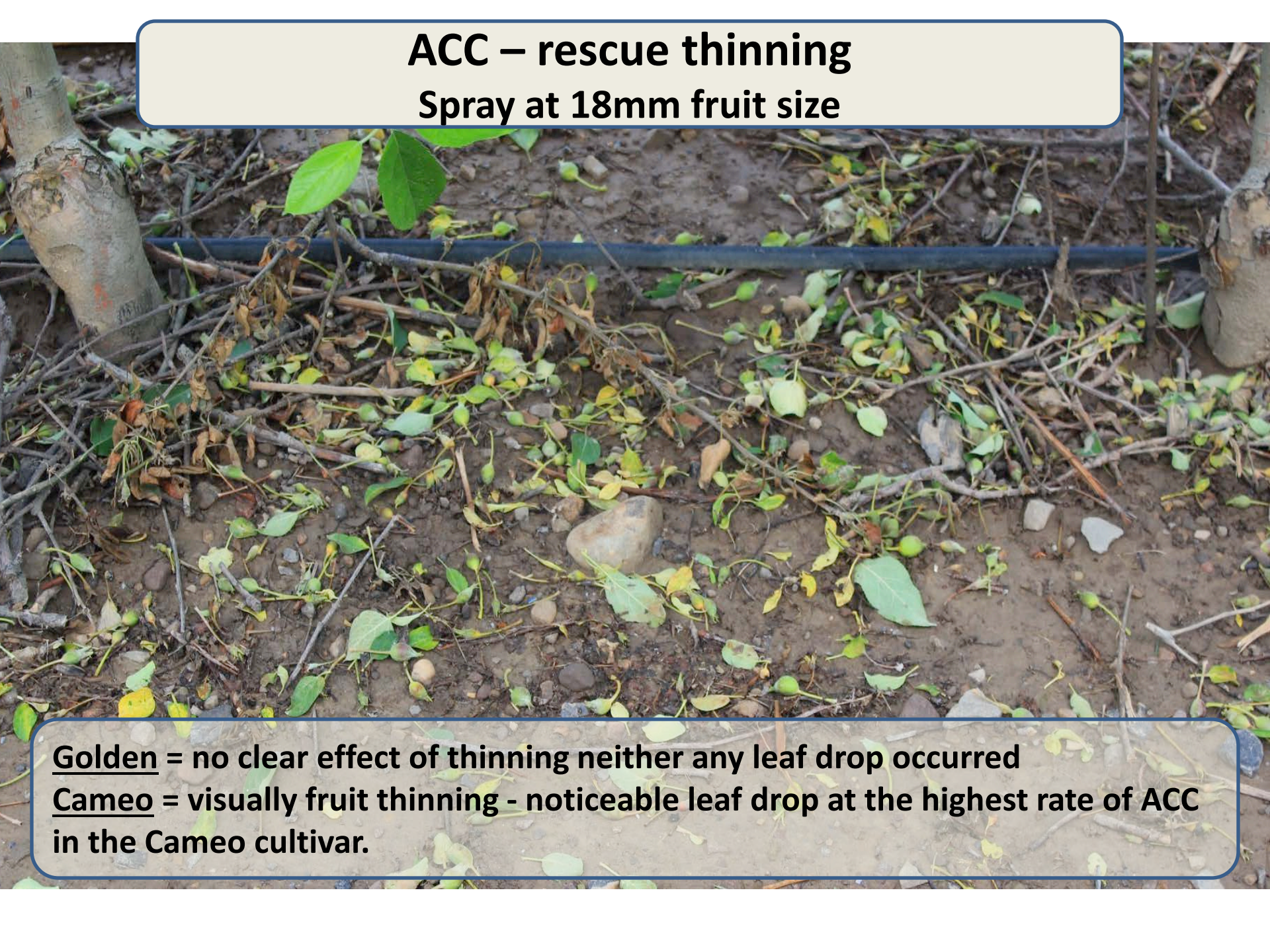
<b>Treatment</b>	<b>Date of Application</b>
Untreated Control	
150 ppm ACC + Silwet	18mm
300 ppm ACC + Silwet	18mm
450 ppm ACC + Silwet	18mm
Ethephon 2pt/100gal + 1 pt oil/100gal	18mm
64oz Maxcel + 150 ppm ACC + Silwet	18mm
64oz Maxcel+ 1 pt Sevin/100 gal at 10mm then later 150 ppm ACC + Silwet at 18mm	10mm 18mm
64oz Maxcel + 1pt Sevin/100gal +1pt oil/100 gal	18mm

It seems the effect of ACC is cultivar-dependent.

