IPCs. New data on tree performance and lessons learned

Fernando Alferez, UF-IFAS SWFREC Immokalee

UF IFAS UNIVERSITY of FLORIDA

Young vs Mature Citrus Trees

Different biology, different requirements

Mature trees

- Already infected with HLB
- Declining production

Young trees

- Planted healthy, HLB-free
- They are not producing yet

UF IFAS
UNIVERSITY of FLORIDA

Young vs Mature Citrus Trees
DESIRED GOALS

Mature trees

Maintain trees productive and improve tree health

Young trees

Keep trees free from disease until they enter production age or longer

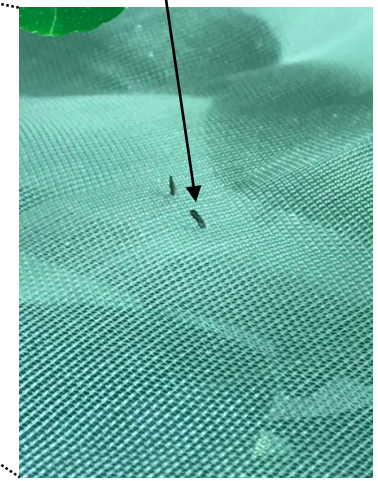
UF IFAS
UNIVERSITY of FLORIDA

Individual Protective Covers for Young Trees

UF IFAS
UNIVERSITY of FLORIDA

Psyllid exclusion

Adult psyllid
0.57 mm width



50 mesh screen bags
0.26mm wide

UF IFAS
UNIVERSITY of FLORIDA

Full newly planted grove

Resets in an older grove

Versatile system

UF IFAS UNIVERSITY of FLORIDA

- Citrus Research and Development Foundation (Project # 18-032C)
- Southern Citrus Nurseries and The Tree Defender Inc

UF IFAS
UNIVERSITY of FLORIDA

Questions

- Are IPCs effective to prevent infection with CLas ?
- Other pests/diseases?
- Does IPC affect physiology and productivity of the trees? How?
- For how long can an IPC cover a tree?
- Can trees set fruit? Are all varieties equal?

UF IFAS
UNIVERSITY of FLORIDA

Field trial at SWFREC

Planted January 2018

Valencia on Cleopatra

Six combinations of treatments

1	IPCs/ no insecticides
2	IPCs/ half dose insecticides
3	IPCs/ full dose insecticides
4	without IPCs/ no insecticides
5	without IPCs/ half dose insecticides
6	without IPCs/ full dose insecticides

Insecticides	**No**	**Half**	**Full**
Thiamethoxan	0	0.0065	0.0131
Imidacloprid	0	0.0125	0.025
Clothianidin	0	0.01	0.02

