Rootstock Scion Combination Observations
Mid Atlantic Tree Fruit Program
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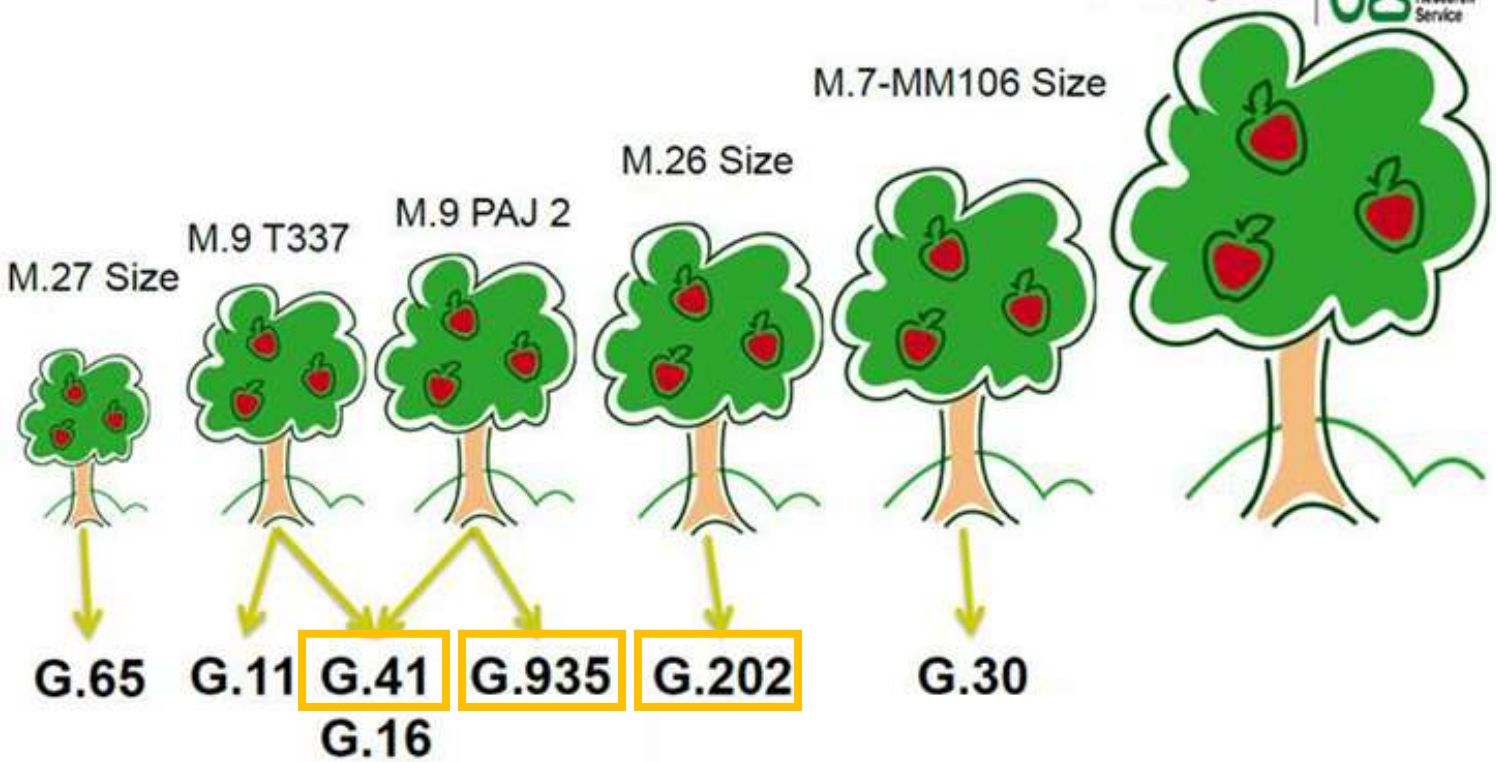
High density orchard recommendations