Golden = no clear effect of thinning neither any leaf drop occurred

Cameo = visually fruit thinning – noticeable but not damaging leaf drop at the highest rate of ACC in the Cameo cultivar.





## ACC – rescue thinning

Spray at 18mm fruit size

**Golden** = no clear effect of thinning neither any leaf drop occurred  
**Cameo** = visually fruit thinning - noticeable leaf drop at the highest rate of ACC in the Cameo cultivar.



**64oz Maxcel at 10mm + 150ppm ACC + Silwet at 18mm**



# Testing Metamitron (Brevis) for fruit thinning

- Sugar beet herbicide
- Can cause phytotoxicity (leaf damage)
- Applied at normal thinning window (2x)
- Works best in carbohydrate deficit
- Registered in EU, to be registered in the US in the near future



# Efficacy of metamitron in Geneva –2015

Brevis® 15% - Sugar beet herbicide

**Location:** Experimental orchard at Cornell Station in Geneva, NY

**Variety/age:** Crimson Gala/M9 – 17 years old (1998)

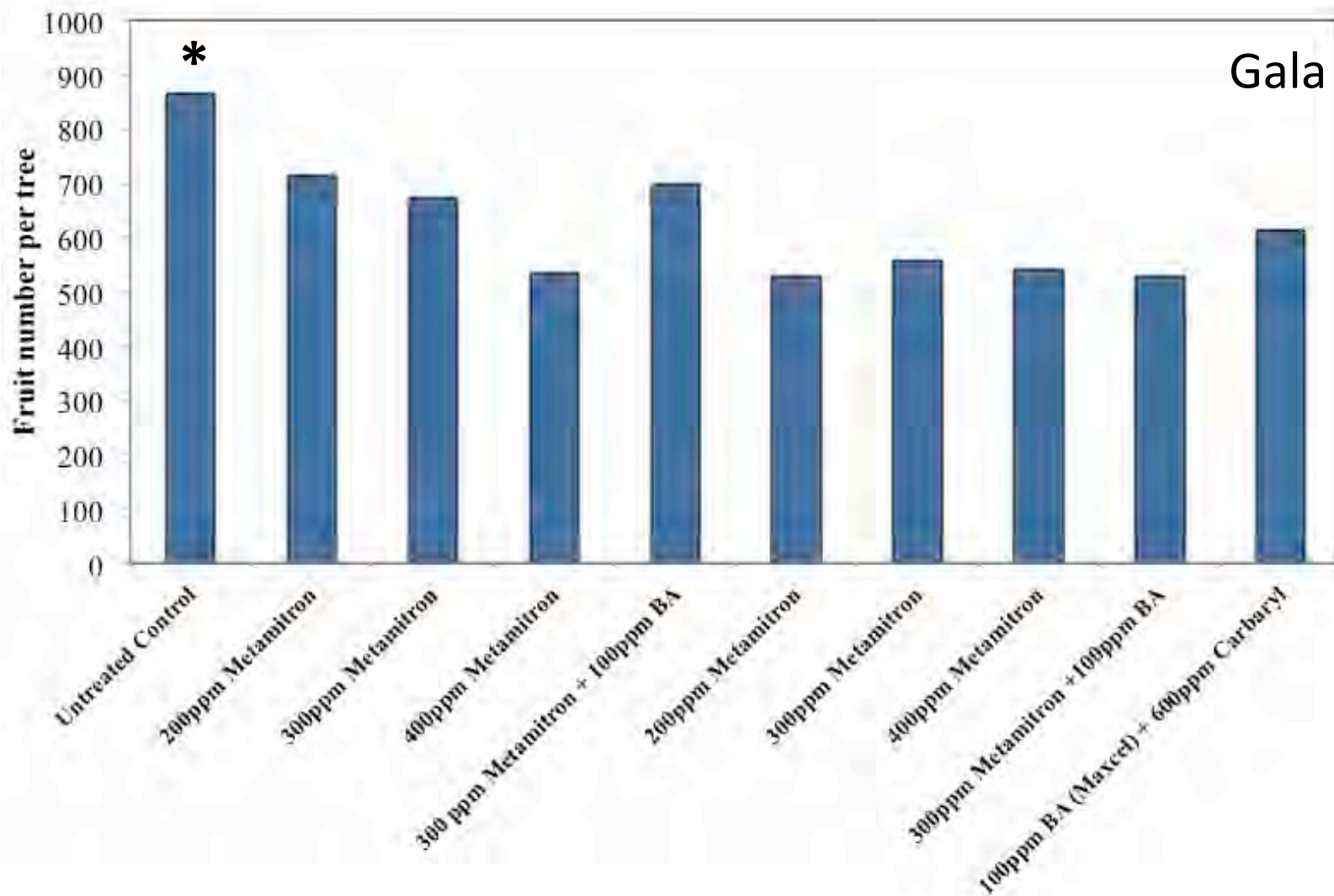
**Tree density:** **558** trees/acre

**Petal Fall: 05/18/15 and 12mm: 05/21/15**

**Treatments:**

- Control
- Metamitron 200 ppm PF
- Metamitron 300 ppm PF
- Metamitron 400 ppm PF
- Metamitron 300 ppm+ 100ppm BA PF
- Metamitron 200 ppm 12mm
- Metamitron 300 ppm 12mm
- Metamitron 400 ppm 12mm
- Metamitron 300 ppm+ 100ppm BA 12mm
- BA 100 ppm + 1pt Sevin 12mm

# Efficacy of metamitron in Geneva –2015





## Results from Brazil



**Untreated trees**



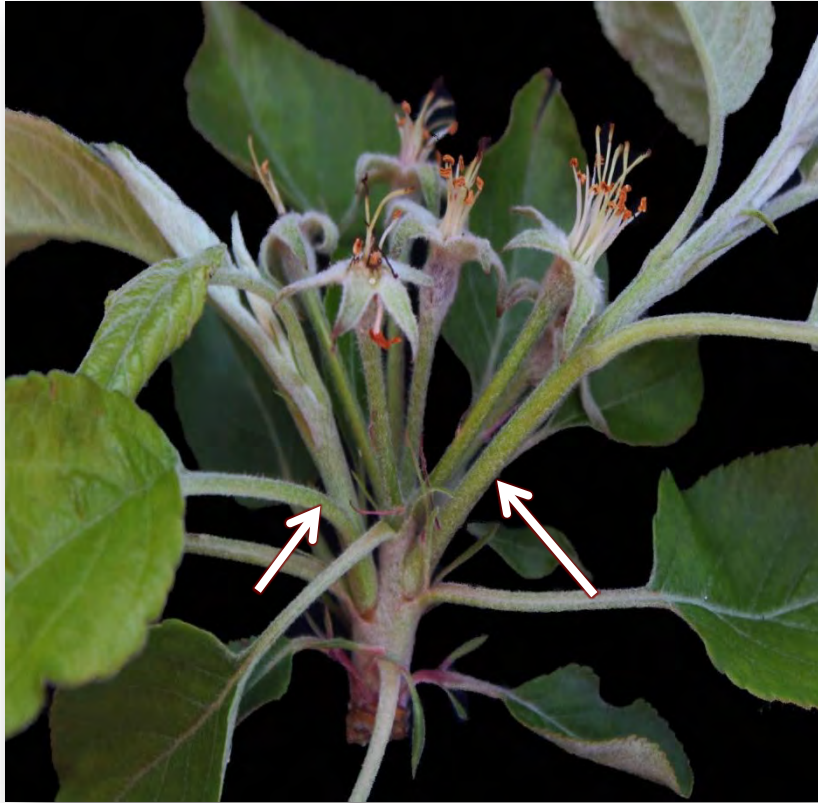
**100 ppm Metamitron + BA 60 ppm at petal fall**

