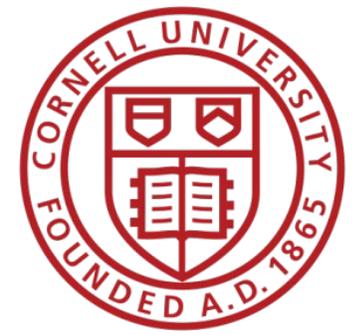


# Ways to Improve Color in your Fruit/ Research Updates



**Craig Kahlke, Fruit Quality Management  
CCE-Lake Ontario Fruit Program  
2026 LOF Winter Fruit Schools  
February 4-5, 2026**



Apples



Apricots



Asian Pears



Blueberries



Cherries



Currants



Gooseberries



Nectarines

more  
crops

*A partnership between Cornell University and the CCE Associations in these five counties: Monroe, Niagara, Orleans, Oswego & Wayne.*

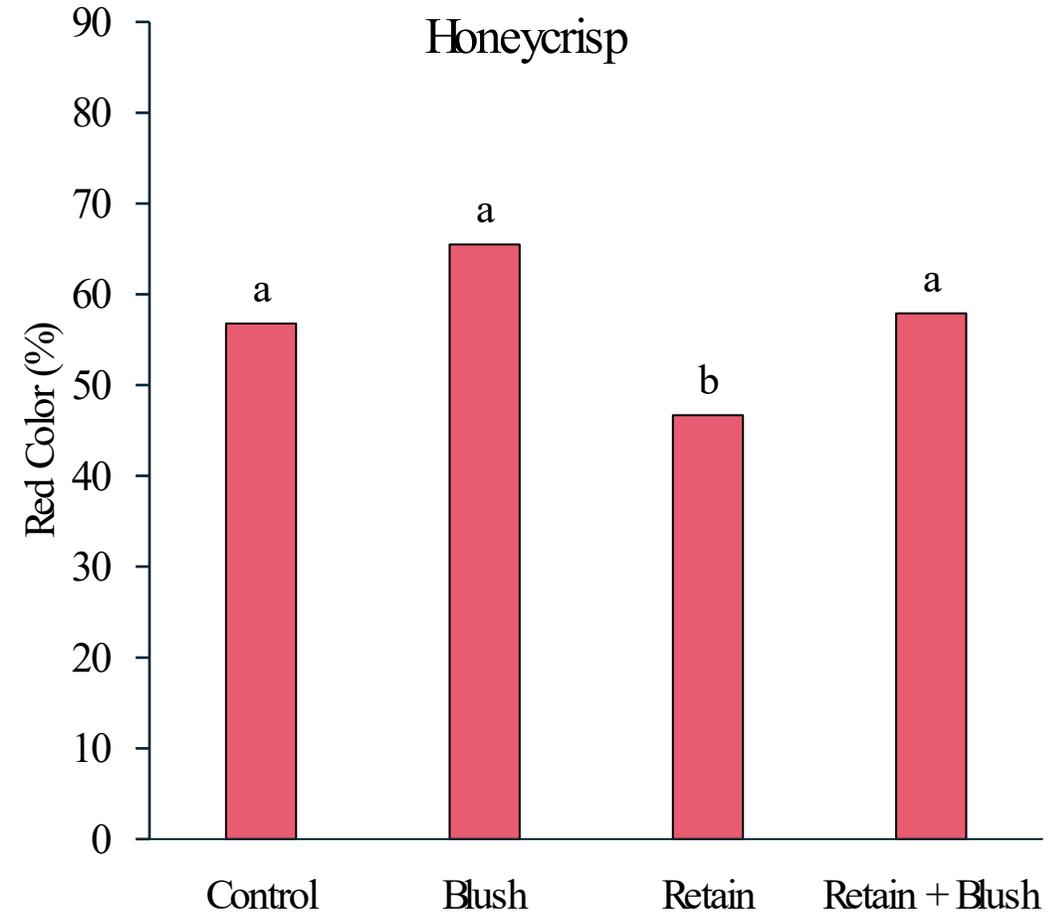
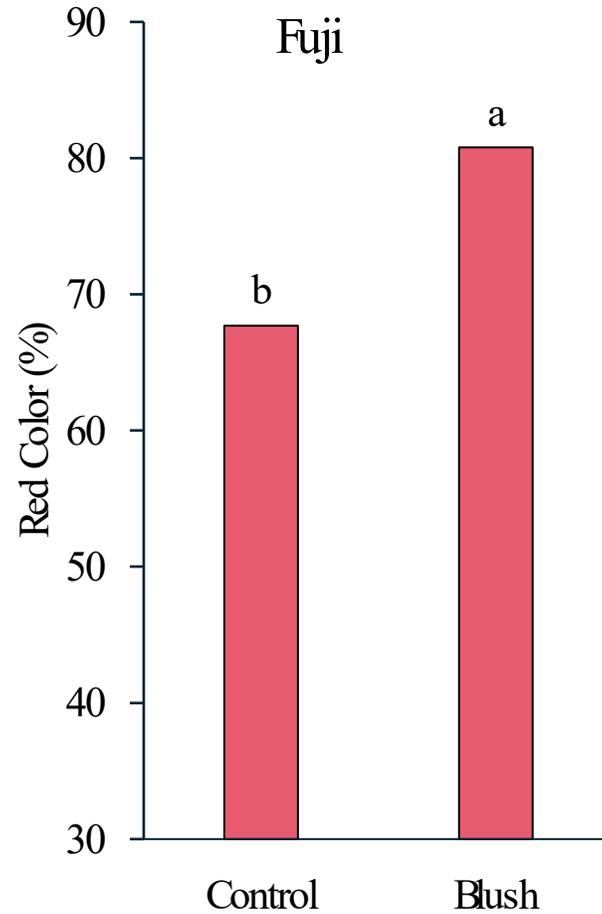
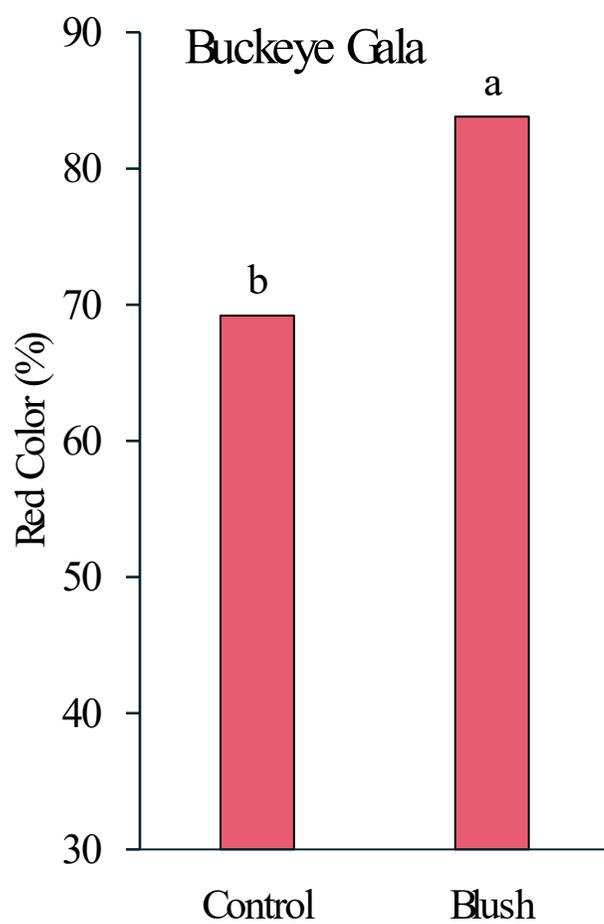




## Summary of Last 3 Years of Research in Robinson Lab

- **Some research will be presented from as far back as 2013**
- **Primarily to improve red color on Honeycrisp**
- **There are some studies to improve red color on Gala**
- **Recommendations for 2026**

