

Combining IPCs and Brassinosteroids to prolong health in young citrus trees: updates and future research

Fernando Alferez, SWFREC UF/IFAS Immokalee
alferez@ufl.edu

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Young vs Mature Citrus Trees

Different biology, different requirements

Mature trees

- Already affected by HLB.
- Declining production.

Young trees

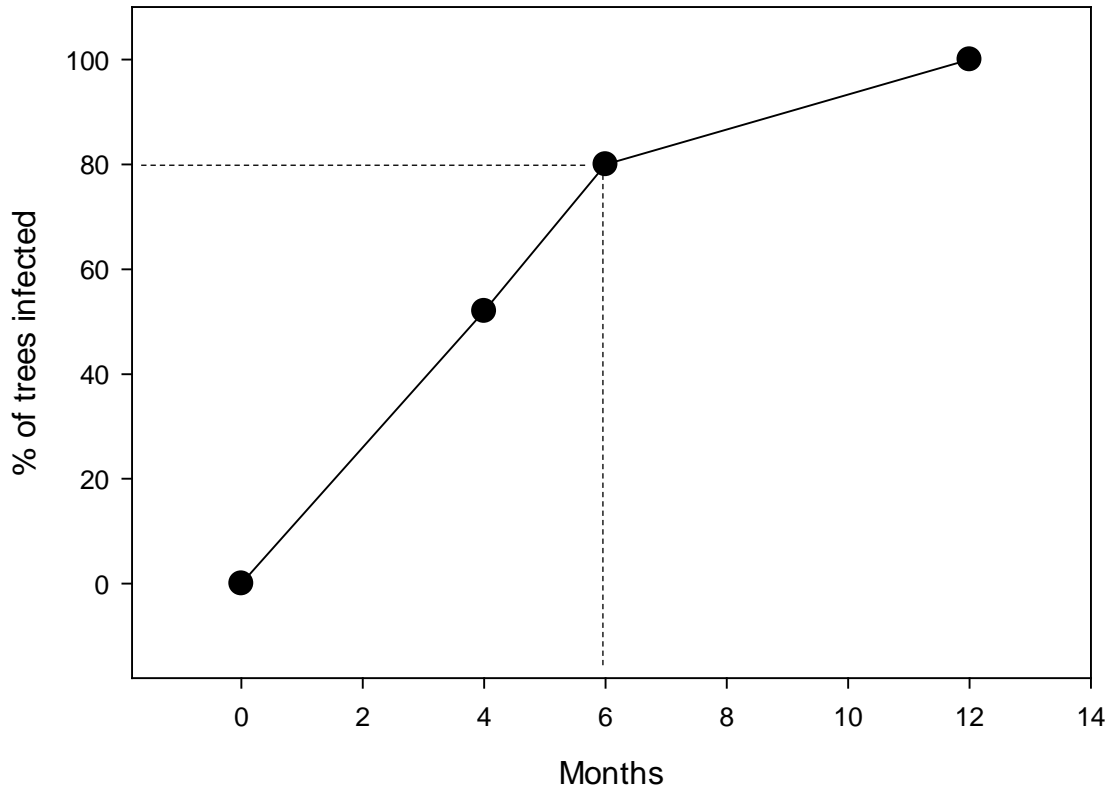
- Planted healthy, HLB-free
- They are not producing yet.

Desired goals

- Maintain trees productive and improve their health.
- **Improve fruit yield and quality.**
- Keep trees free from disease until they enter production age or longer.



The rate of HLB infection in a non-protected, newly planted citrus grove



In less than 6 months, most newly planted trees in a grove tested positive for HLB

Individual Protective Covers for Young Trees



Adult psyllid
0.57 mm width



50 mesh screen bags
0.26mm wide



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Individual protective covers (IPCs) to prevent Asian citrus psyllid and *Candidatus Liberibacter asiaticus* from establishing in newly planted citrus trees

Susmita Gaire^a, Ute Albrecht^{a, *}, Ozgur Batuman^a, Jawwad Qureshi^a, Mongi Zekri^b, Fernando Alferez^{a, *}

^a Southwest Florida Research and Education Center, University of Florida, Institute of Food and Agricultural Sciences UF-IFAS, 2685, SR 29 N, Immokalee, FL, USA

^b Hendry County Extension, University of Florida, Institute of Food and Agricultural Sciences UF-IFAS, 1085, Pratt Blvd, LaBelle, FL, USA