Dosages unit: FL oz per tree

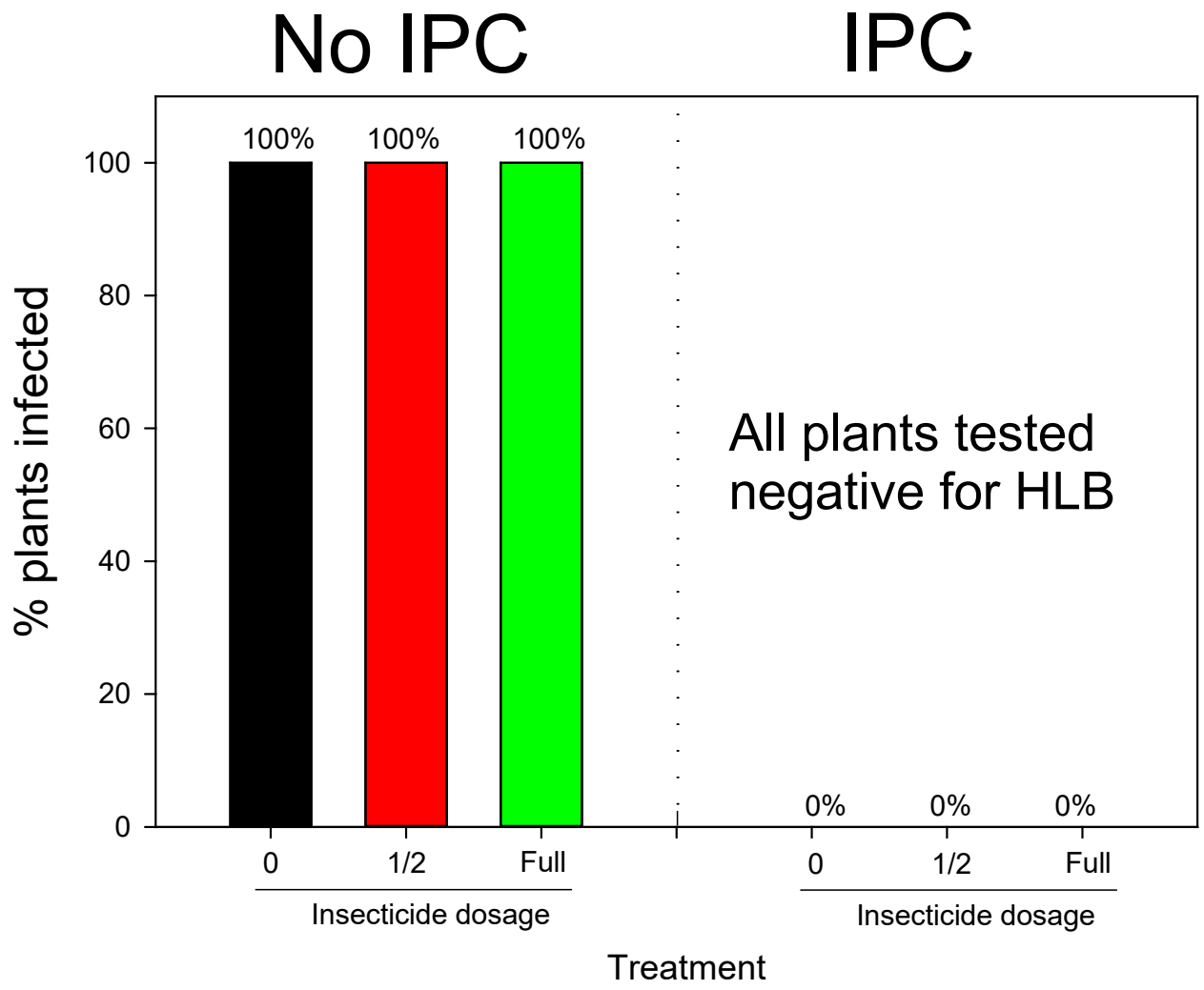
UF IFAS UNIVERSITY of FLORIDA

Additional sites

- Sugarbelle
- Tango