# Initial Results: 2013 Blush + Retain

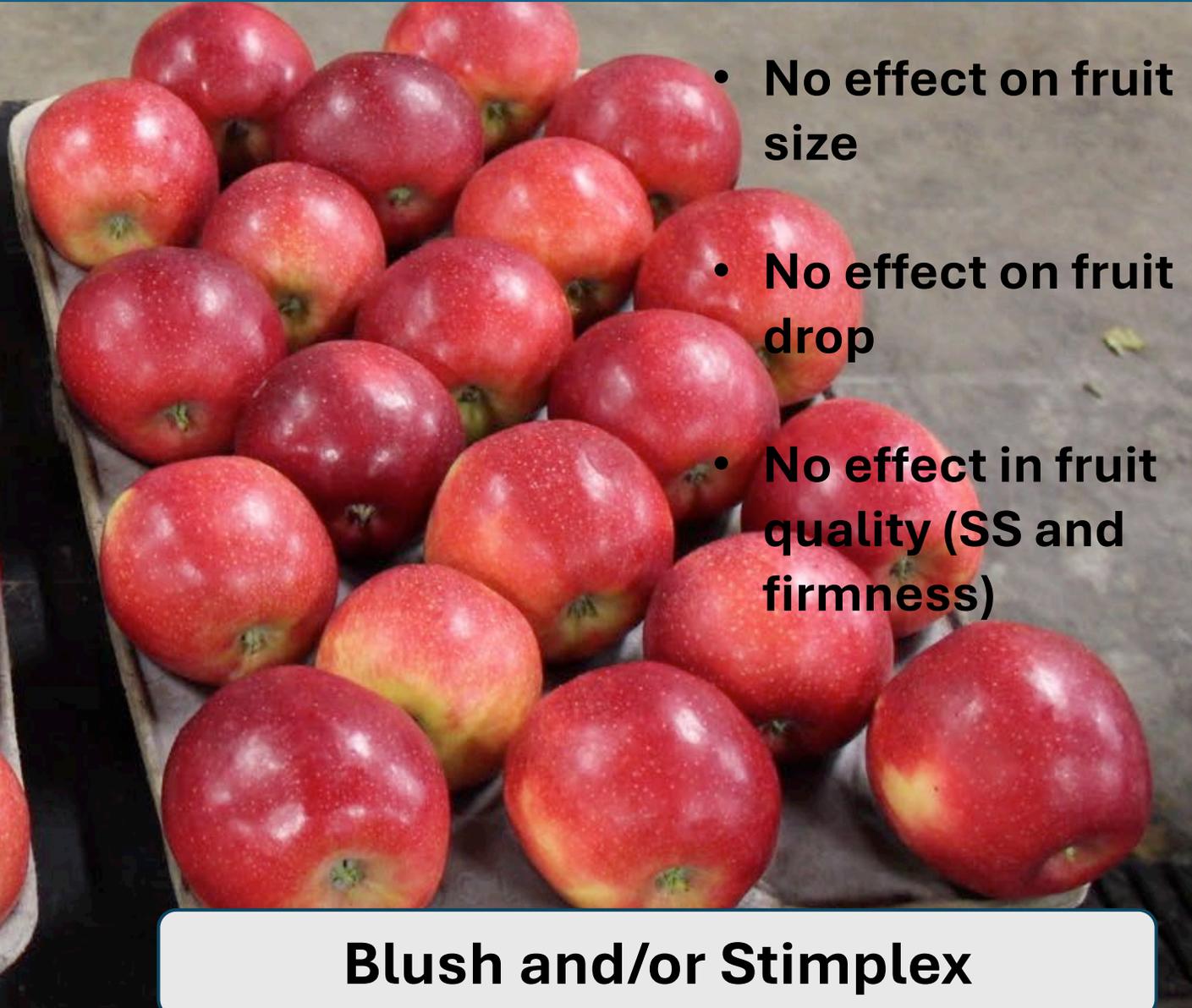


- No differences in fruit quality on HC with Blush. On ReTain, ethylene  and firmness 