UF | IFAS Extension
UNIVERSITY of FLORIDA



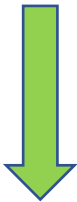
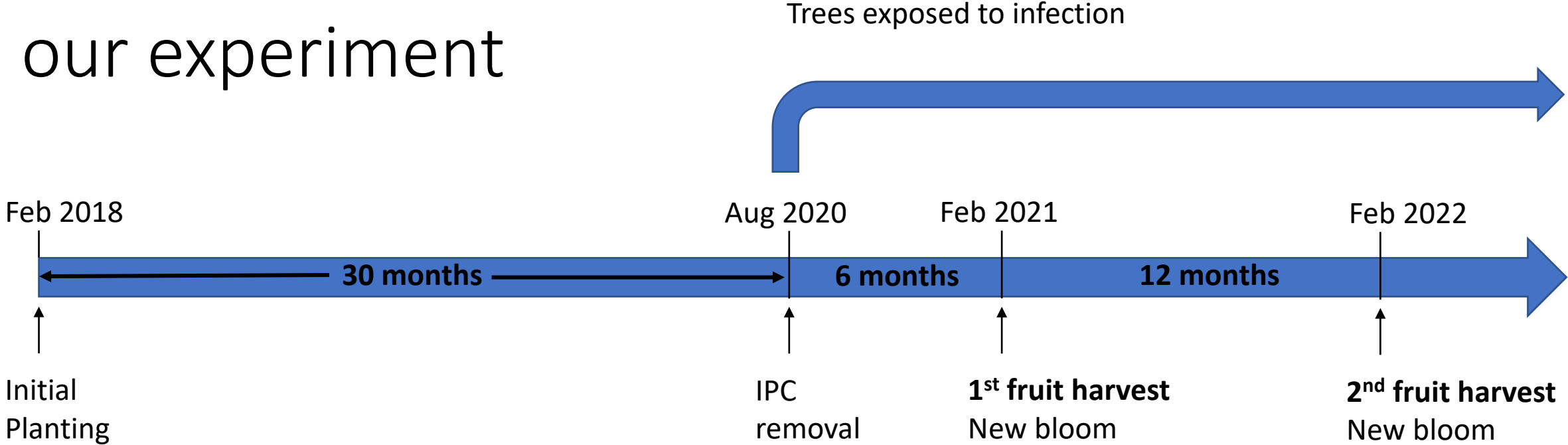
HS1425

<https://doi.org/10.32473/edis-HS1425-2021>

Individual Protective Covers (IPCs) for Young Tree Protection from the HLB Vector, the Asian Citrus Psyllid¹

Fernando Alferez, Ute Albrecht, Susmita Gaire, Ozgur Batuman, Jawwad Qureshi, and Mongi Zekri²