- Early Pride
- On Sour and US942 rootstocks

UF IFAS
UNIVERSITY of FLORIDA

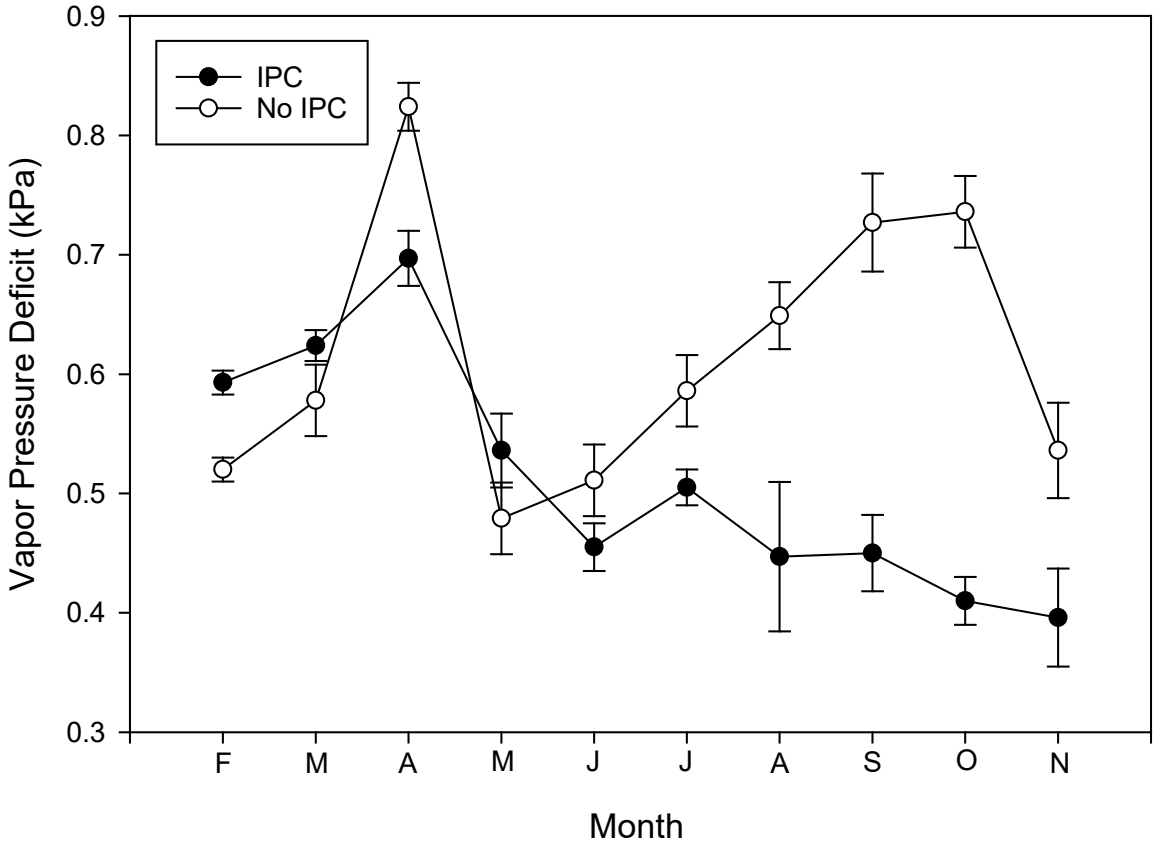
IPCs prevent HLB infection……..