# Initial Results: 2015 Jonagold apples in NY



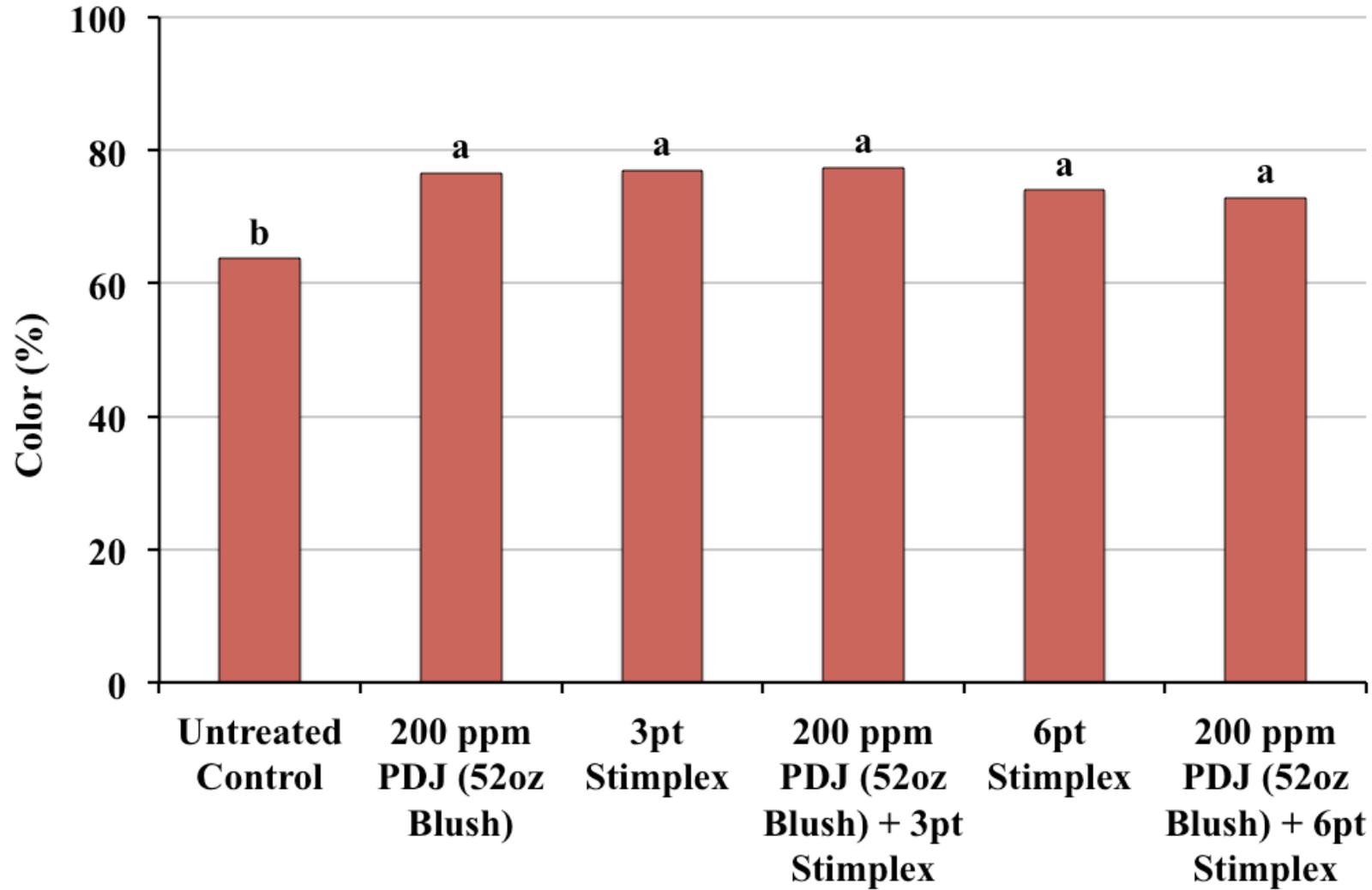
**Untreated control**



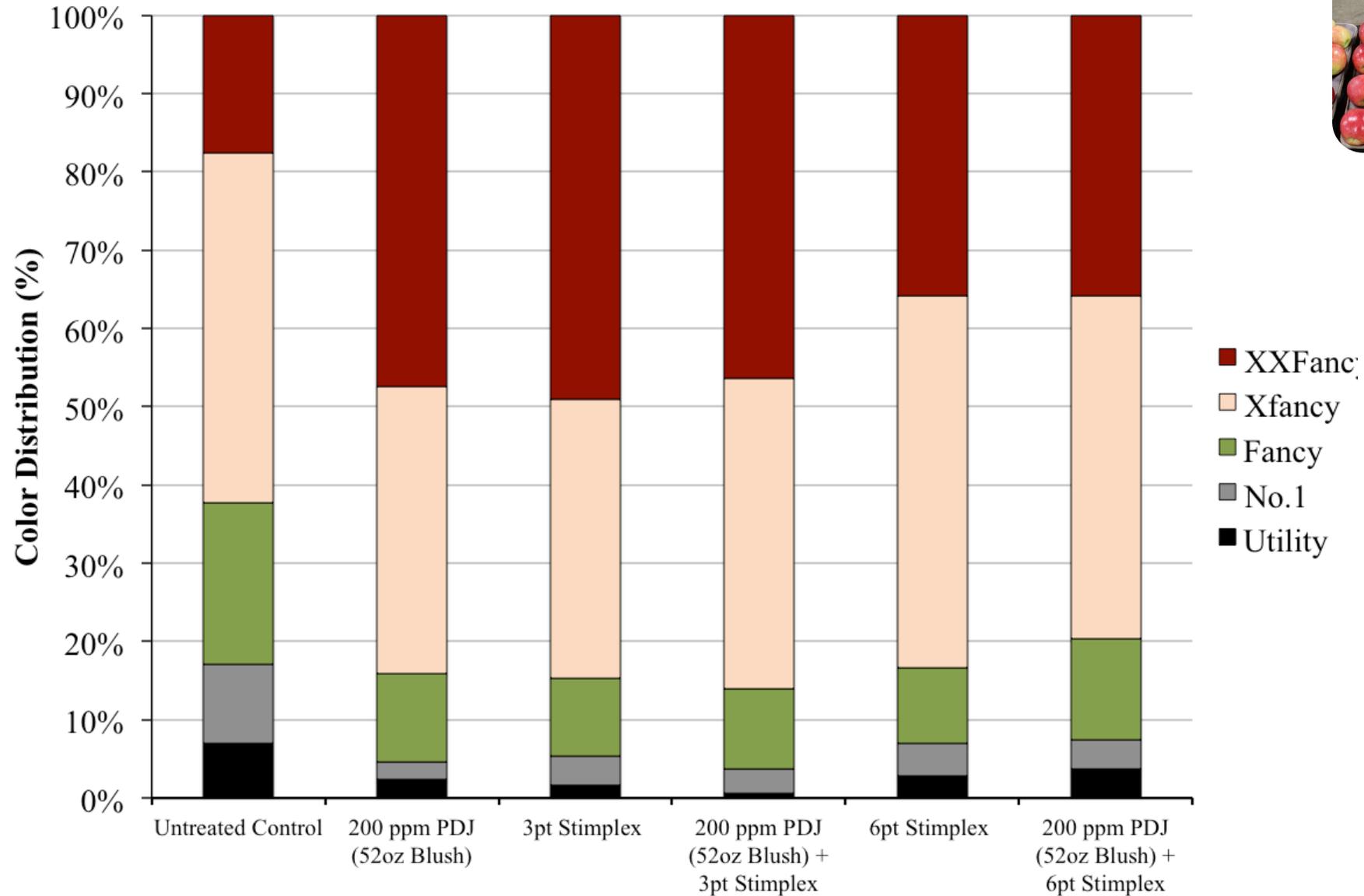
**Blush and/or Stimplex**

- **No effect on fruit size**
- **No effect on fruit drop**
- **No effect in fruit quality (SS and firmness)**