Timeline of our experiment

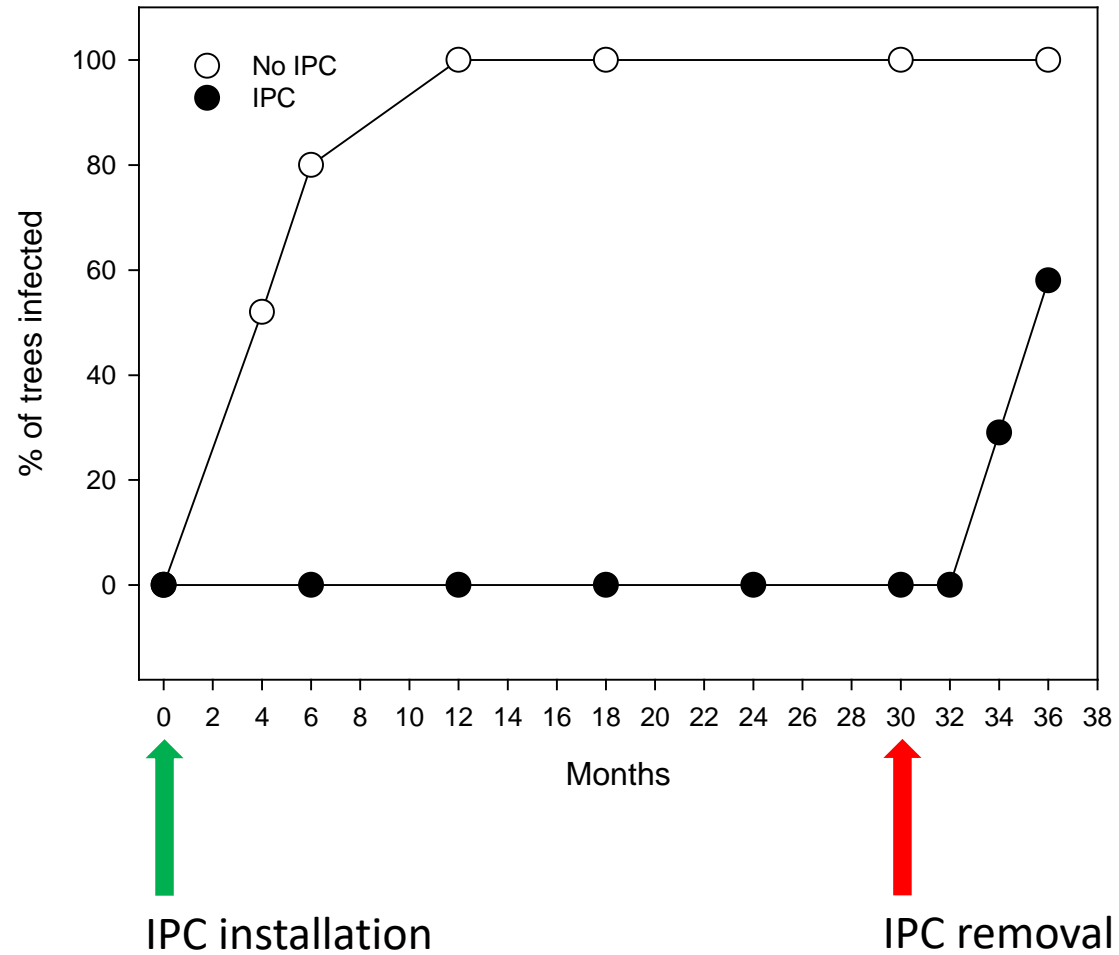


Fruit quality analysis



Fruit quality analysis

The rate of HLB infection after IPC removal





Fruit quality was improved by IPCs

6 months after IPC removal

18 months after IPC removal

2020-2021 SEASON

2021-2022 SEASON

Factor	Brix (%)	TA (%)	Brix (%)	TA (%)
No IPC	7.5 b	0.6	7.0 b	1.1
IPC	10.9 a	0.8	9.6 a	0.84
P-value	0.009**	0.294	0.01*	0.1