32 months after planting

UF IFAS
UNIVERSITY of FLORIDA

……. changes tree's environment…….



UF IFAS
UNIVERSITY of FLORIDA

….and improves tree growth

Vapor Pressure Deficit

Increased photosynthesis
Increased vegetative growth

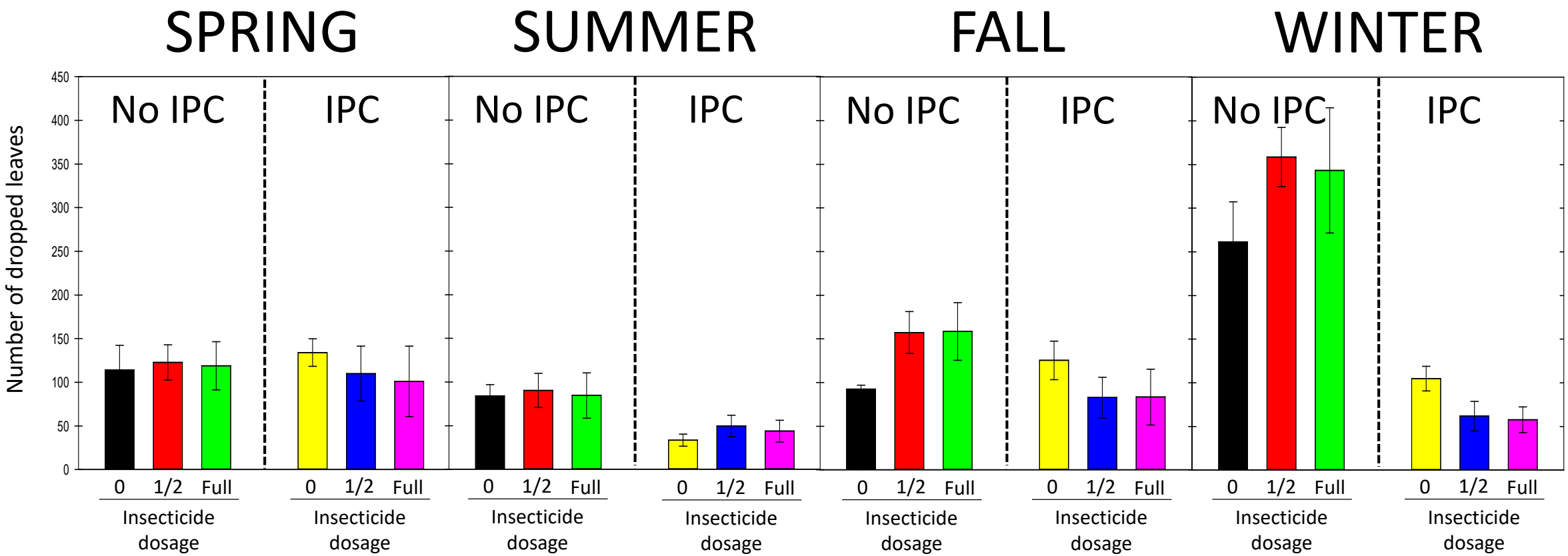
20 months

UF IFAS
UNIVERSITY of FLORIDA

IPC removed after 18 months

UF IFAS
UNIVERSITY of FLORIDA

Cumulative leaf drop



Seasonal leaf drop seems to be alleviated by the IPCs

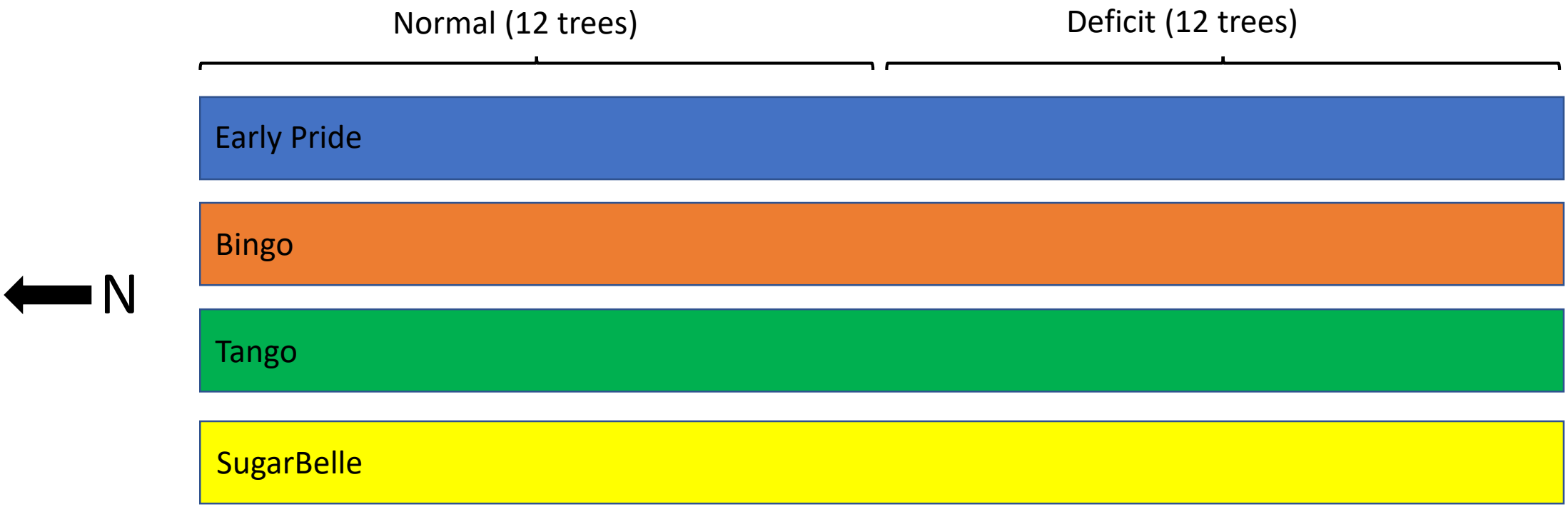
UF IFAS UNIVERSITY of FLORIDA

What about blooming and fruit set?

- If trees are not infected by HLB and hence, stress is low, we may want to assay some deficit irrigation to induce blooming.
- Some varieties can be managed to set fruit in the absence of pollination.
- We are assaying these strategies in cultivars for fresh fruit production, including Sugarbelle, Bingo, Early Pride, and Tango in our CUPS facility.
- Our experience in CUPS can be translated to our IPC setting.