# Initial Results: 2015 Jonagold apples in NY

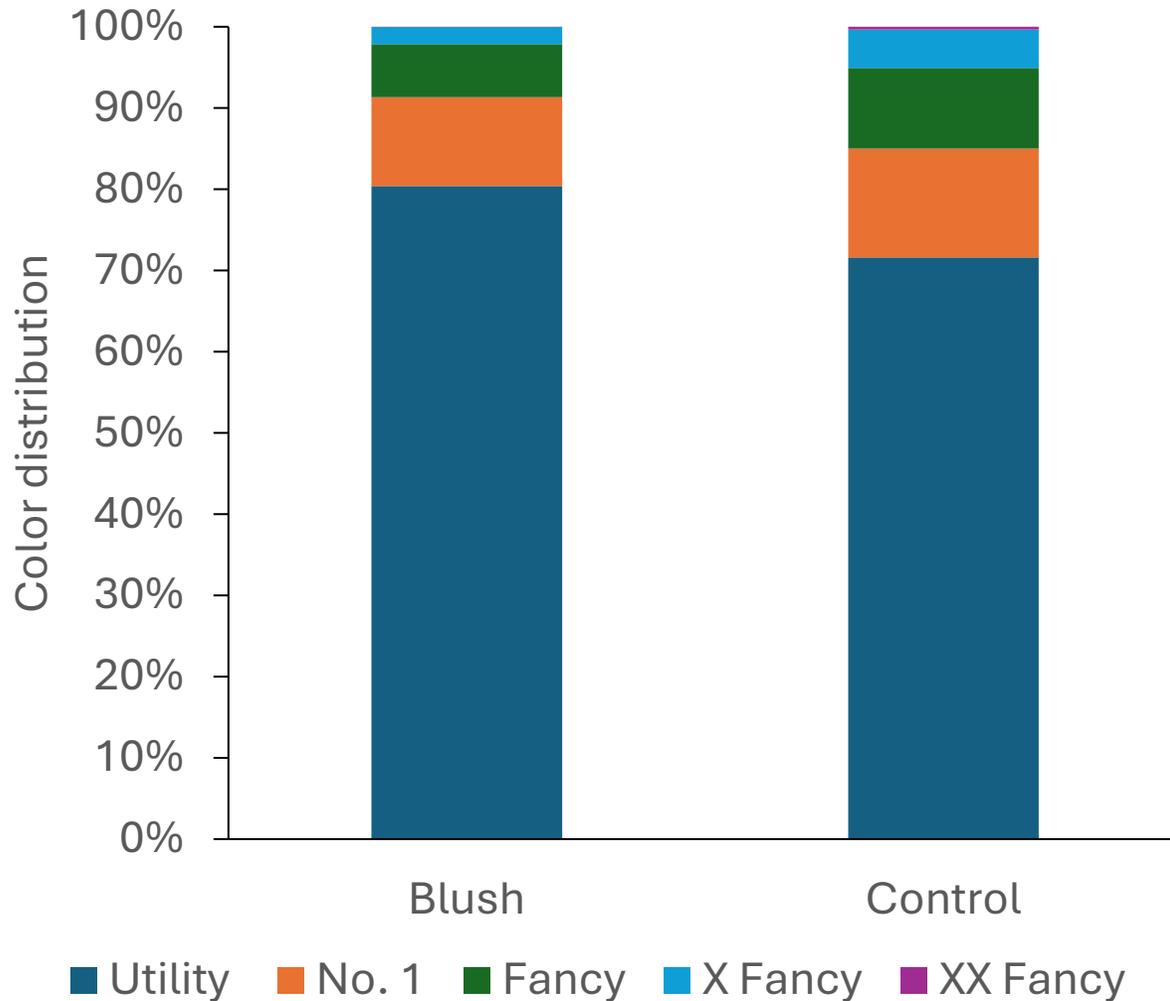


# Initial Results: 2015 Jonagold apples in NY

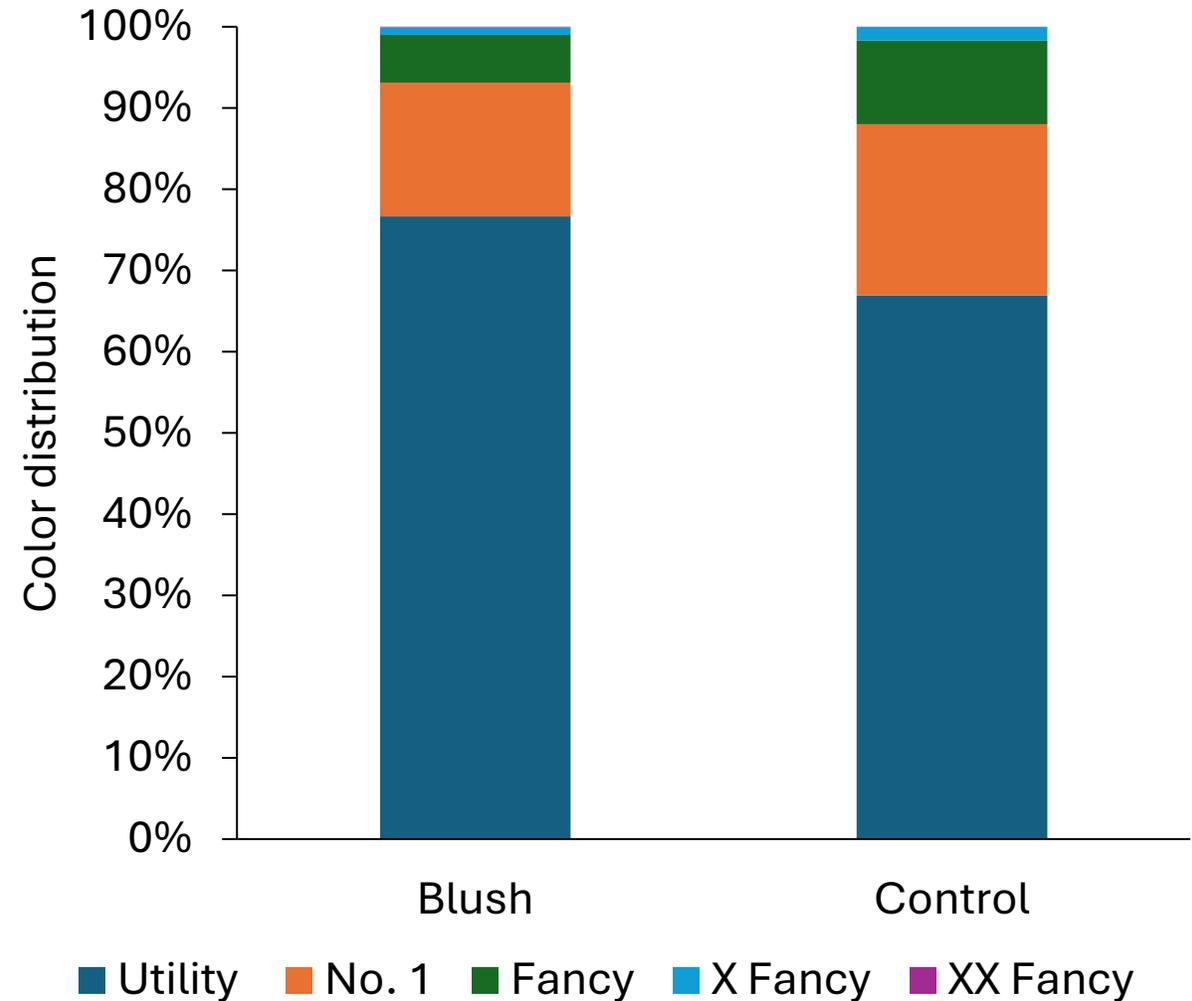


# 2016 Fuji and Gala

## Fuji



## Gala

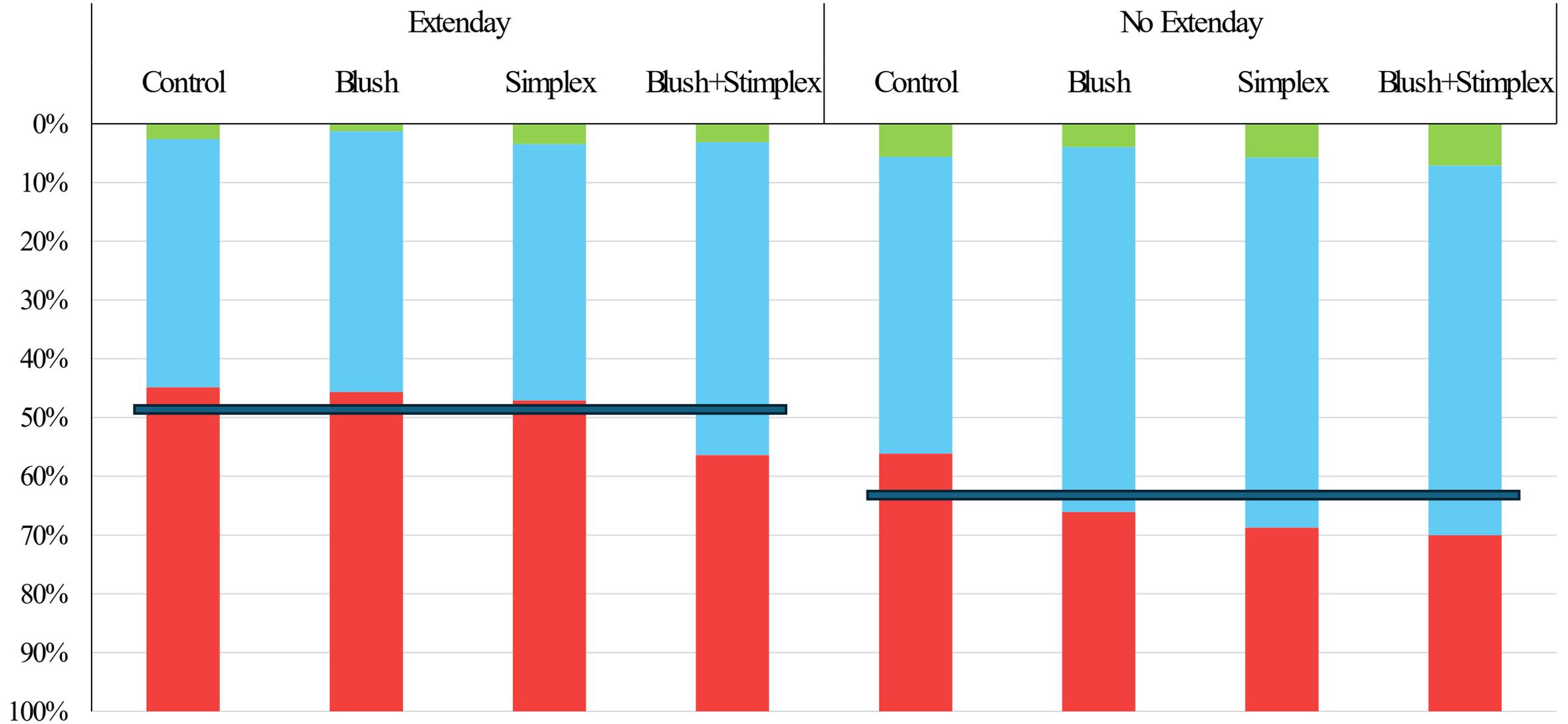


# 2023 - Using Blush<sup>®</sup> and/or Stimplex<sup>®</sup> to improve color

- Two rows of 4-year-old 'Honeycrisp' trees
- Split-plot design with +/- Extenday fabric as the main plot, and spray treatments (Blush and/or Stimplex) as the subplots.
- Total of 5 replications (blocks) with minimum 5 trees per subplot.