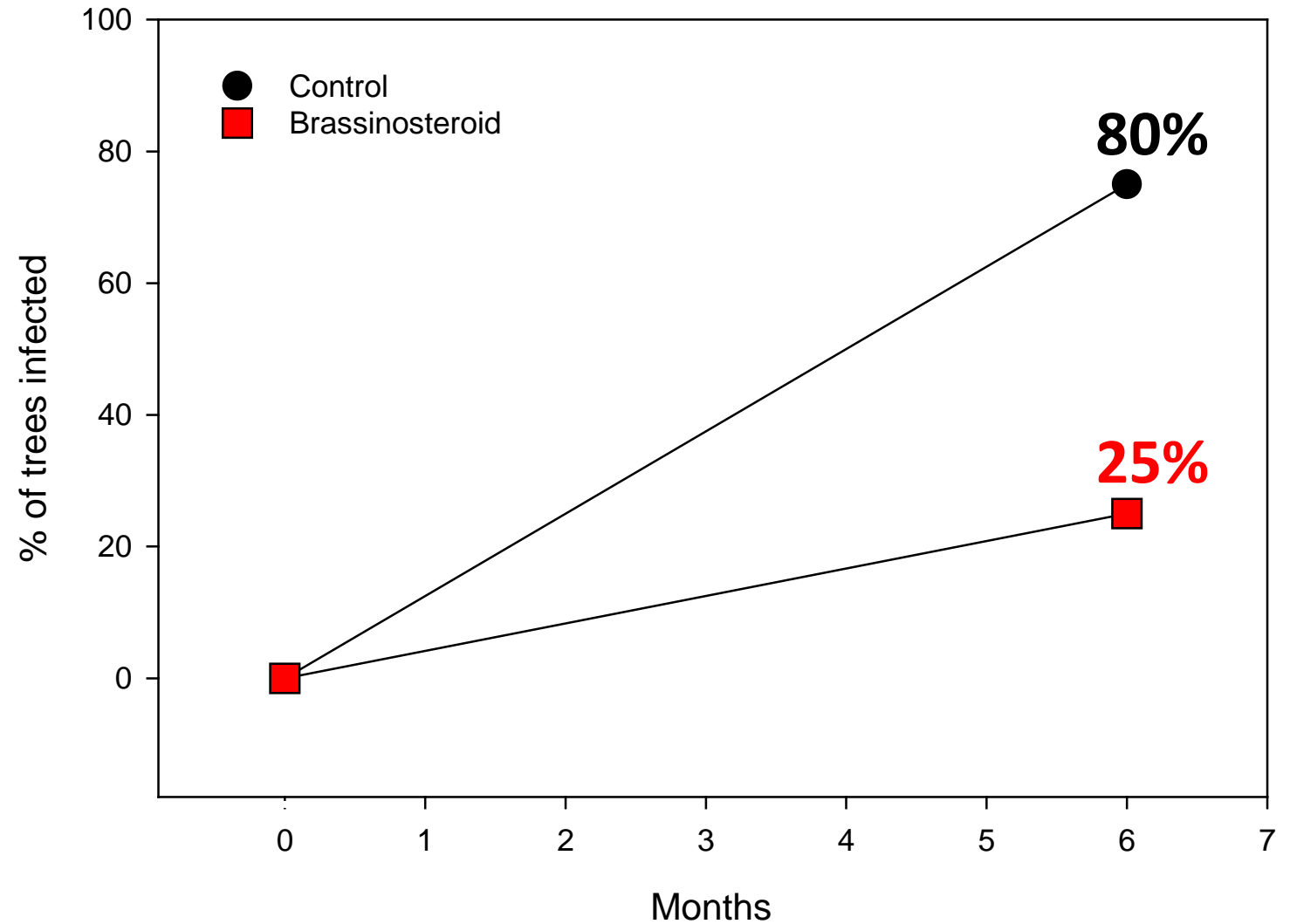
CAN WE MAINTAIN TREE HEALTH OVER TIME? HOW ABOUT FRUIT QUALITY?

Desired goals

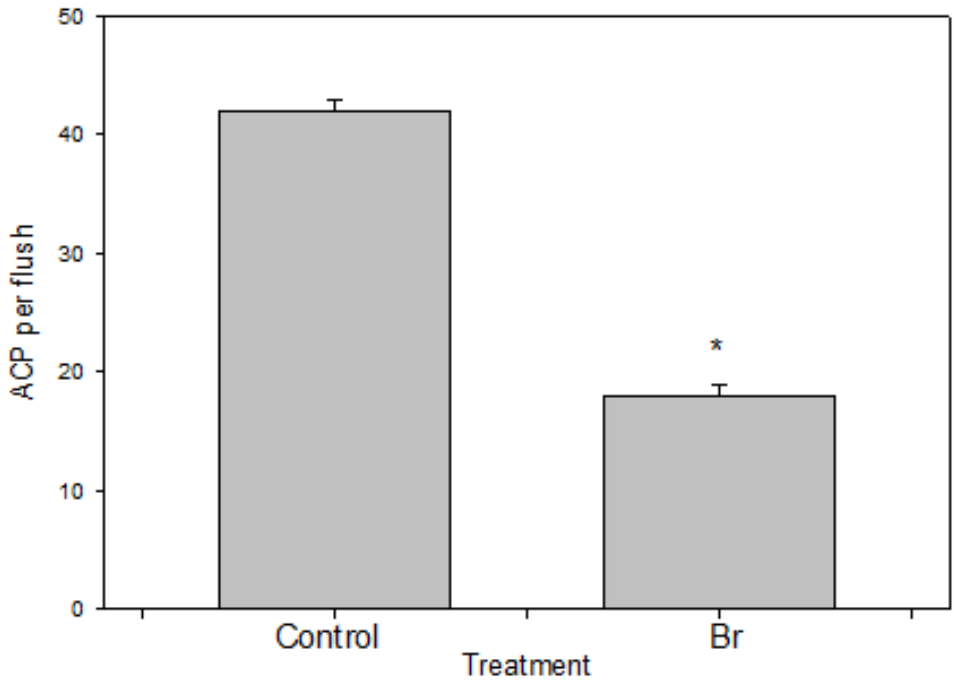
- **Keep trees free from disease** until they enter production age or longer.
- **Maintain trees productive** and improve their health.
- **Improve fruit yield and quality.**