UF IFAS
UNIVERSITY of FLORIDA

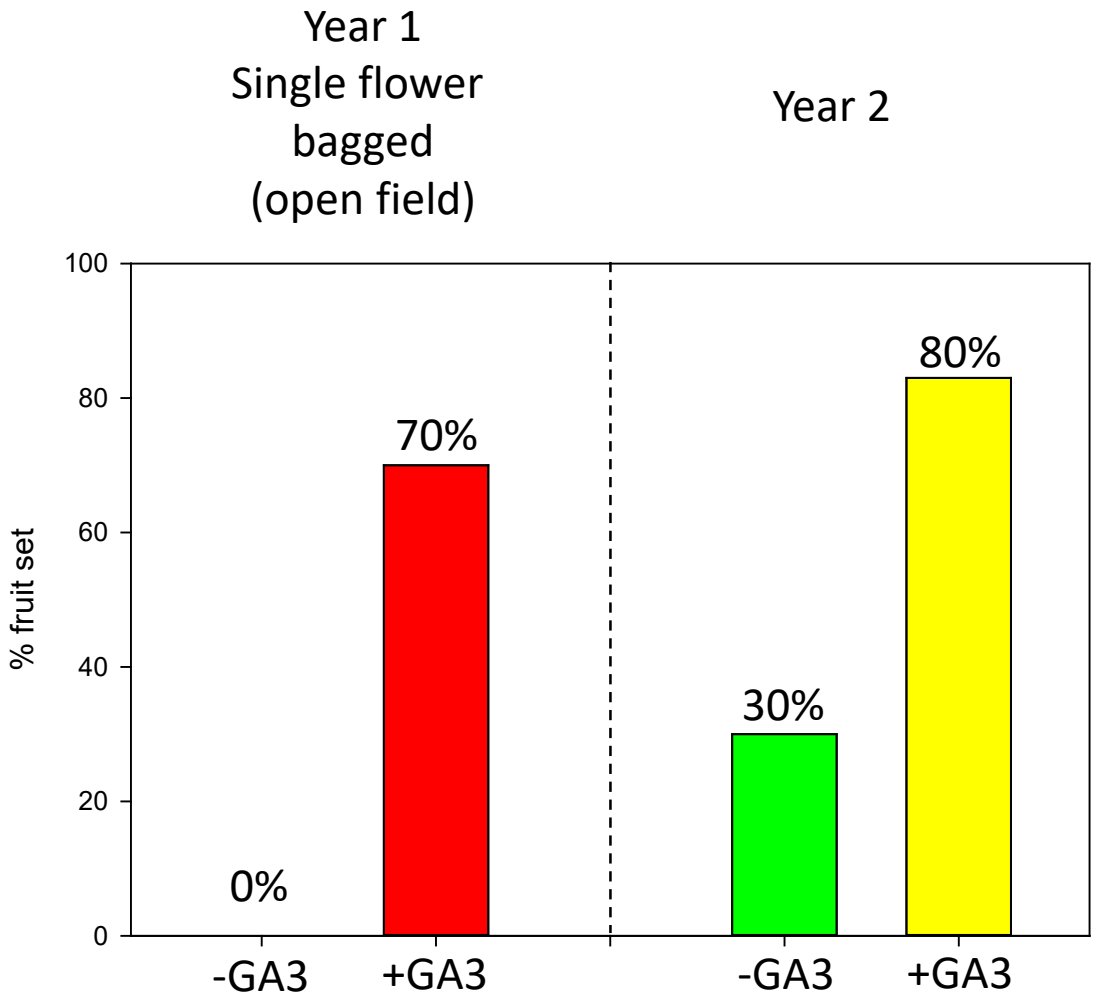
Deficit irrigation



Treatment started on January 10.
Deficit irrigation: Water once every 15 days to field capacity for 2 months
Control irrigation: normal irrigation every other day.
Treatment ended on March 2.

Blooming advanced in deficit-irrigated trees. We will assess yield in the coming months