Region	System
New York, Robinson 2013 http://www.nyshs.org/pdf/-NYFQ%202012.CMC/-NYFQ%20WINTER%202012.CMC/1.Experiences%20with%20Support%20Systems%20for%20the%20Tall%20Spindle%20Apple%20Planting%20System.pdf	3 x 10’ (1,452 trees/A) Tall spindle
Washington State, Musacchi 2014 http://jenny.tfrec.wsu.edu/wsha2014/Precision_Horticulture/MusacchiPrecisionMechanization.pdf	3 x 10’ Multi leader, V axis
North Carolina, Parker 1998 http://content.ces.ncsu.edu/high-density-apple-orchard-management	4-8 x 12-16’ (450-600 trees/A) Tall Spindle

Considerations:
tree vigor, orchard management, cost of establishment, rootstock availability, mechanization

Mid-Atlantic:
What are the recommendations for high density plantings?
Which rootstocks are appropriate?

Released GENEVA® Apple Rootstocks Arranged by Tree Size



G.202	Resistant to Fire Blight and Wooly Apple Aphid
G.202TC	Tissue Culture
G.41	Dwarfing rootstock, Resistant to Fire Blight and Crown Rot
G.935	Dwarfing rootstock, Resistant to Fire Blight and Crown Rot

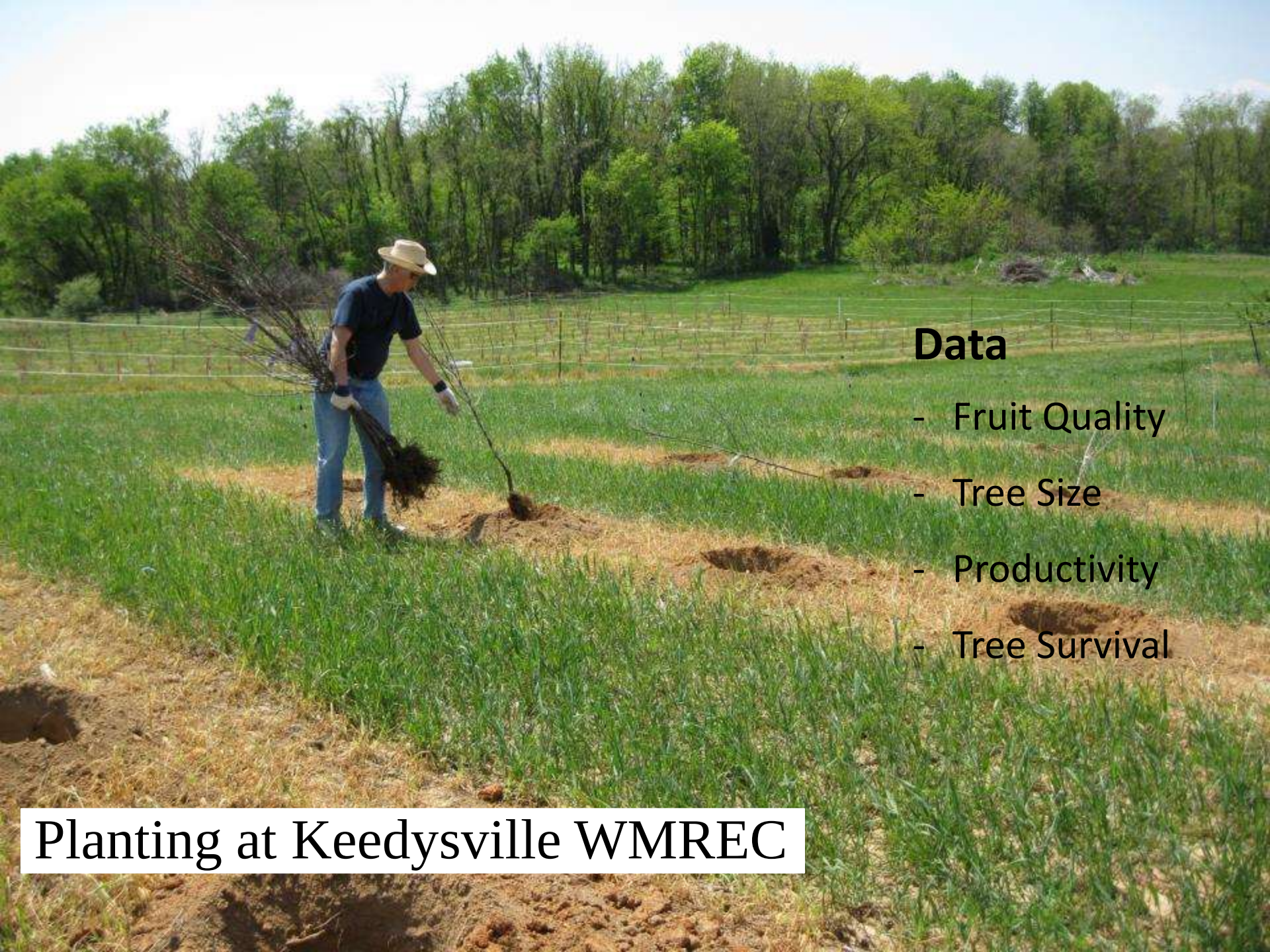
Scion
Cripps Pink
Brooksfield Gala

http://cornell.flintbox.com/public/project/21526

Keedysville Trials

- High Density system for western MD
- Rootstock evaluation
- Comparison of propagation methods
  tissue culture (TC) vs stoolbed (SB)

- Set in April 2010 (Latin Square)
- Trained to tall-spindle system: 6x12’
- 7 trees per panel
- Irrigated
- Trellis is 4 wire top wire 9’ 6”