Fabric	Treatment	Rate	Timing
No Extenday fabric	Untreated Control	-	1x weekly for 4 weeks prior to harvest
	Blush	240 ppm	
	Stimplex	96 fl oz/acre	
	Blush + Stimplex	240 ppm + 96 fl oz/acre	
Extenday fabric	Untreated Control	-	1x weekly for 4 weeks prior to harvest
	Blush	240 ppm	
	Stimplex	96 fl oz/acre	
	Blush + Stimplex	240 ppm + 96 fl oz/acre	

# Using Blush<sup>®</sup> and/or Stimplex<sup>®</sup> to improve color

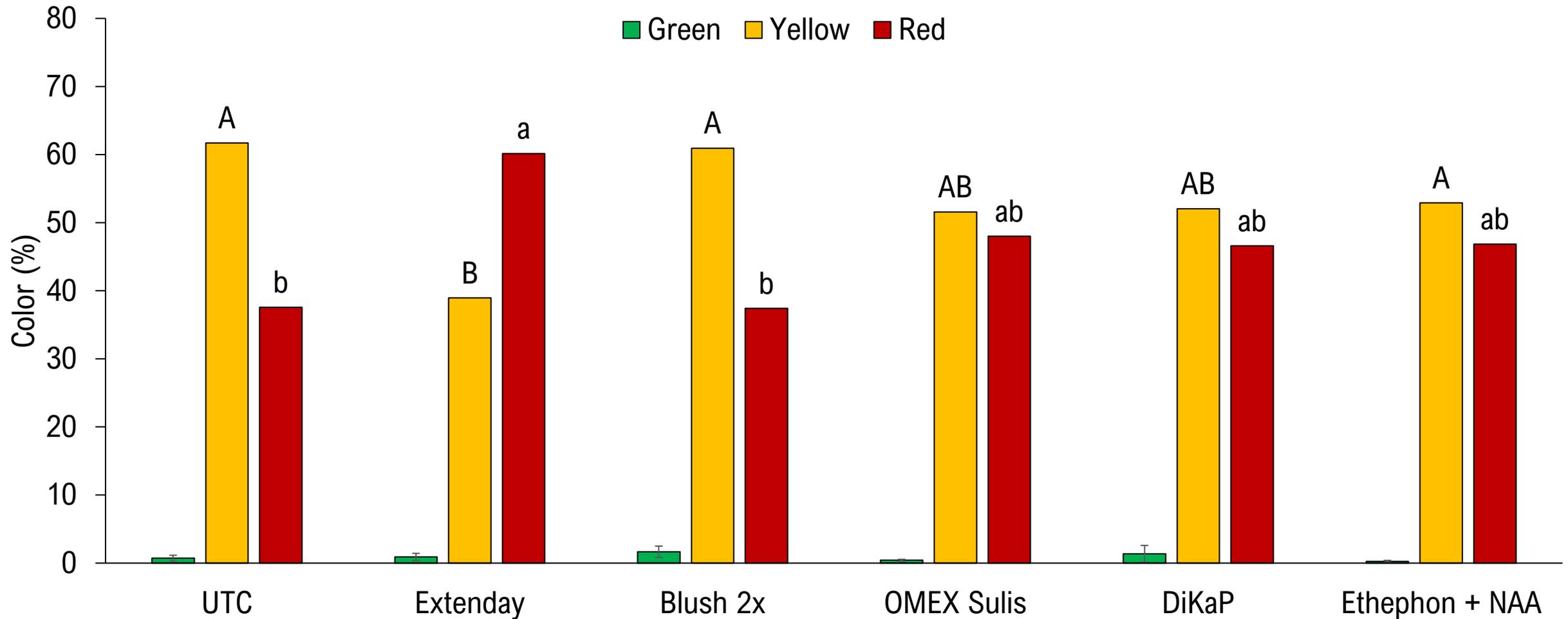


# 2024 Improving color of 'Honeycrisp'

- 2019 'Honeycrisp' on G41

Trt No.	Treatment	Rate	Timing
1	Untreated control	-	-
2	Extenday Fabric	-	4 WBH (Aug. 8)
3	Blush 2x	59 fl oz/ac	3 + 1 WBH (Aug 15 and 29)
4	OMEX Sulis	36 fl oz/ac	3 + 1 WBH (Aug 15 and 29)
5	DiKaP	3 lbs/ac	4 + 2 WBH (Aug 8 and 22)
6	Ethephon 1.5 + NAA Fruitone L	100 ppm + 7.5 ppm	1 WBH (Aug 29)

# 2024 Improving color of 'Honeycrisp'



Only Extenday improved red color from the control

# Improving color of 'Honeycrisp': Retain and Accede

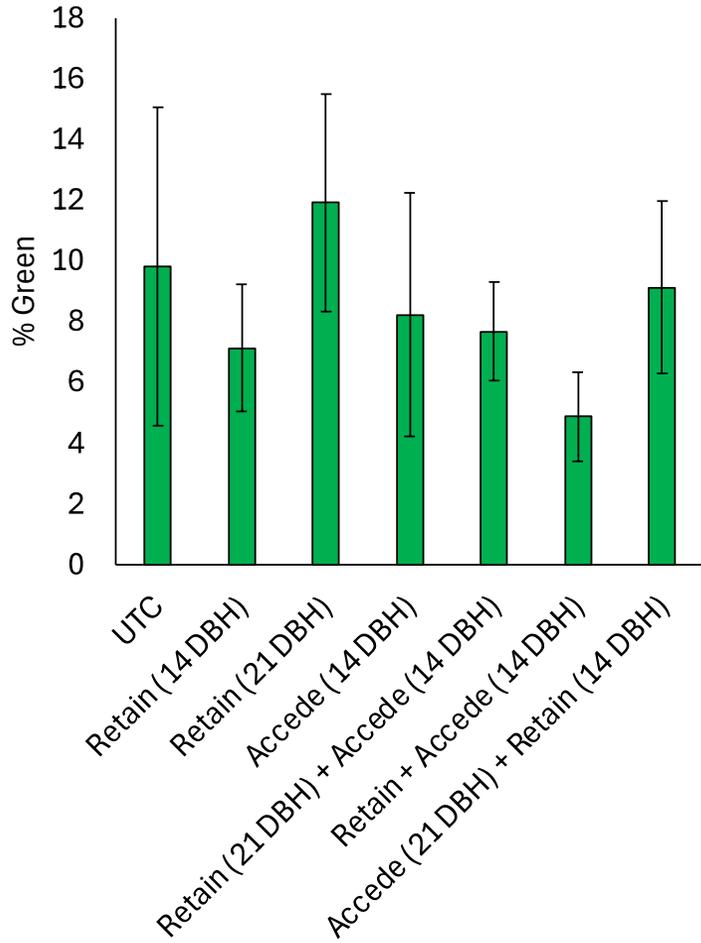


- 2017 'Honeycrisp' on G.41

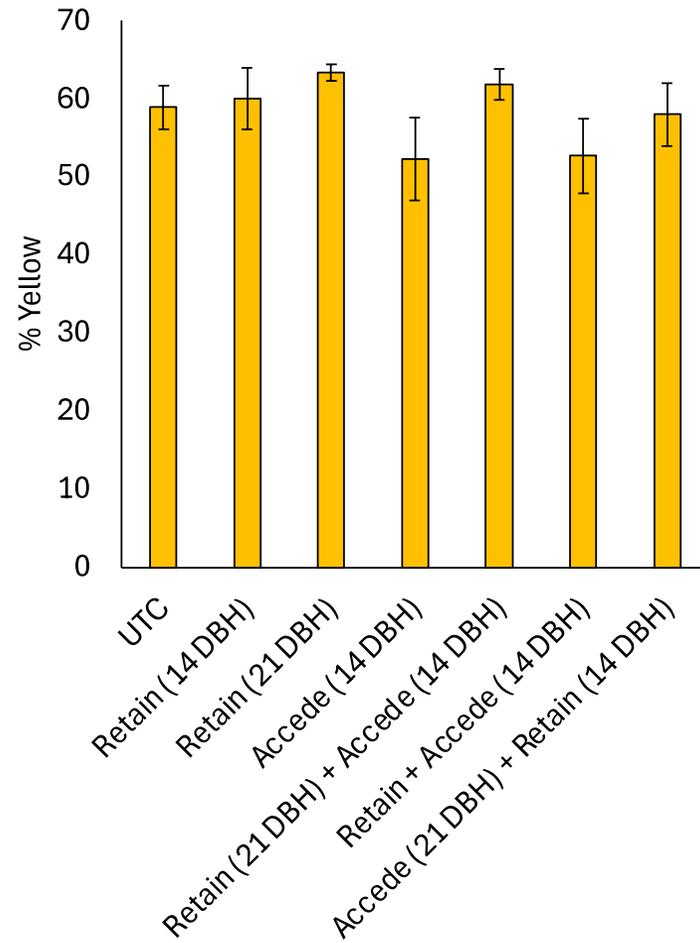
Trt No.	Treatment	21 DBH	14 DBH
1	Untreated control	-	-
2	Retain	-	½ pouch Retain
3	Retain	1 pouch Retain	-
4	Accede	-	200 ppm Accede
5	Retain + Accede	1 pouch Retain	200 ppm Accede
6	Retain + Accede	-	½ pouch Retain + 200 ppm Accede
7	Retain + Accede	200 ppm Accede	½ pouch Retain