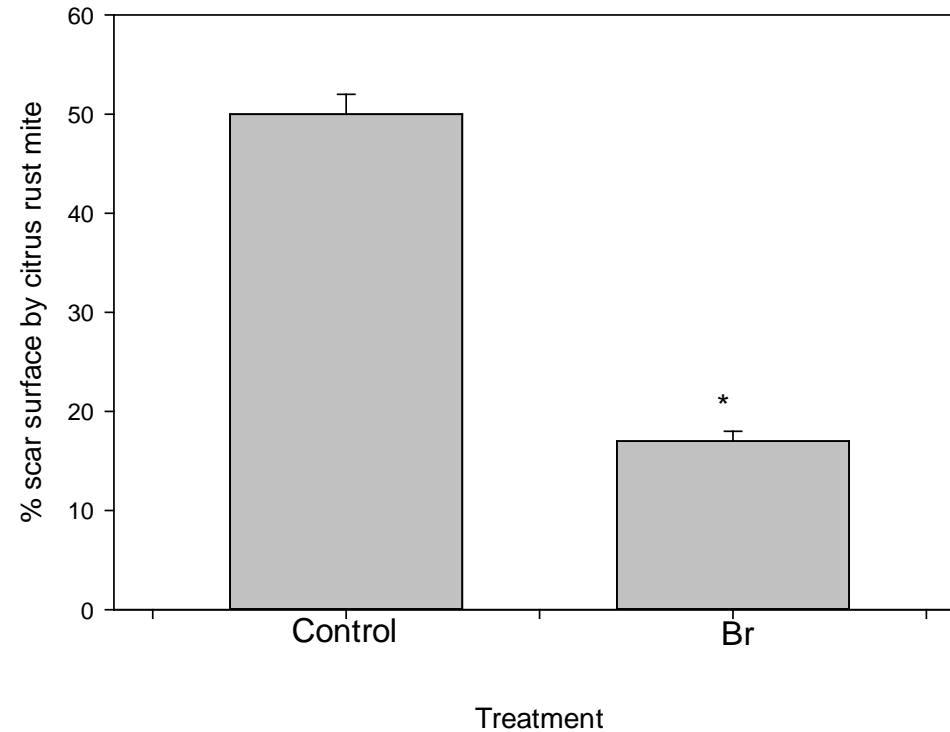
Brassinosteroid
reduce rate of HLB
infection
in trees
non covered with
IPCs



