LOF Virtual Spring Bloom Meeting

Craig Kahlke, Team Leader, CCE Lake Ontario Fruit Program

May 21st, 2020

- Presentation by Dr. Terence Robinson, Cornell University
- Mario Miranda Sazo, CCE-LOF
- Q & A

Cornell Cooperative Extension | Lake Ontario Fruit Program

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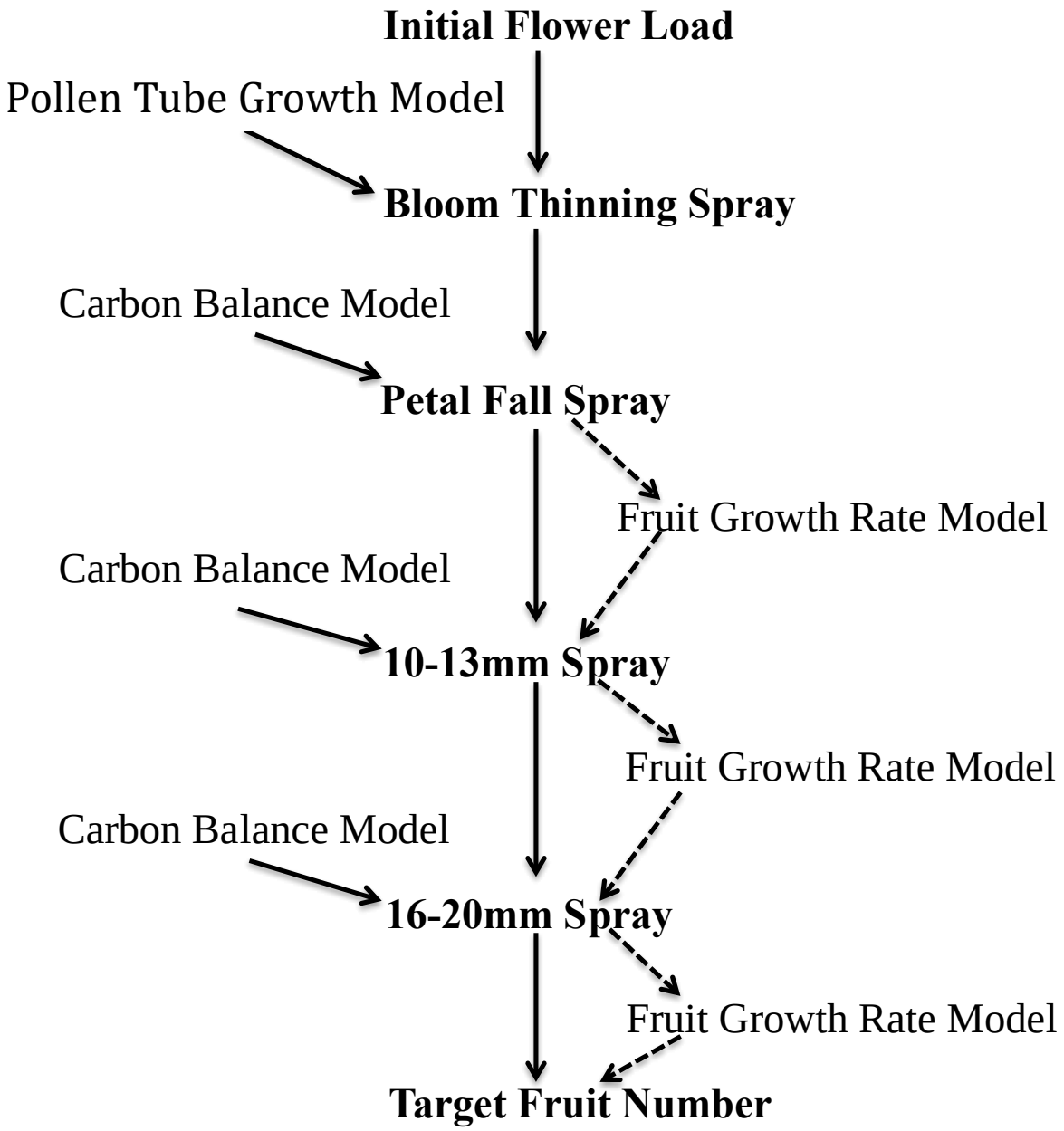
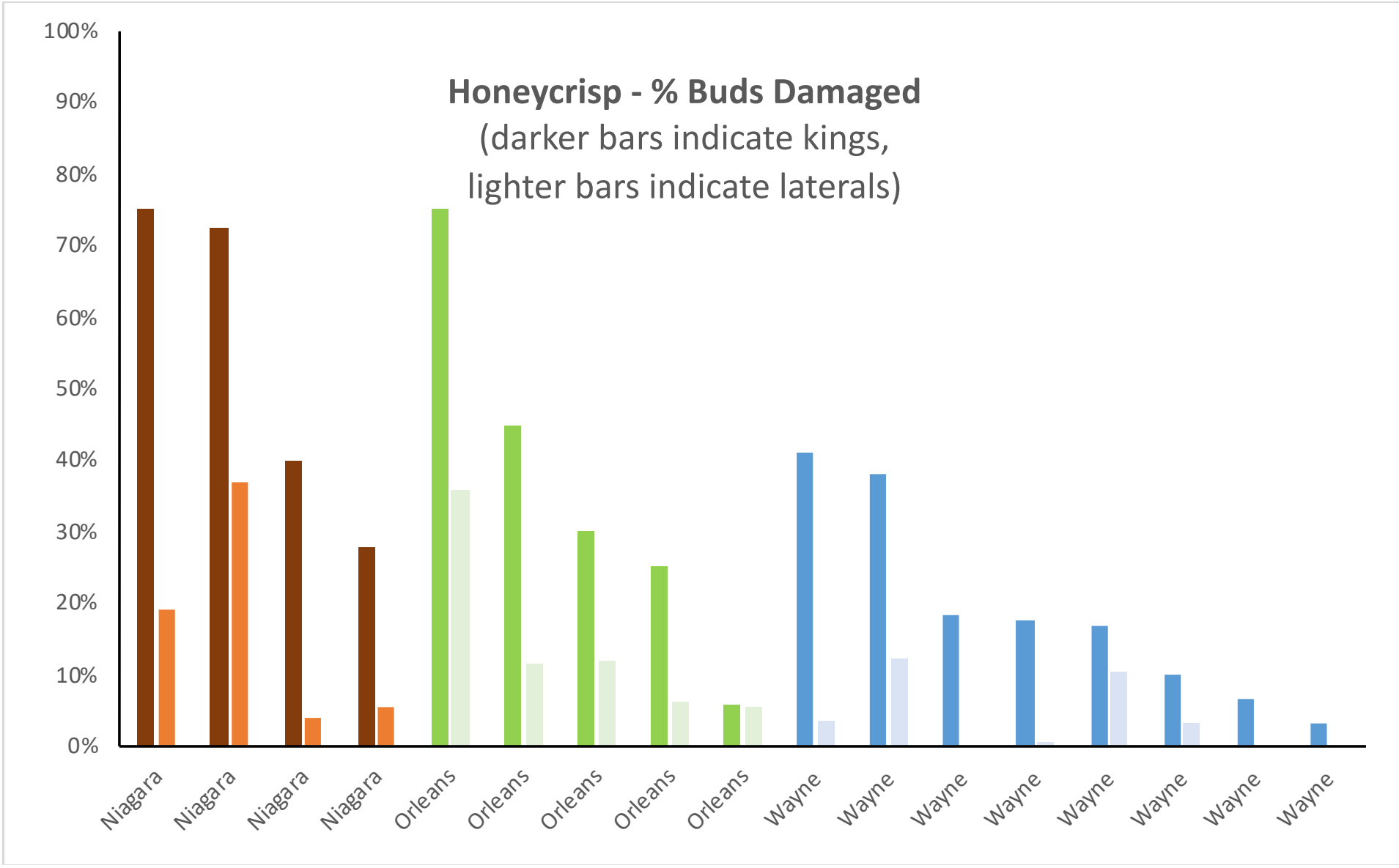
Steps in Precision Chemical Thinning



Bloom Thinning in 2020

- Repeated frosts damaged kings flowers which makes bloom thinning risky.