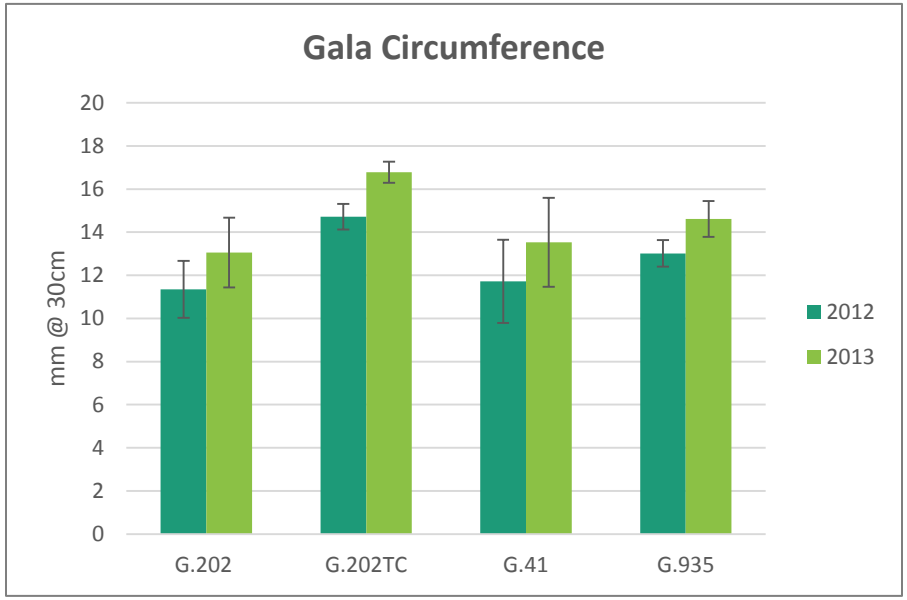
Data

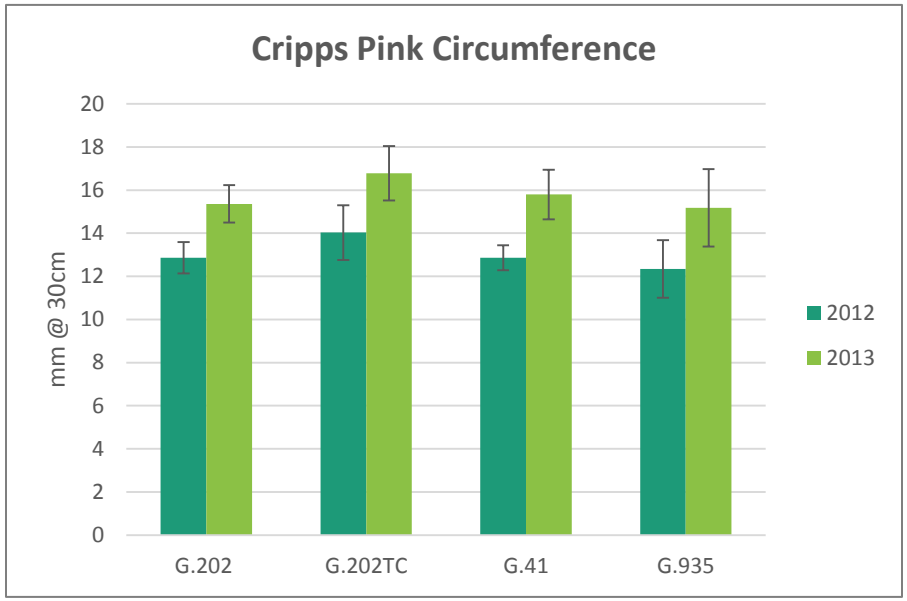
- Fruit Quality
- Tree Size
- Productivity
- Tree Survival