ACP incidence was reduced



Other pests (i.e. Rust mite) were reduced

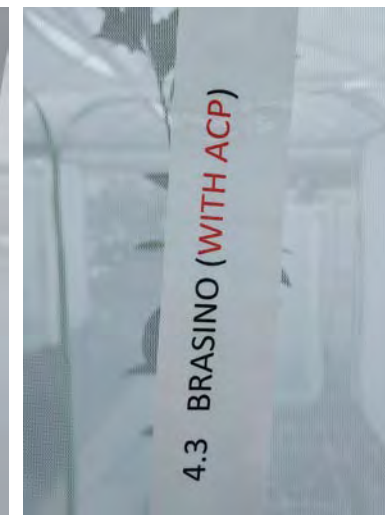
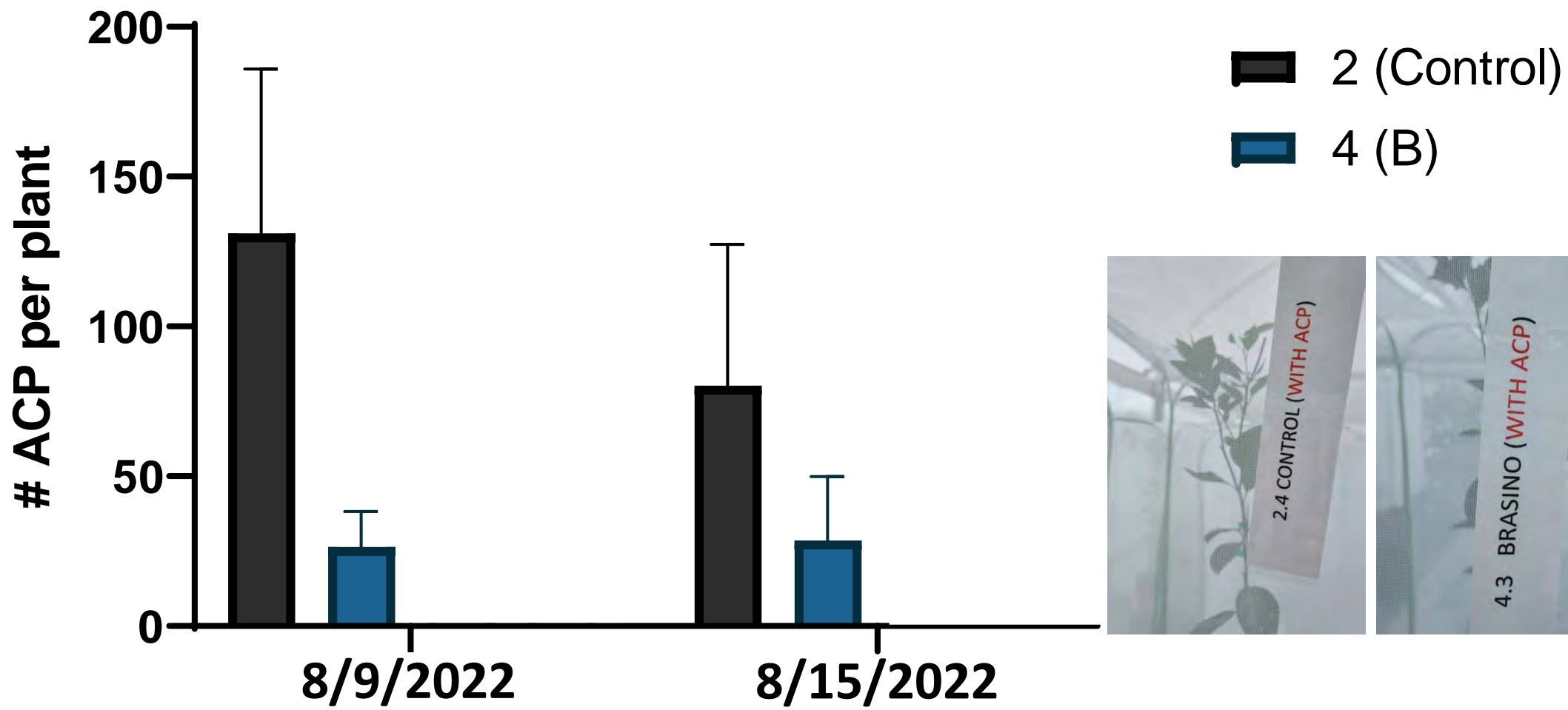