UF IFAS
UNIVERSITY of FLORIDA

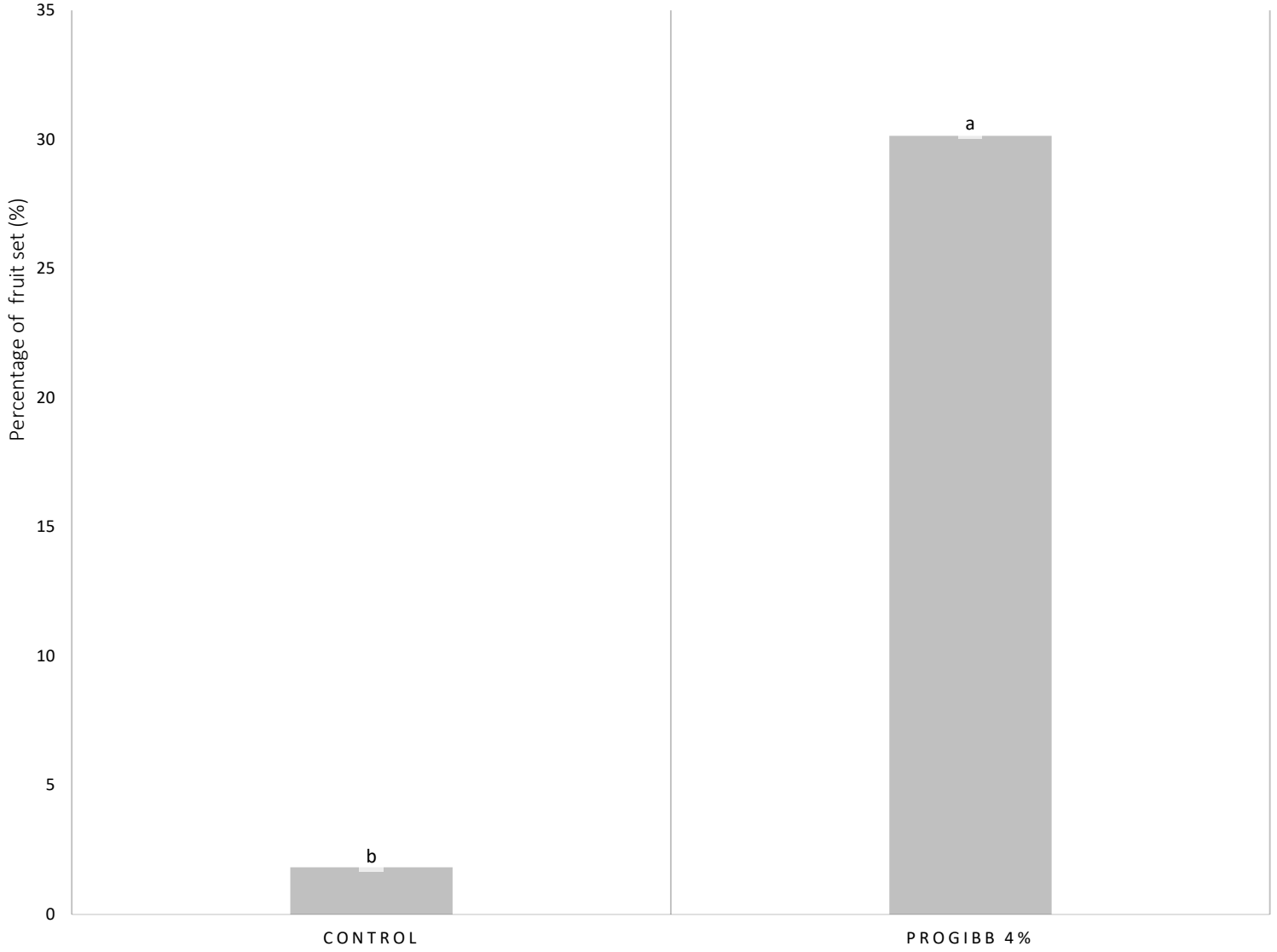


SugarBelle

We eliminated seeds

UF IFAS
UNIVERSITY of FLORIDA

Tango (with or without GA)



UF IFAS UNIVERSITY of FLORIDA

Things to solve

Other pests

Growth constraints

UF IFAS
UNIVERSITY of FLORIDA

UF IFAS
UNIVERSITY of FLORIDA

Other pests

	Spodoptera	Psyllids	Snow scale	Black scale	Purple scale	Aphids
IPC	Y	N	Y	Y	Y	Y
No IPC	N	Y	N	N	N	Y

UF IFAS
UNIVERSITY of FLORIDA

Summary

- After 32 months, IPC prevented ACP transmission and HLB infection.
- Insect scouting and pest and disease management are still necessary.
- Seasonal leaf drop seems to be muted by IPCs. This is probably an effect of more stable conditions inside the covers.
- Increasing IPC capacity allows trees to grow better and unfold branches. This process starts within days.
- Some varieties are able to set fruit under the IPCs with adequate horticultural management. We are currently investigating requirements for several varieties.

UF IFAS
UNIVERSITY of FLORIDA

Thanks

- Citrus Research and Development Foundation (Project # 18-032C)
- Southern Citrus Nurseries and The Tree Defender Inc

- Dr Ute Albrecht
- Dr Ozgur Batuman
- Dr Jawwad Qureshi
- Dr Mongi Zekri
- Susmita Gaire, Ms student

UF IFAS UNIVERSITY of FLORIDA