# Improving color of 'Honeycrisp': Retain and Accede

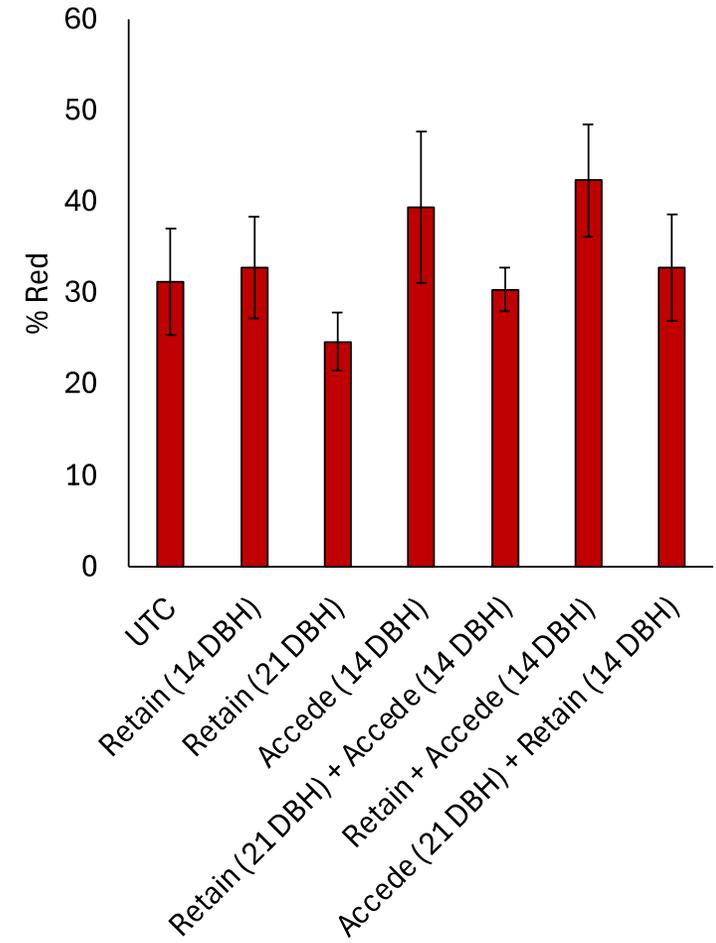
### Green



### Yellow



### Red



No differences between treatments for green, yellow, or red color

# Improving color of 'Honeycrisp': Retain and Accede



## Conclusions:

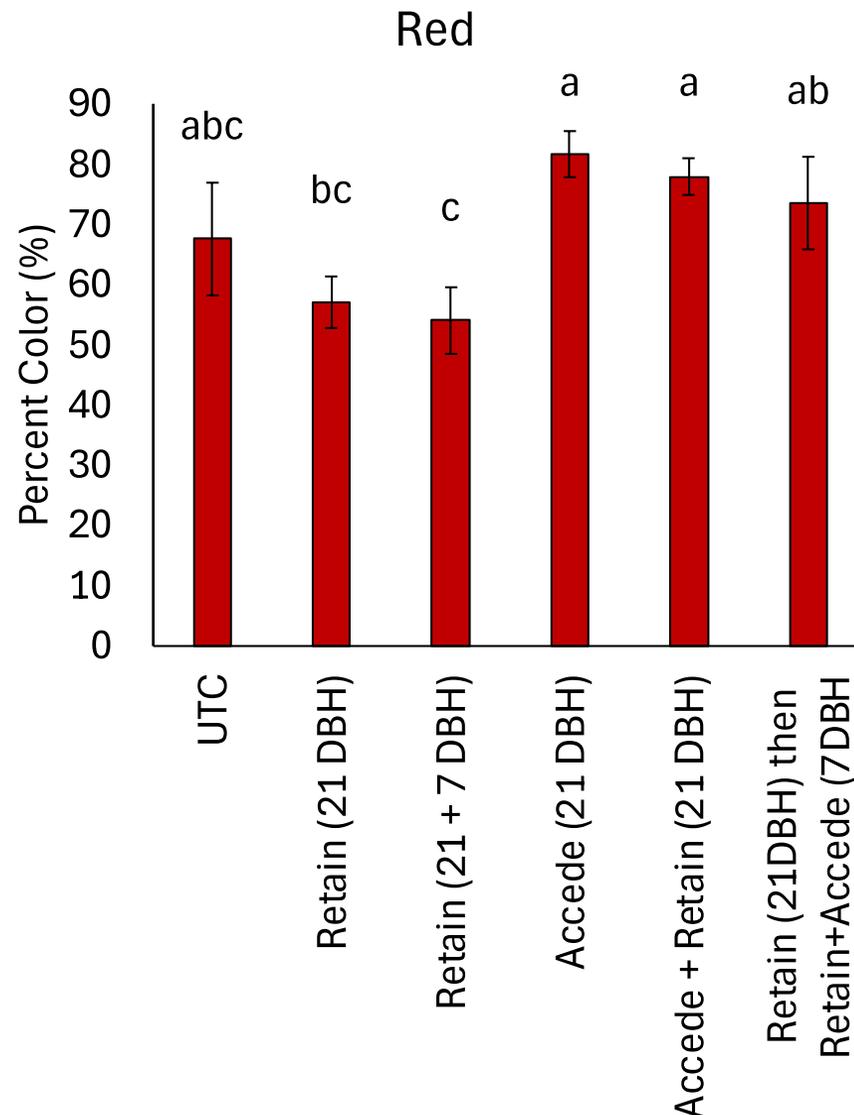
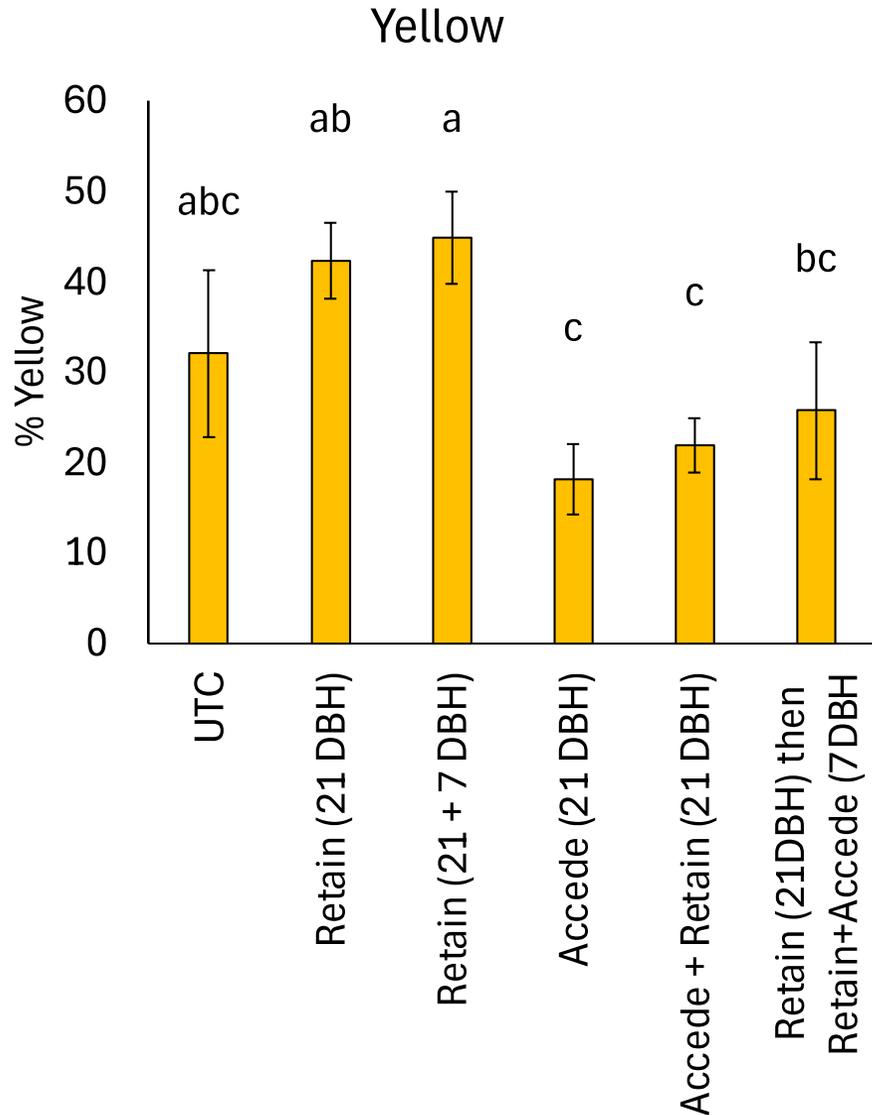
- The 2024 season was 10-14 days earlier than normal
- The ½ pouch of ReTain at 21 DBH delayed red color development but numerically reduced fruit drop
- The later 14 DBH ReTain application did not improve red color or cause higher fruit drop
- Adding Accede to ReTain to prevent fruit drop was a positive result of the study in 2024
- Our results suggest Accede could increase red coloration when added closer to harvest