Honeycrisp - % Buds Damaged
(darker bars indicate kings,
lighter bars indicate laterals)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Niagara
Niagara
Niagara
Niagara
Orleans
Orleans
Orleans
Orleans
Orleans
Wayne
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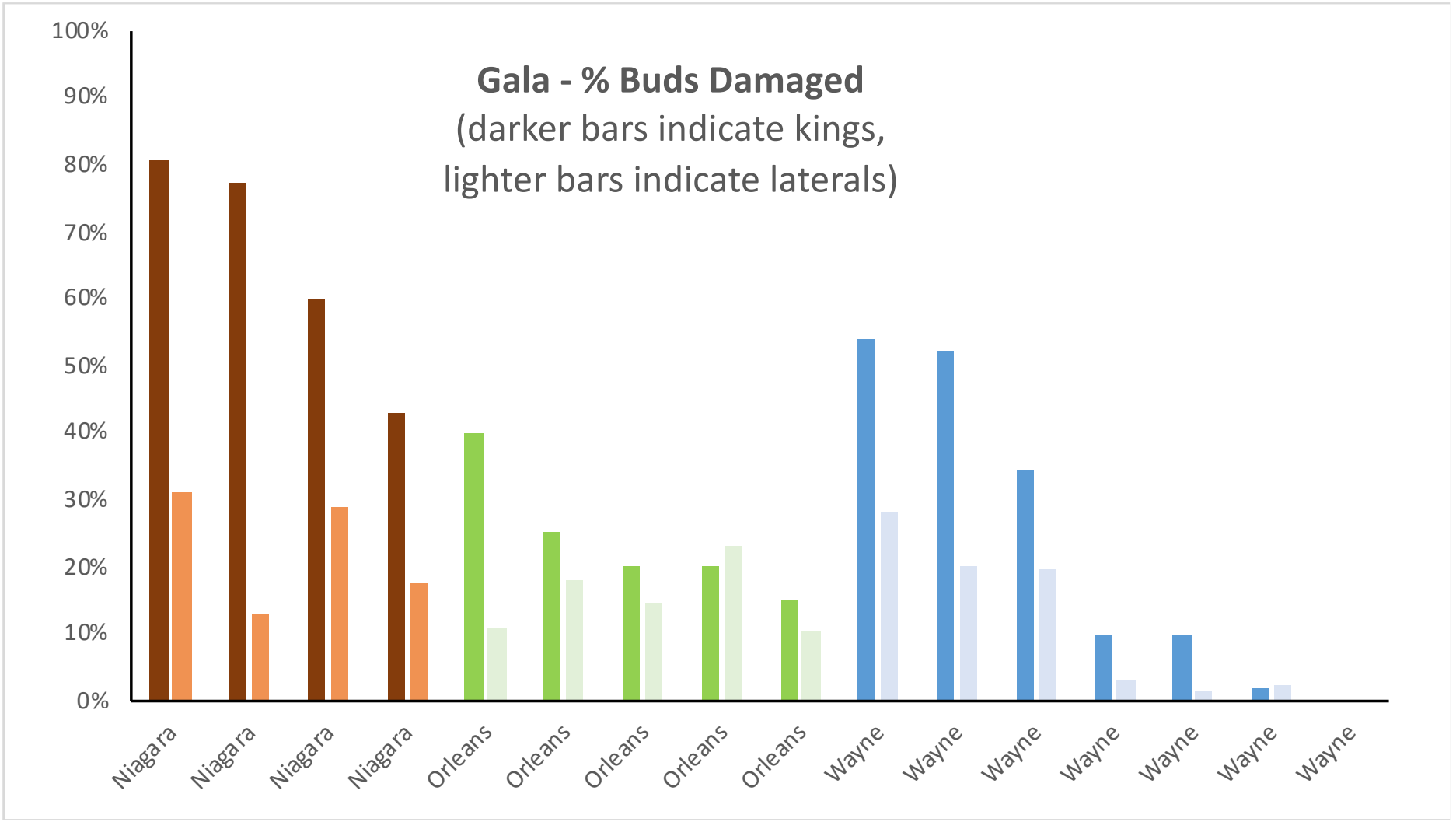
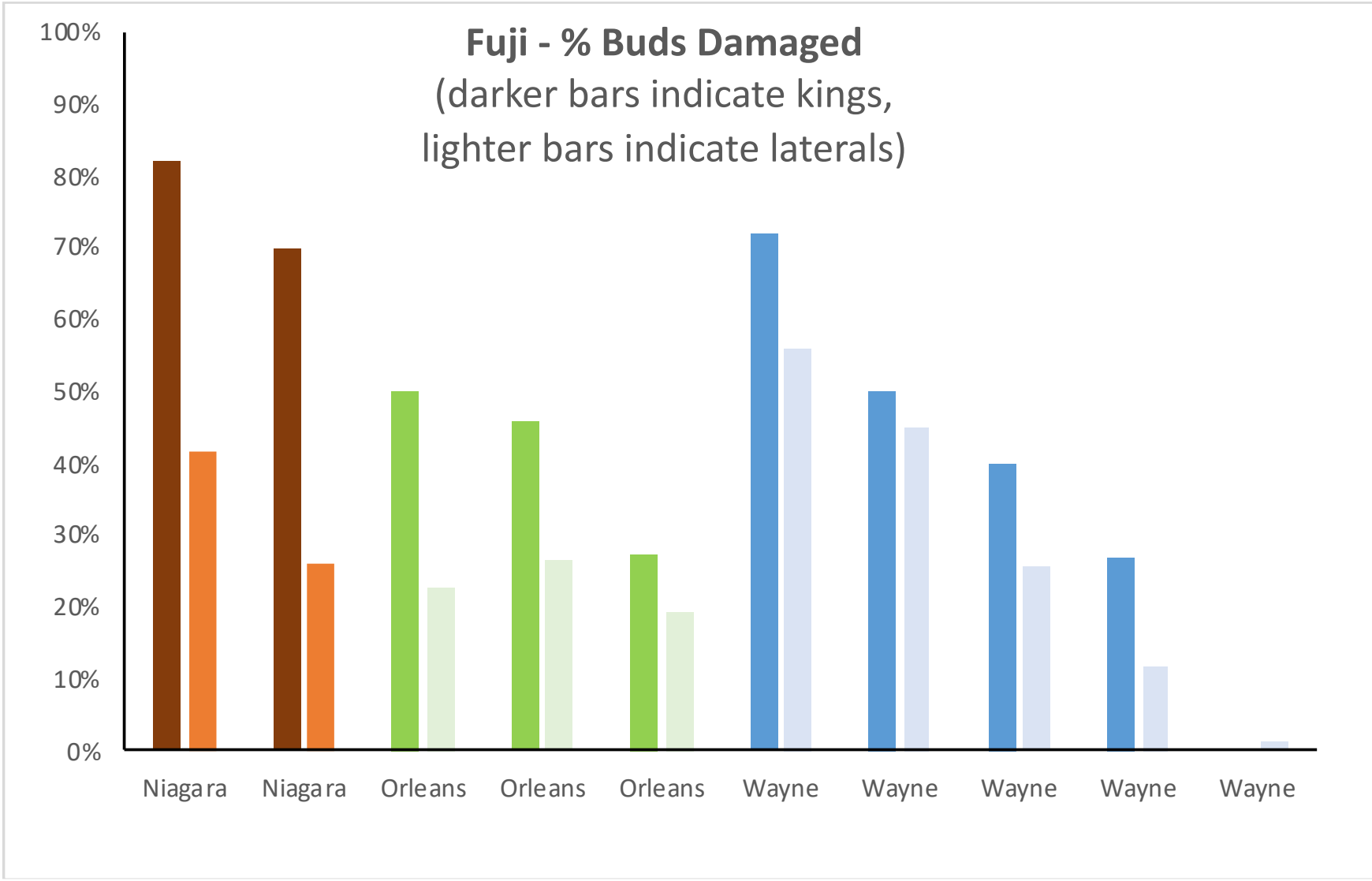
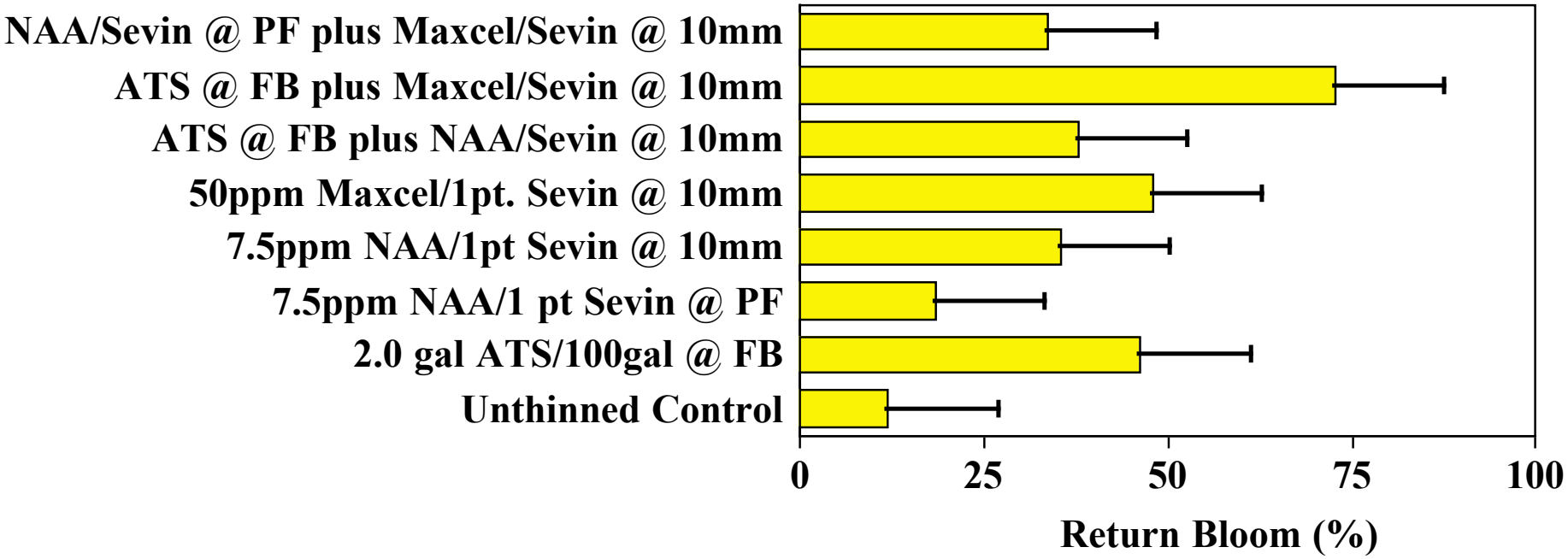