# ABA

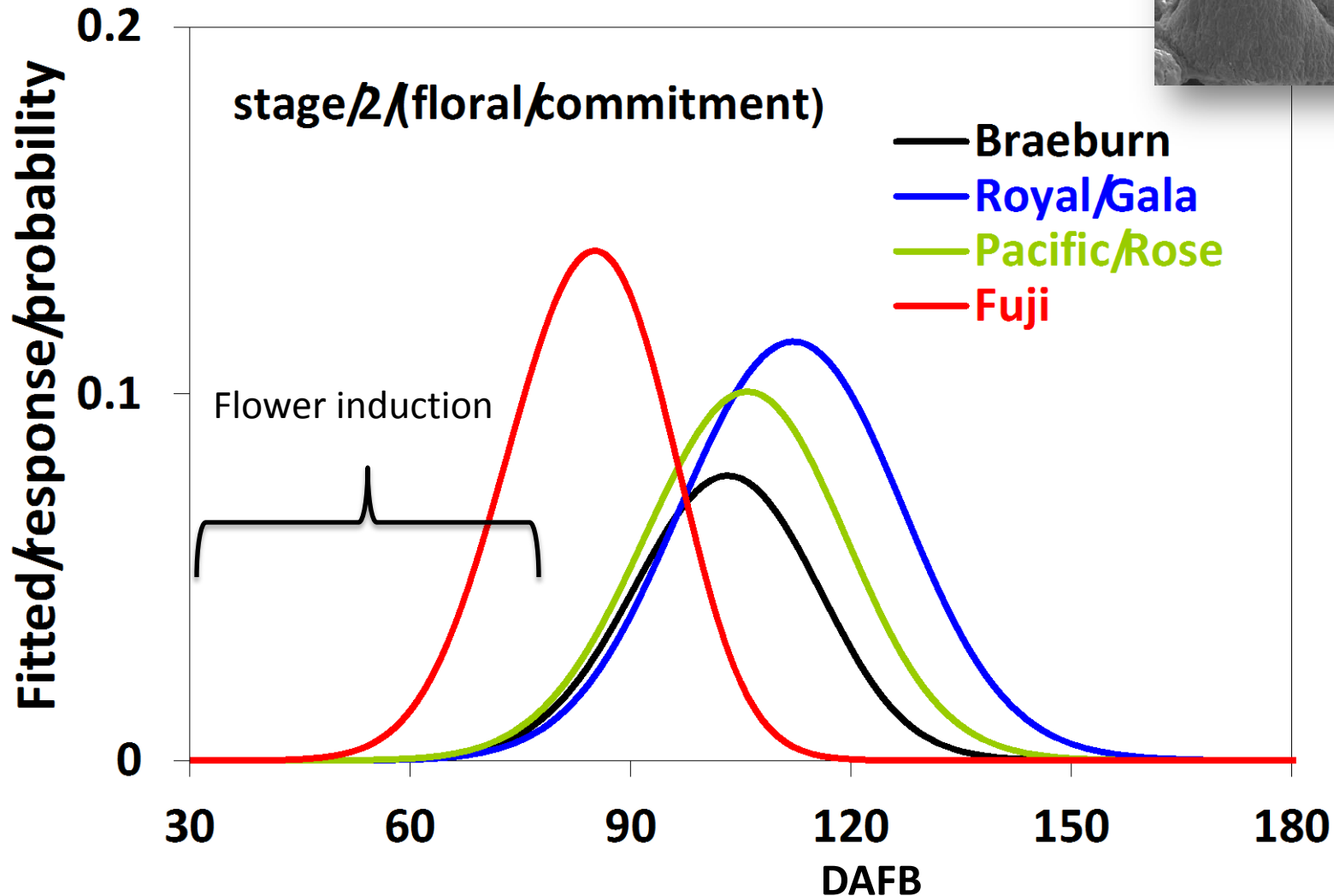
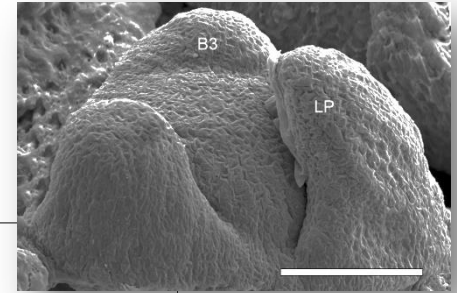
- ABA is a mild apple/pear thinner
- Good combination partner for other chemicals (6-BA)
- Works best in carbohydrate deficit
- Applied at 150-400 ppm
- Registered as grape coloring agent, to be registered for apple and pear post-bloom thinning (for ORGANIC production, as well!)



## *Flower induction*



# Flower initiation in apples





# Control of Biennial Bearing

**To promote return bloom of apple trees cvs.  
Honeycrisp and Fuji**

Trt No.	30 DAFB	37 DAFB missed	44 DAFB	51 DAFB	58 DAFB	65 DAFB
1.	Untreated control	Untreated control	Untreated control	Untreated control	Untreated control	Untreated control
2.	Ethephon	Ethephon	Ethephon	Ethephon	Ethephon	Ethephon
3.	NAA	NAA	NAA	NAA	NAA	NAA
4.	Ethephon +NAA	Ethephon +NAA	Ethephon +NAA	Ethephon +NAA	Ethephon +NAA	NAA
5.	Ethephon	Ethephon	Ethephon	NAA	NAA	NAA
6.	NAA	NAA	NAA	Ethephon	Ethephon	NAA
7.	Ethephon +NAA	Ethephon +NAA	Ethephon +NAA	NAA	NAA	NAA
8.	NAA	NAA	NAA	Ethephon +NAA	Ethephon +NAA	NAA