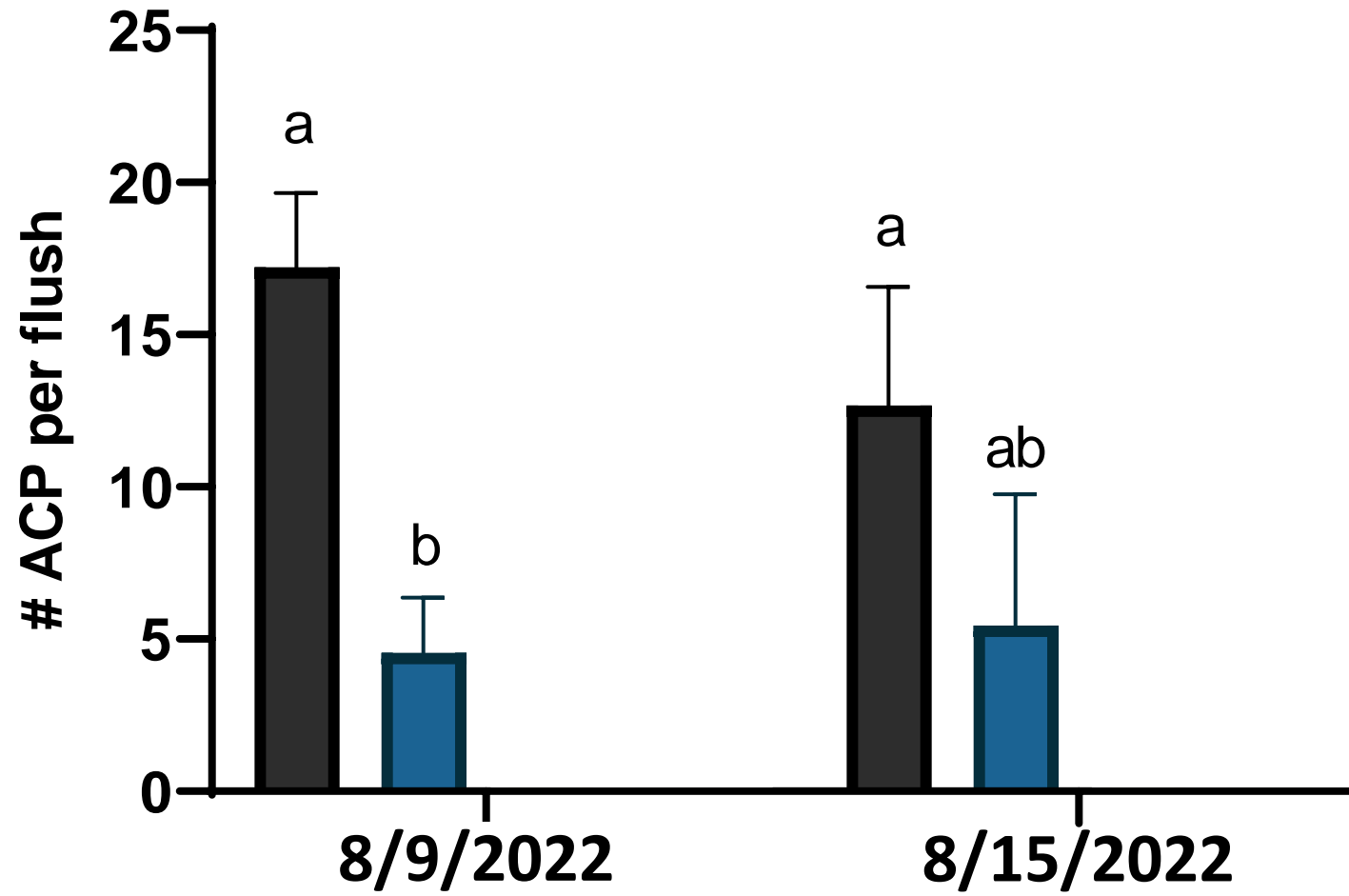
Alferez et al., 2022, submitted

Deciphering the role of Brs on citrus plant immunity



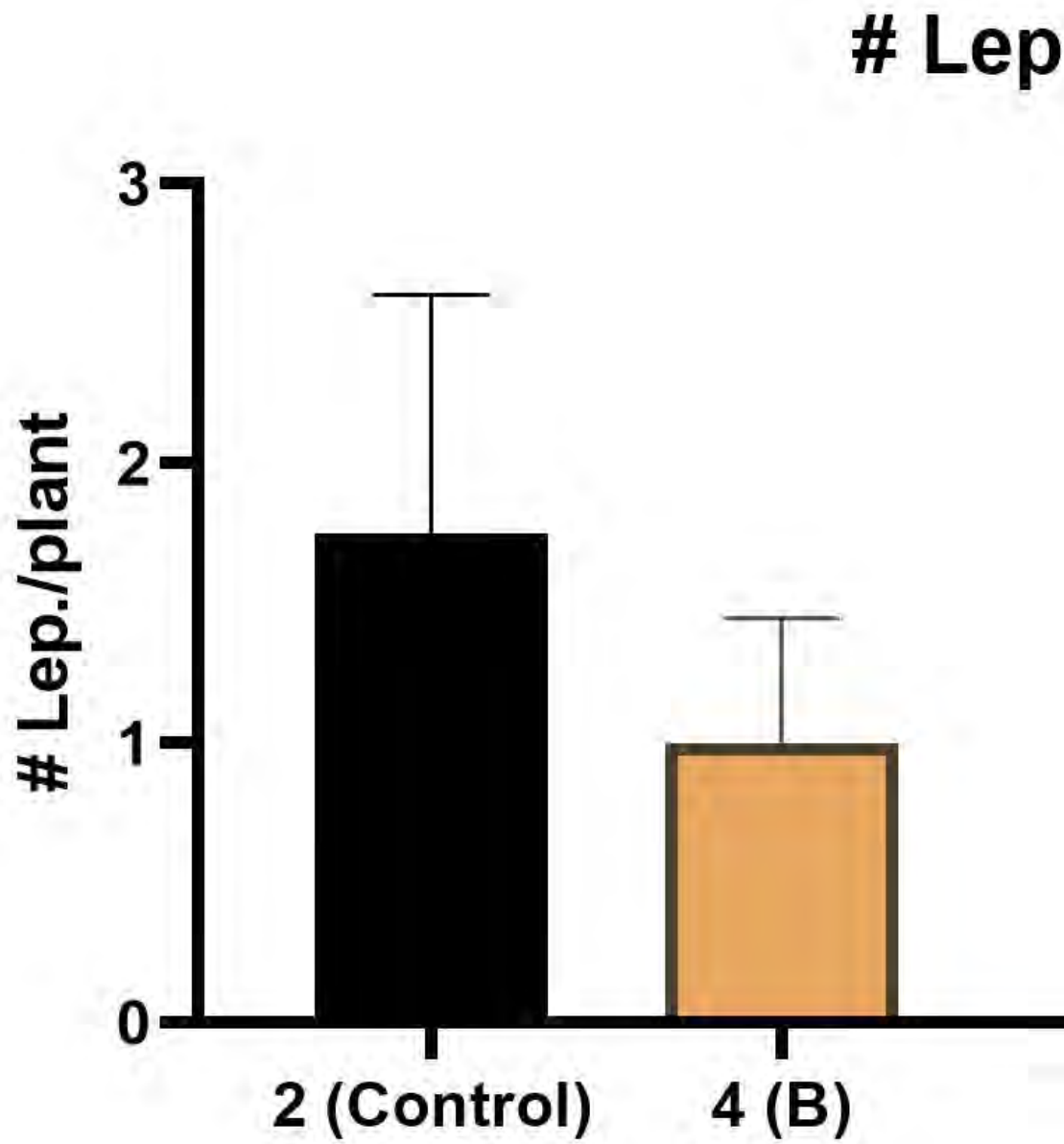
Dr Meritxell Perez-Hedo
Prof Alberto Urbaneja