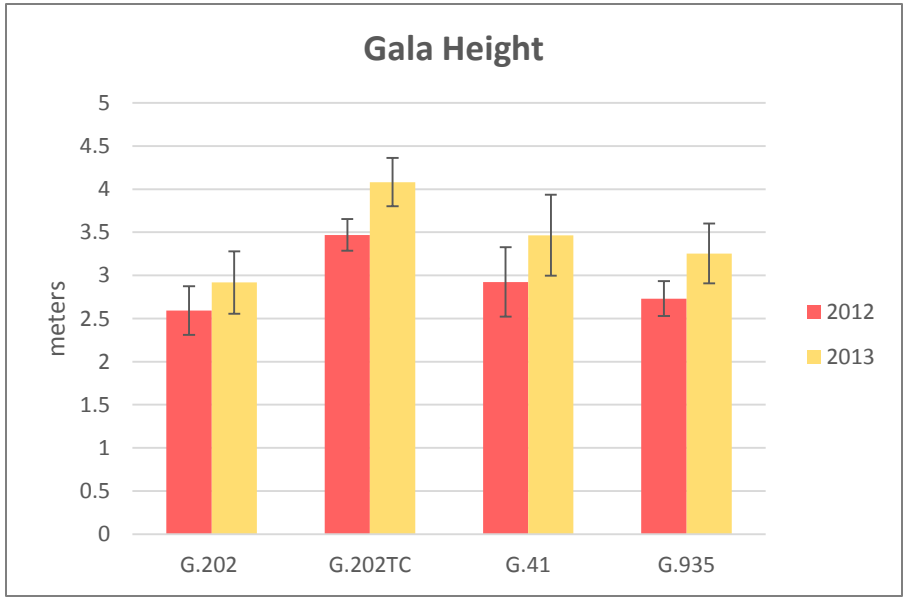
Planting at Keedysville WMREC

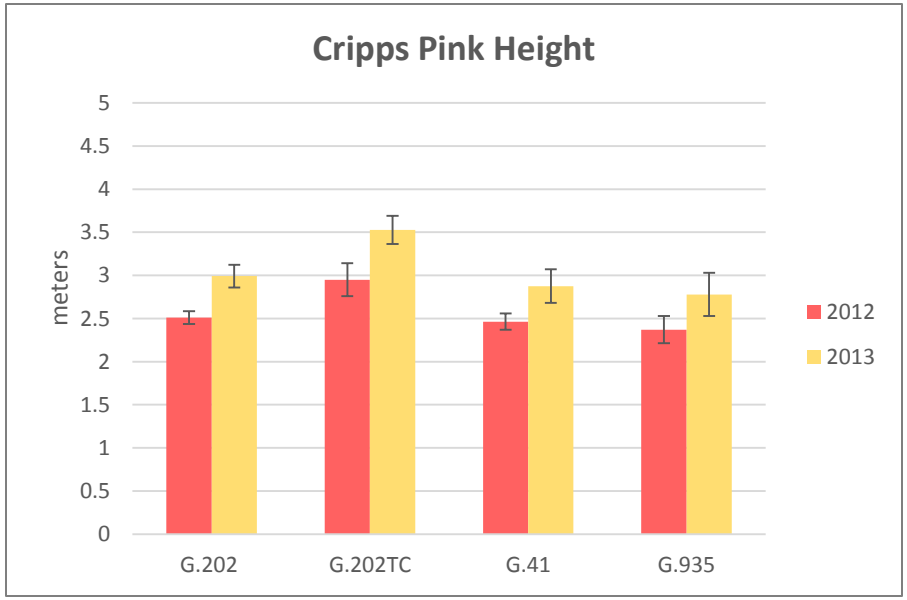
What have we observed

Tree Size 2012 & 13 Height & Diameter









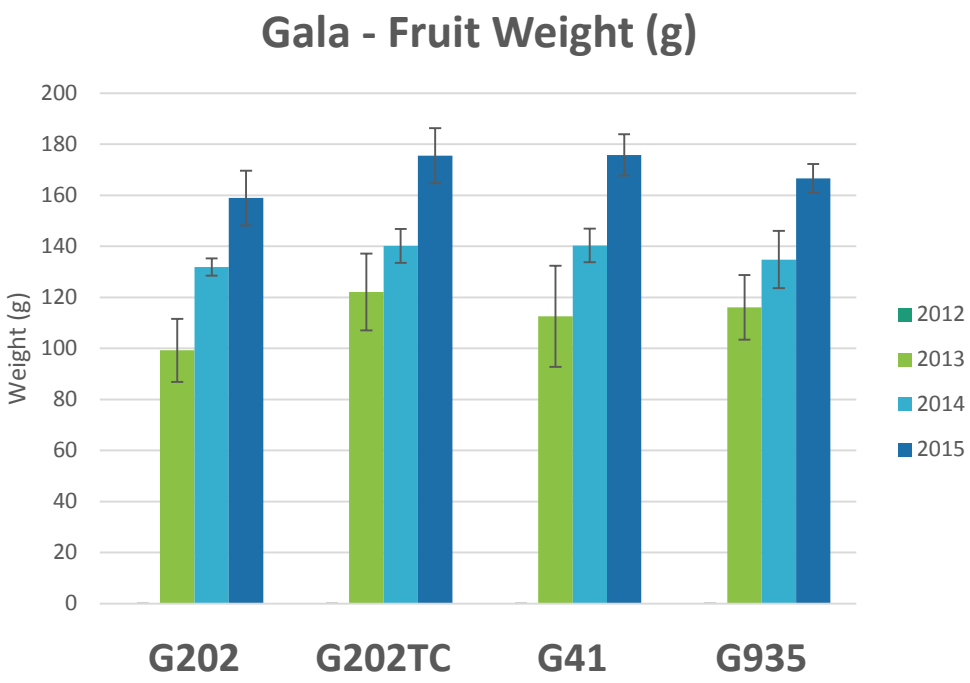
Fruit Quality

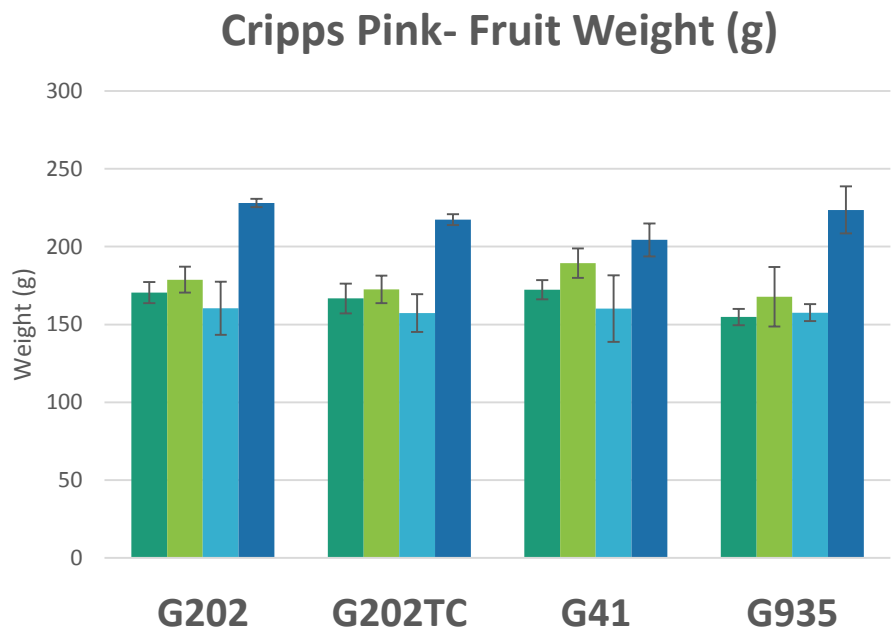
No significant differences

Between rootstocks

- Color
- Soluble solids (^{o}Brix)
- Firmness (kg)
- Starch content

Fruit Size





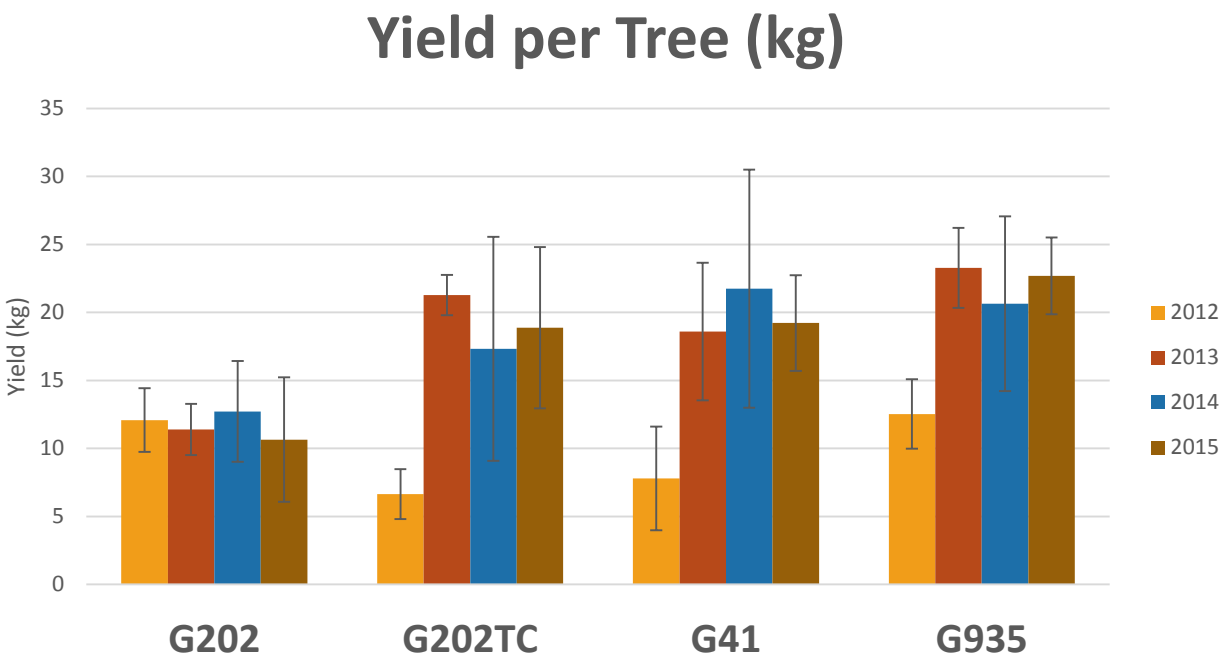
Gala

G.202 fruit smaller than G.202TC & G.41 stock