Gala - % Buds Damaged
(darker bars indicate kings,
lighter bars indicate laterals)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Niagara
Niagara
Niagara
Niagara
Orleans
Orleans
Orleans
Orleans
Orleans
Wayne
Wayne
Wayne
Wayne
Wayne
Wayne
Wayne


Fuji - % Buds Damaged
(darker bars indicate kings,
lighter bars indicate laterals)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Niagara
Niagara
Orleans
Orleans
Orleans
Wayne
Wayne
Wayne
Wayne
Wayne

Bloom Thinning in 2020

- Repeated frosts damaged kings flowers which made bloom thinning risky.

- Bloom Thinning is essential for return bloom of Honeycrisp and Fuji
- **To control biennial bearing in NYS we need to learn to do blossom thinning!!!**
- We use ATS in NY but spray at 60% on PTGM



Chemical Thinning Options

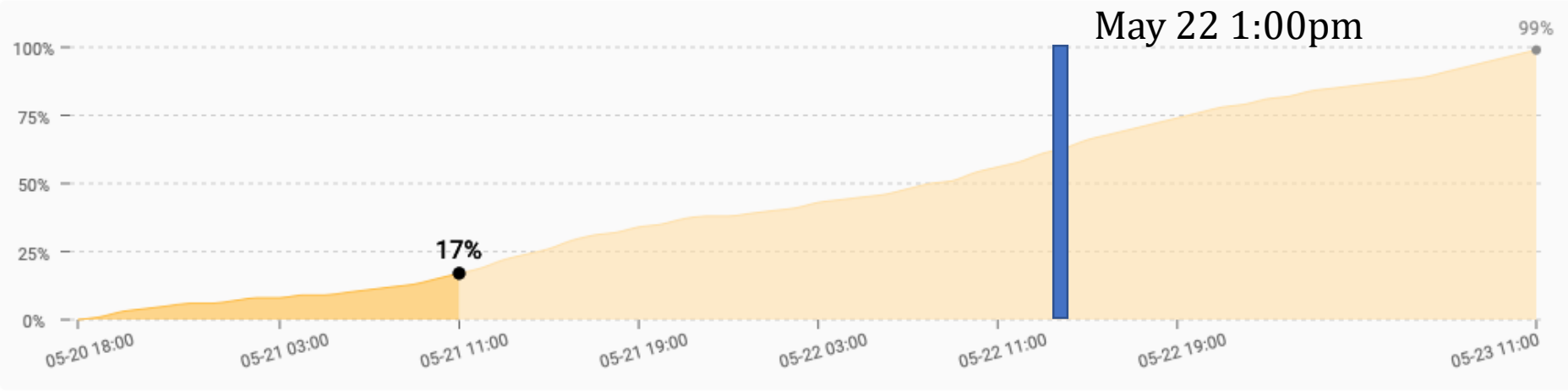
- Bloom
  - Ammonium Thiosulfate (ATS) 2.5%=2.5 gallons/100 gallons
  - Lime Sulfur and Oil
  - Promalin
  - Maxcel
  - NAA (10ppm=4 oz/100 gallons)
  - Amide-Thin
  - Regalia
- Petal Fall (fruits at 5-6mm)
  - Sevin
  - AmideThin
  - Maxcel + Sevin
  - NAA + Sevin
  - Maxcel + NAA
- Fruits at 11-13 mm
  - NAA + Sevin
  - Maxcel + Sevin
  - Maxcel + NAA
- Fruits at 15-20 mm
  - NAA + Sevin
  - Maxcel + Sevin + Oil
  - Ethrel + Oil

Bloom Thinning for 2020:

- Use the Pollen Tube Growth Model to time each spray
  - Measure style length (usually 8-12mm)
  - Begin model clock when the target number of king flowers are open.
  - Spray ATS when model reaches 60% not 100%
  - A second spray will be needed when model again reaches 60%
- If some kings are damaged then let more flowers open before beginning the model clock.
- If more than 40% of kings are damaged the spray NAA at full bloom (80% of all flowers open) to help improve return bloom.

RS20 2020	Gala	Geneva, NY	10.00 mm

The first blossom thinning spray in the Block should be applied when the pollen tube length has reached 100% of the style length. Entering this spray date resets the model to 0%.