# Improving color of 'Gala': Retain and Accede

- 2017 'Gala' on G41

Trt No.	Treatment	21 DBH	7 DBH
1	Untreated control	-	-
2	Retain	1 pouch Retain	-
3	Retain	½ pouch Retain	½ pouch Retain
4	Accede	200 ppm Accede	-
5	Retain + Accede	200 ppm Accede + 1 pouch Retain	-
6	Retain + Accede	½ pouch Retain	200 ppm Accede + ½ pouch Retain

# Improving color of 'Gala': Retain and Accede



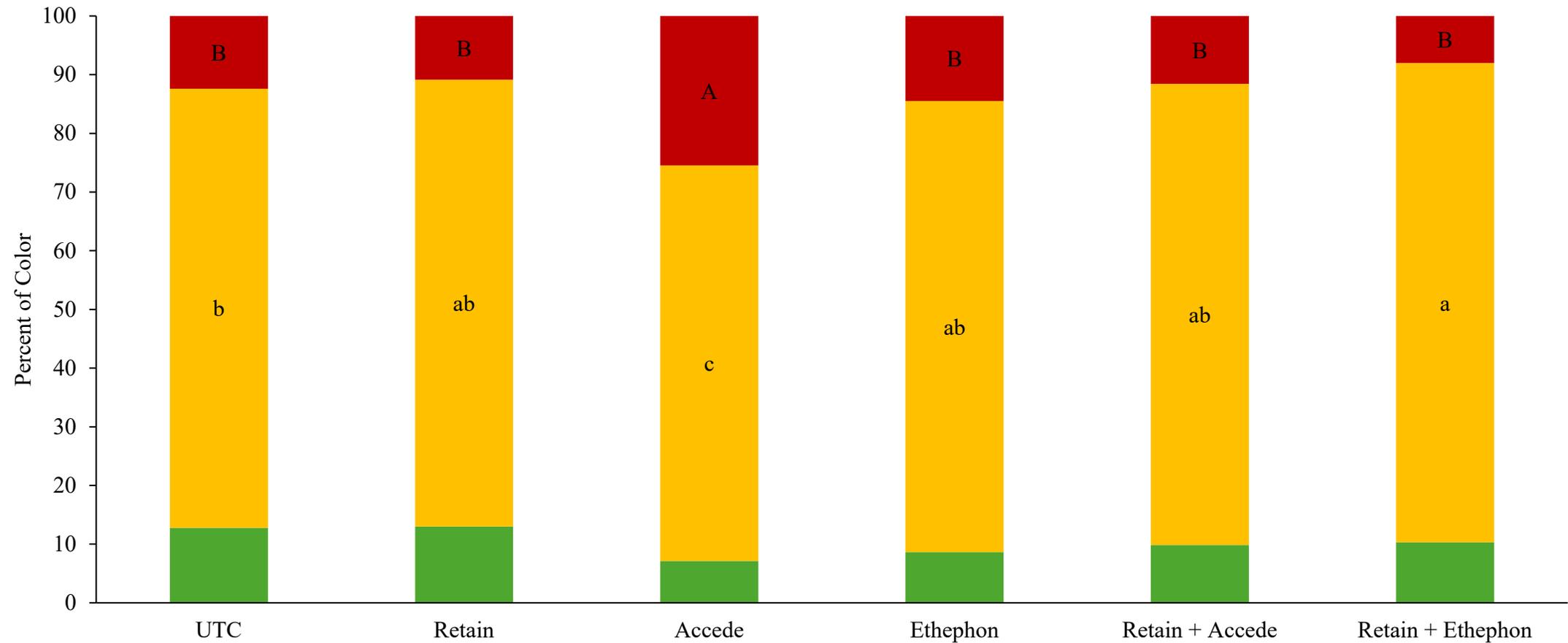
- Retain generally reduced red color
- Accede generally increased red color
- Combining Accede and Retain to improve color but maintain firmness and delay maturity can assist growers when picking multiple varieties which ripen simultaneously in WNY

# 2025 - Using ReTain<sup>®</sup>, Accede<sup>®</sup>, and Ethephon to Improve Color

- Two rows of 4-year-old 'Honeycrisp' trees
- Split-plot design with +/- Extenday fabric as the main plot, and spray treatments (Blush and/or Stimplex) as the subplots.
- Total of 5 replications (blocks) with minimum 5 trees per subplot.

Trt. No.	Trt. Description	Application Timing		
		21 DBH Aug. 18	14 DBH Aug. 25	7 DBH Sep. 2
1	Control	-	-	
2	Retain alone	Retain 1 pouch		
3	Accede alone	Accede 400ppm	Accede 400ppm	Accede 400ppm
4	Ethephon alone	Ethephon 400ppm	Ethephon 400ppm	Ethephon 400ppm
5	Retain + Accede	Retain 1 pouch+ Accede 400ppm	Accede 400ppm	Accede 400ppm
6	Retain + Ethephon	Retain 1 pouch+ Ethephon 400ppm	Ethephon 400ppm	Ethephon 400ppm

# 2025 – Results on Honeycrisp



## 2025 – ‘Ultima’ Gala Study – 2 Objectives

1) To determine the effectiveness of 1 or 2 applications of ReTain to delay by 3 weeks harvest to allow growers to focus on the harvest of Honeycrisp