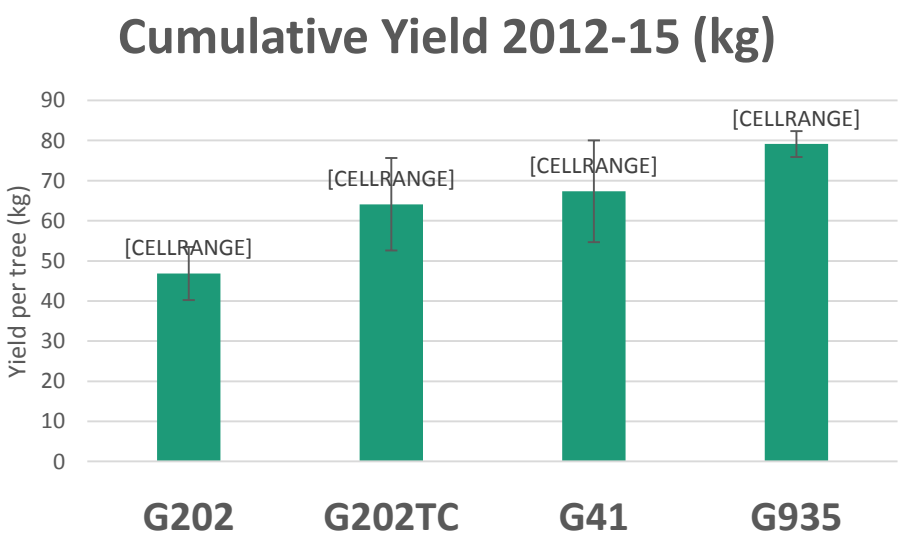
Cripps Pink

Not significantly different by root

Gala Yield

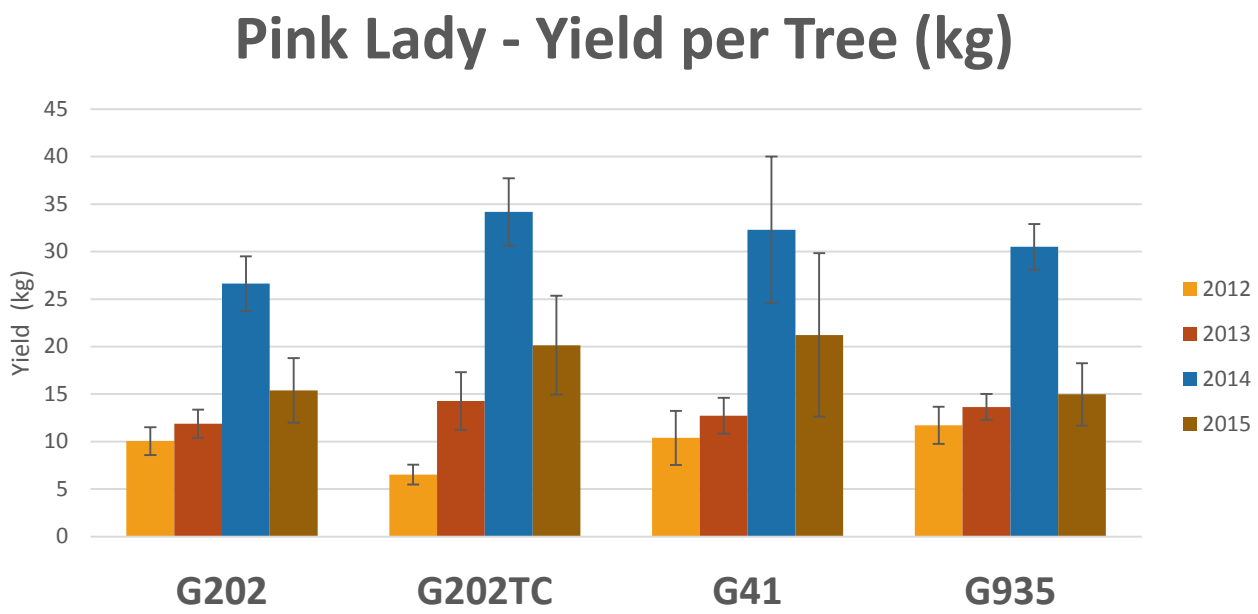


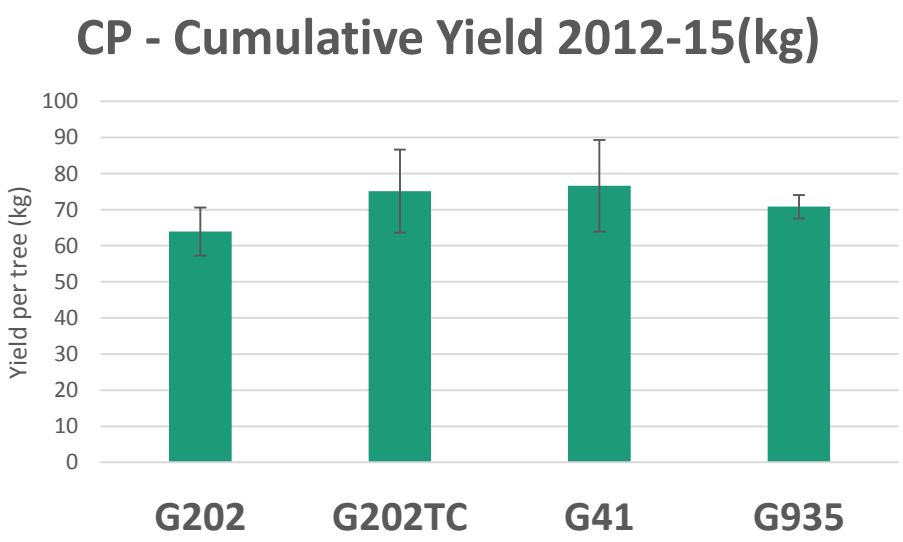
G.202 – significantly lower yields each year 2013-2015



G.202 – Significantly lower cumulative yields

Cripps Pink Yield





No significant differences in Yield between rootstocks

2014 2pt. Sevin
2015 2pt. Sevin + 64 oz. Maxcel

Tree Survival

Storm Damage July 2011