Results – to be analyzed in 2016

**Small doses**

## Pre-harvest drop control:

**To study the effect of Retain and/or Harvista on fruit drop control and quality at harvest and after storage;**

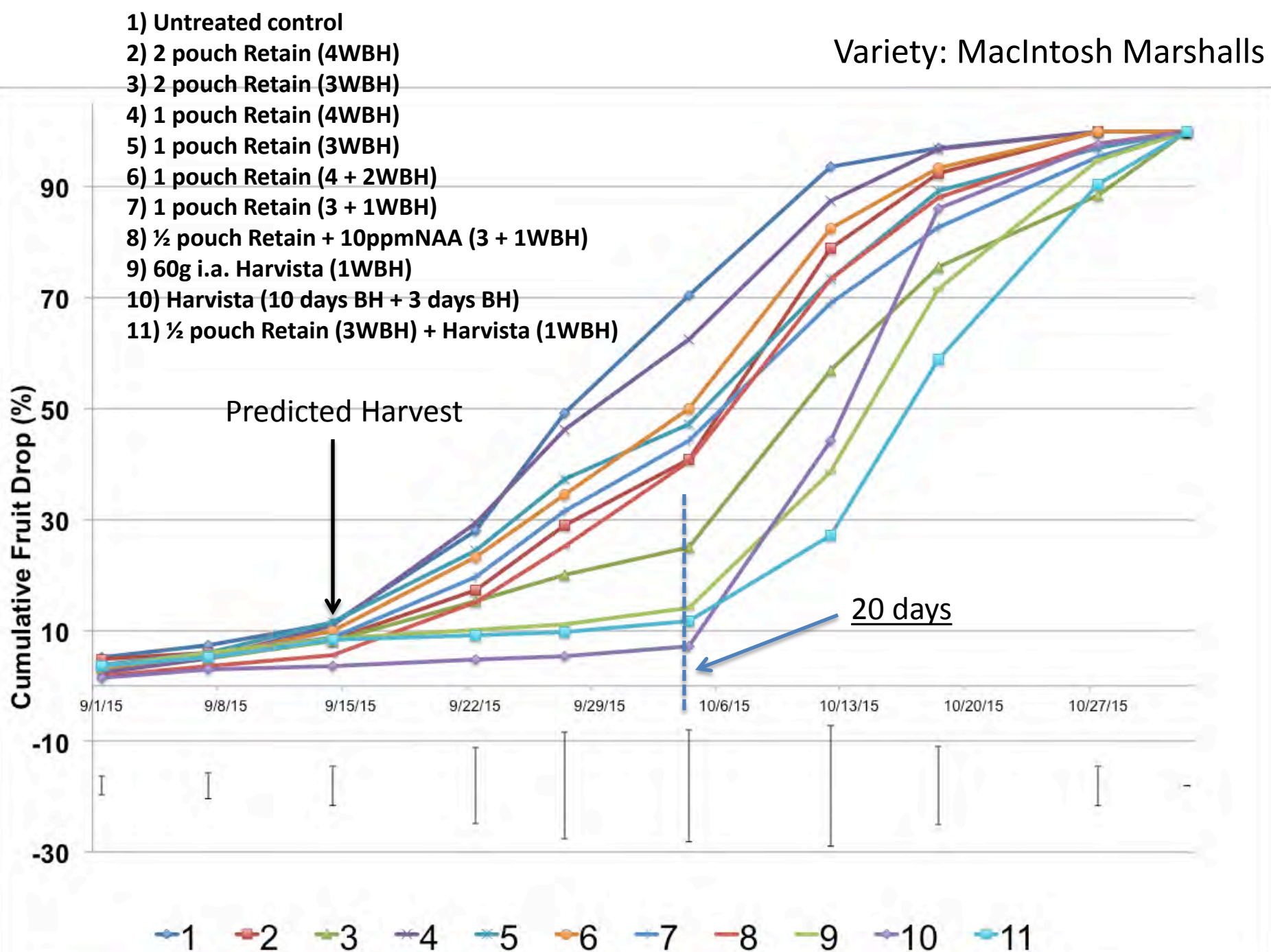
Variety: MacIntosh Marshalls/M9  
19 year old trees