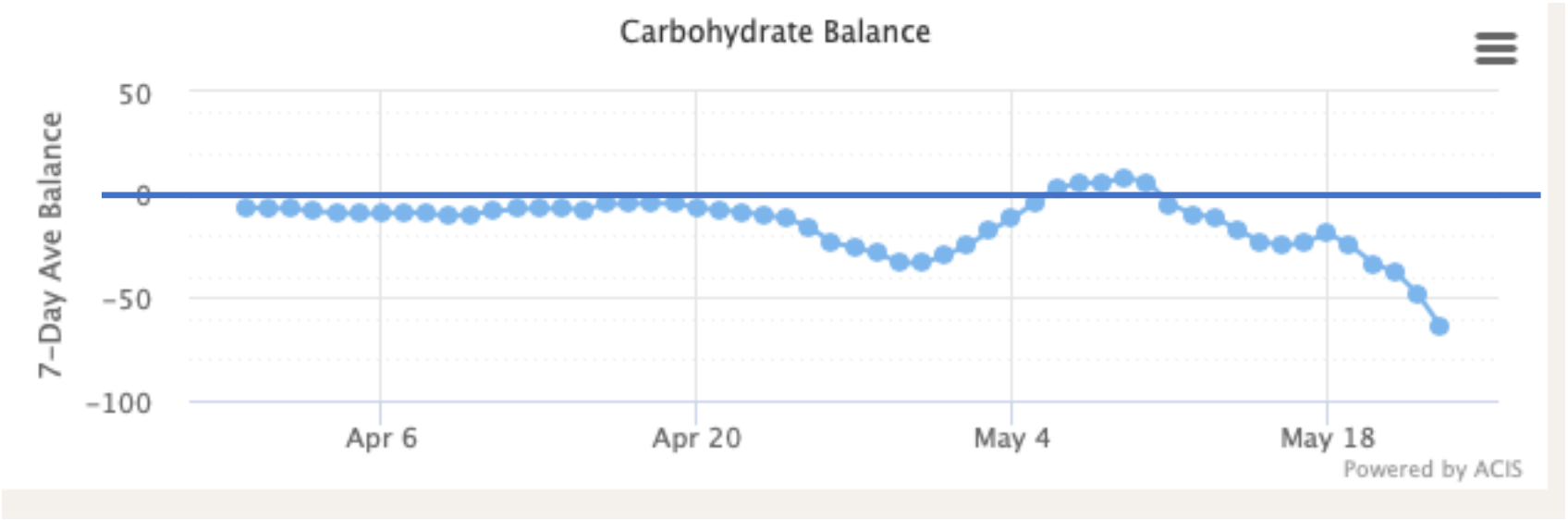


Set 1st Spray | Growth Table | Growth Graph

Post-Bloom Thinning for 2020:

- Use the carbohydrate model to avoid over-thinning
  - Both a Web-based version and a mobile phone version (MaluSim) are available
  - Don’t spray when carbohydrate deficits are -50 or less
- Use the degree day calculator in the carbohydrate model to target the best time for thinning (200-250 DD).
  - Spray petal fall thinners when DD=100-125.
  - Spray Rescue thinner between 300-350DD

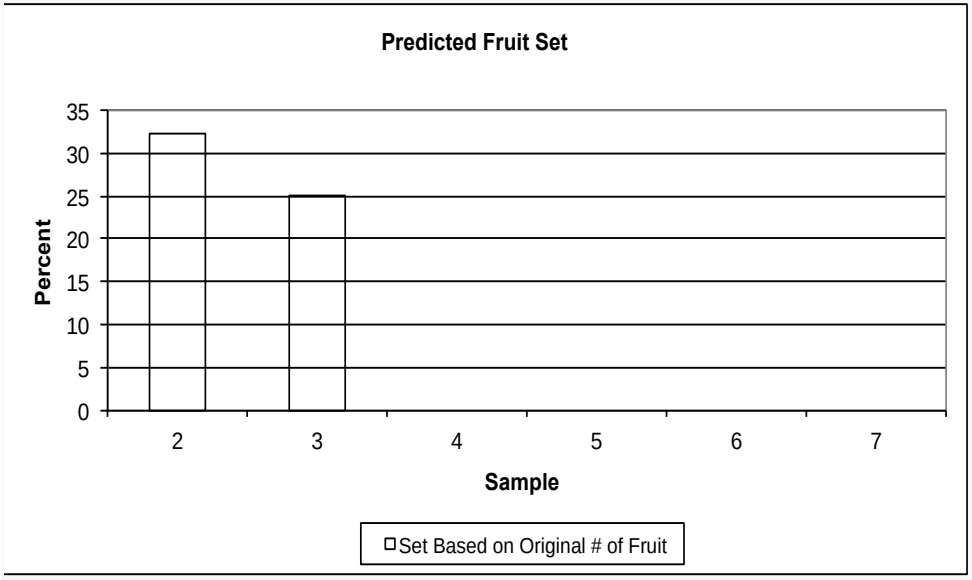
Carbohydrate Balance – Geneva, NY, May 21, 2020