Brookfield Gala					Cripps Pink			
								X
								X
								X
								X
X	X							
					X			
					X			
					X			
					X			
							X	
							X	
								X
						X		X
						X		X
			X					
			X		X		X	
					X			
								X
					X		X	
					X		X	

Key	
	202TC
	935
	202
	41

G.41 Cripps Pink

Gala

(not significant)

- G.202TC (3)
- G.935 (1)

Cripps Pink

- G.202 and G.202TC nearly 100% survival
- G.41 (13)
- G.935 (9)

4/25 bloom
5/4 bloom
storms/wind
30 mph
5/8
6/9 high
Wind 40 mph/hail

Observations

Daybreak Fuji on M 9 337 planted 2012

A few thoughts

- **TC** trees are big
- **Fruit Quality** not significantly different between rootstocks 2012-2015
- **Gala on G.202:** significantly smaller fruit and lower yields (annual and cumulative)but trees hold up
- **Cripps Pink Tree Losses:** Significantly higher tree losses for G.41 and G.935 than G.202 and G.202TC
  - All graft union breaks in severe wind

Continued

- **Graft union strength** may be variety specific
- **High Density Systems:** Management may prove to be a challenge in the Mid-Atlantic

❖ **Continue Regional Field Testing:** Tailor scion/rootstock selection & management to region

❖ **Project to dissect graft unions** : learn exactly what the default is how soon it shows up

❖ **Develop a "fast" diagnostic tool determine the likelihood of incompatibility**

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Thank you

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