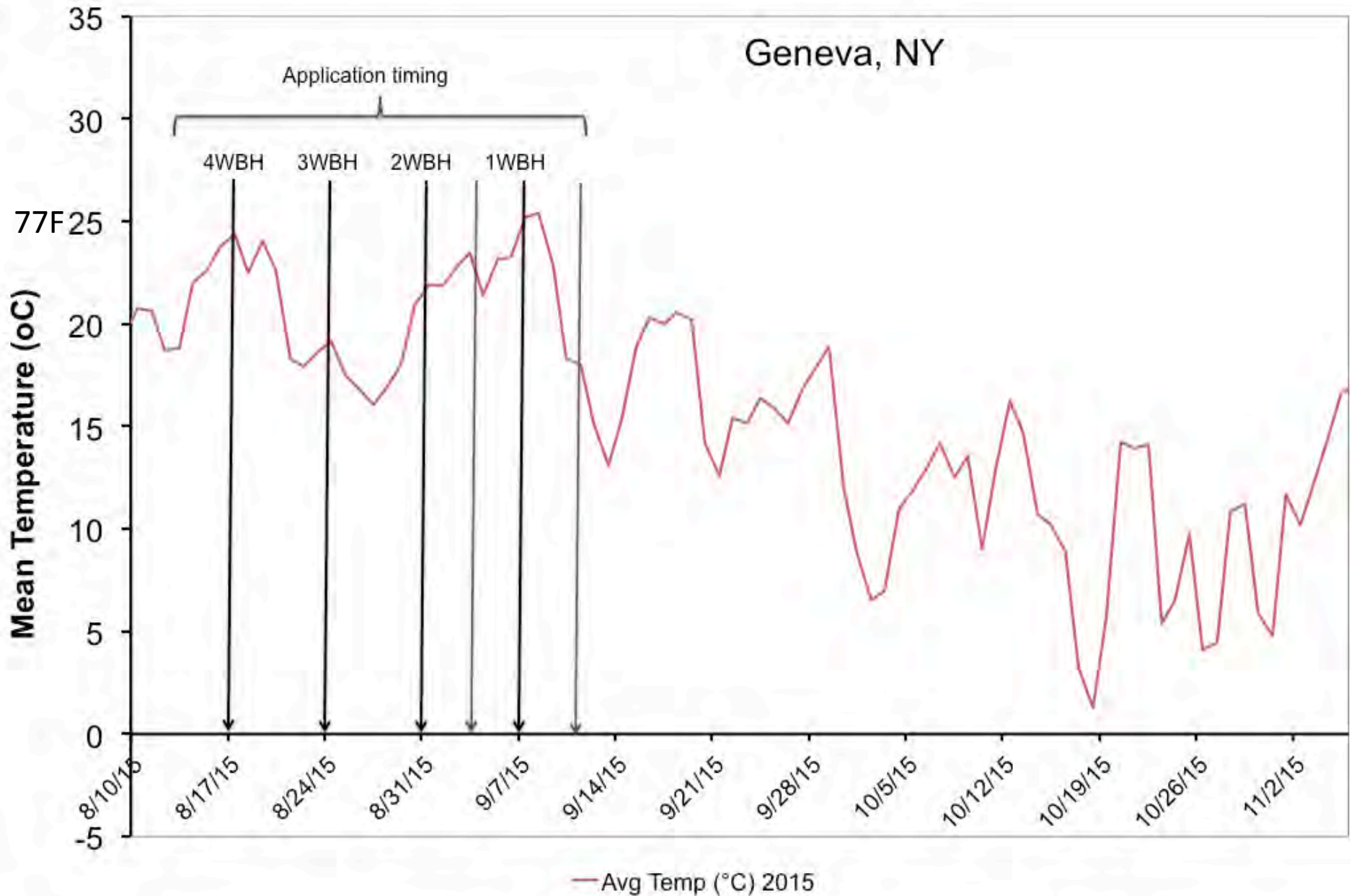
- % Fruit drop (from 9/14 (2WBCH) to 10/27;
- Fruit quality at harvest (color, firmness, starch, sugar) – 5-6 weekly picks;
- Fruit quality after regular cold storage (firmness, sugar and disorders)





Variety: MacIntosh Marshalls







# Blush + Stimplex

200ppm PDJ + 6pt Stimplex (4WBH+2WBH)







Untreated control tree





Department of Horticulture  
Cornell University, Geneva - NY

*Suggestions for  
2016??*

*Thank you!!*