	Max.	Min.	Radiation	Daily Deficit	Av Deficit	DD	
5/18	58	55	4.1	-46.55	-18.77	0.0	-
5/19	69	54	22.6	-19.68	-24.7	0.0	-
5/20	70	49	29.7	0.12	-33.44	0.0	-
5/21	71	44	24.4	-2.0	-37.61	10.1	Apply Standard Chemical Thinning Rate
5/22	74	55	20.4	-36.0	-48.48	24.2	Apply Standard Chemical Thinning Rate
5/23	75	56	15.6	-57.52	-64.06	38.8	Decrease Chemical Thinning Rate by 15%
5/24	78	58	18.1	-72.45	-	54.8	-
5/25	78	60	21.9	-75.74	-	71.4	-
5/26	82	62	22.3	-95.8	-	89.6	-
5/27	80	64	18.3	-108.88	-	107.8	-
	Text color represents expected thinning efficacy: Blue=Mild; Green=Good; Orange=Very good; Red=Excessive						

To assess the effectiveness of each spray use the Fruit Growth Rate Model

SUMMARY	Variety, Strain							0	2007
	Treatment				0		Block	1	
Sampling			Diameter (mm)			Number of Fruit			Predicted %	
Number	Date	Days between sample dates	Mean of all measured fruitlets	Mean growth of up to 3 fastest growing fruitlets per tree	50% of fastest growing fruitlets	>50% fastest	<50% fastest	Measured	Set Based on Original # of Fruit	Drop Based on Original # of Fruit
1	5/25	0	6.49					471		
2	5/29	4	8.16	4.90	2.45	152	208	360	32.3	67.7
3	6/1	3	9.38	4.14	2.07	118	191	309	25.1	74.9
4				0.00	0.00	0	0	0	0.0	100.0
5				0.00	0.00	0	0	0	0.0	100.0
6				0.00	0.00	0	0	0	0.0	100.0
7				0.00	0.00	0	0	0	0.0	100.0



Take-Home Suggestions for 2020:

1. Assess each block and each variety.
   - If king flower damage is less than 40% then
     - Blossom thin Honeycrisp, Fuji and Gala with ATS
     - Wait until petal fall to thin other varieties
   - If king flower damage is greater than 40% but the lateral flowers are undamaged then
     - Do not blossom thin
     - Wait until petal fall to thin
   - If total flower damage is greater than 75%, don't thin this year but adjust crop load by hand thinning.
2. Chemically thin using the "Precision Thinning Program"
   1. Apply a petal fall thinning spray at 100-125 DD.
   2. Assess response by measuring fruitlet diameter and using the fruit growth rate model.
   3. If necessary, apply a thinning spray at 12-13mm (200-250 DD).
   4. Re-assess response with Fruit Growth Rate Model.
   5. If necessary apply a thinning spray at 18-20mm (300-350 DD).
3. Where there has been frost damage, apply no thinner to the bottom half of tree.
4. Don't use surfactants like Regulaid or Oil.


Thank You for Your Attention
Questions?
Irrigation.