2) Reducing Internal Browning with ReTain and then Accede to Improve Fruit Color

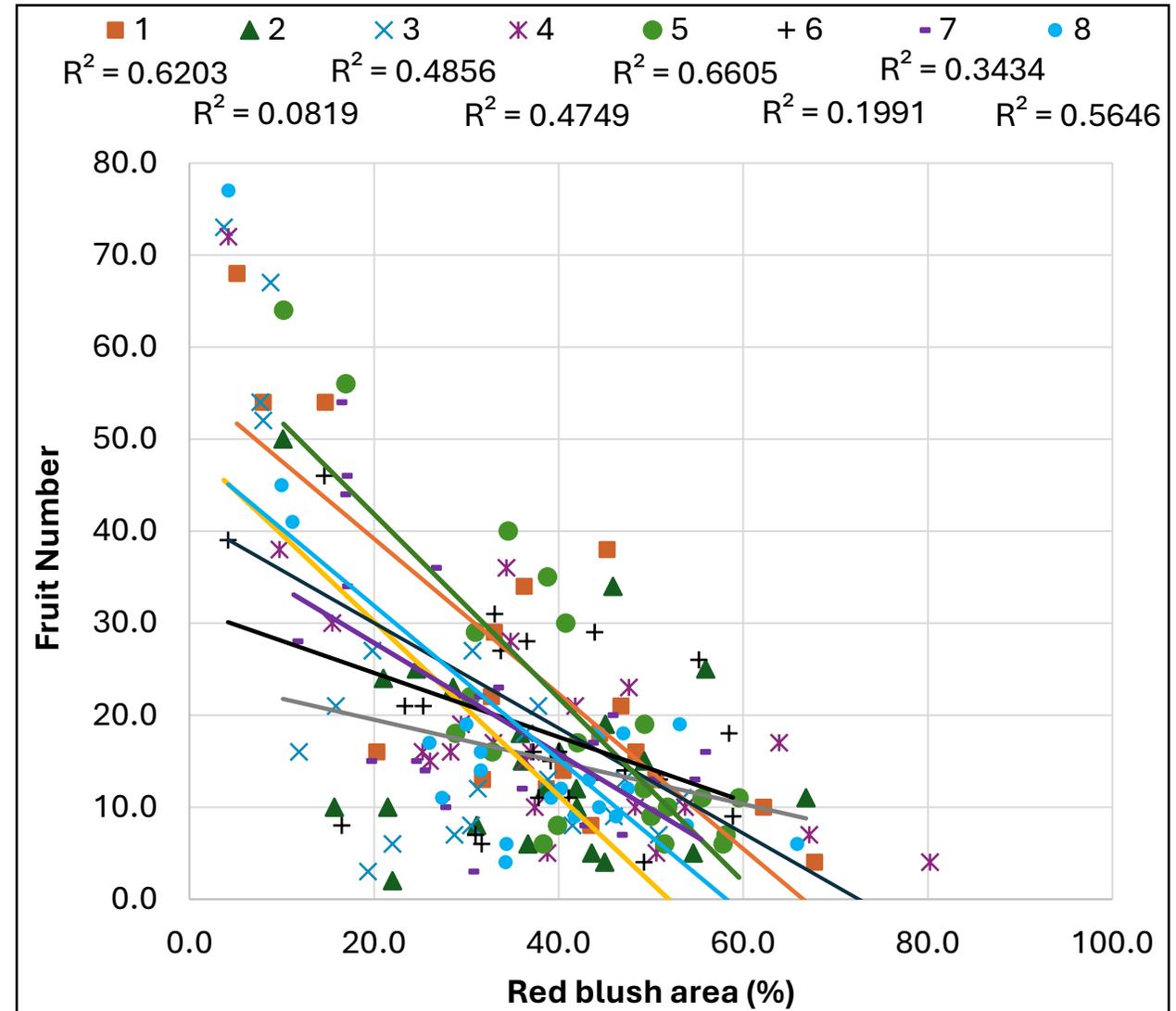
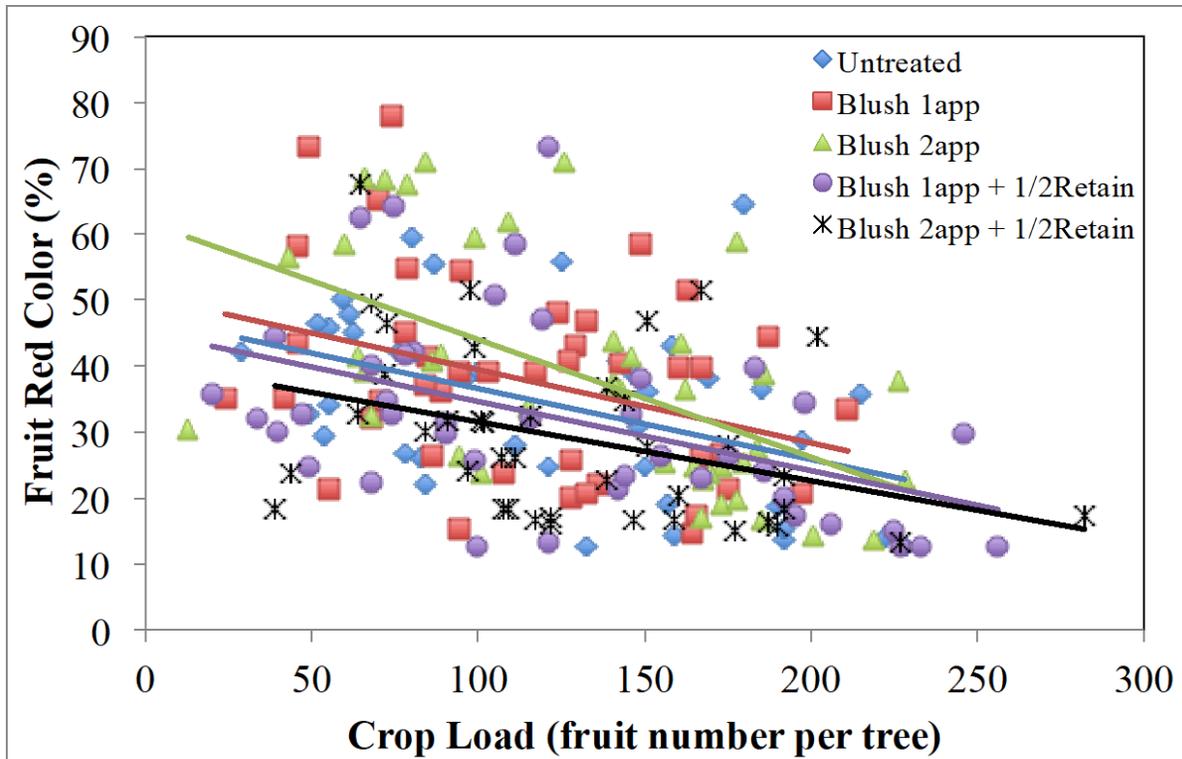
Trt No.	Treatment	Rate	Timing of Sprays
1.	Untreated control	-	-
2.	ReTain+Silwet	½ pouch/acre Retain +1pt/100 gal Silwet	3 wks before expected harvest
3.	Accede	400ppm Accede	0 wks before expected harvest
4.	Retain then, Retain+Silwet+ Accede	½ pouch/acre Retain +1pt/100 gal Silwet ½ pouch/acre Retain +1pt/100 gal Silwet +400ppm Accede	3 wks before expected harvest then 1 day before expected harvest
5.	Retain +Silwet then, Retain+Silwet then Accede	½ pouch/acre Retain +1pt/100 gal Silwet, ½ pouch/acre Retain +1pt/100 gal Silwet + 400 ppm Accede	3 wks before expected harvest then 1 day before expected harvest +1 week after expected harvest

# Results

- For the browning study, fruit are in storage and will be accessed in the spring
- The fruit number harvested was significantly lower and the number of dropped fruit was significantly higher on trees which received two applications of ReTain (3 weeks before normal harvest and on the normal harvest date) plus Accede either tank mixed with the second ReTain spray or applied one week after the second ReTain spray.
- The application of Accede resulted in strong phytotoxicity for all treatments which had Accede, and only the untreated control and ReTain alone trees had minimal phytotoxicity. A comparison of crop load between treatments, which included the dropped fruit number, showed no differences between treatments.



# Regardless of products, crop load matters



# Do we have trends across time?

TREATMENT	2013	2015	2016	2021	2022	2023	2024	2025
Blush	Yes*	Yes	No*			No	No	
Stimplex		Yes				No		
Blush + Stimplex		Yes				No		
Retain	No*						No	No
Blush + Retain	Yes*	No						
Accede					No		Yes?	Yes
Accede + Retain					No		Yes?	No
Mylar					No*	Yes		
Extenday				Yes	Yes	No	Yes	Yes

# Terence's Overall Conclusions

- Sometimes Blush works and sometimes it doesn't.
- Sometimes ReTain+Accede works and sometimes it doesn't.
- Reflective film works all the time.
- Future research - a more systematic study of Blush timing and dose and more systematic study of ReTain+Accede timing and dose.
- With both products, excessive crop load can negate their effectiveness.

# QUESTIONS?

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- [lof.cce.cornell.edu/](http://lof.cce.cornell.edu/)
- [www.youtube.com/  
@LakeOntarioFruitProgram](https://www.youtube.com/@LakeOntarioFruitProgram)



**THANKS!**