■ 2 (Control)
■ 4 (B)





Our approach: IPC + Br System



IPC until tree starts
to bear fruit

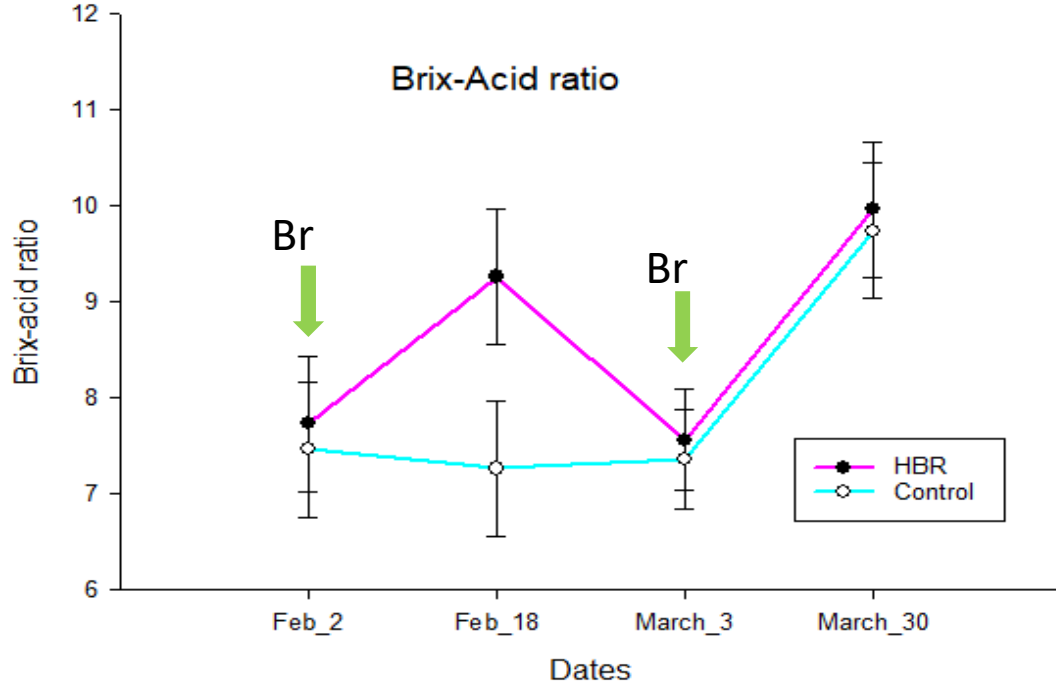
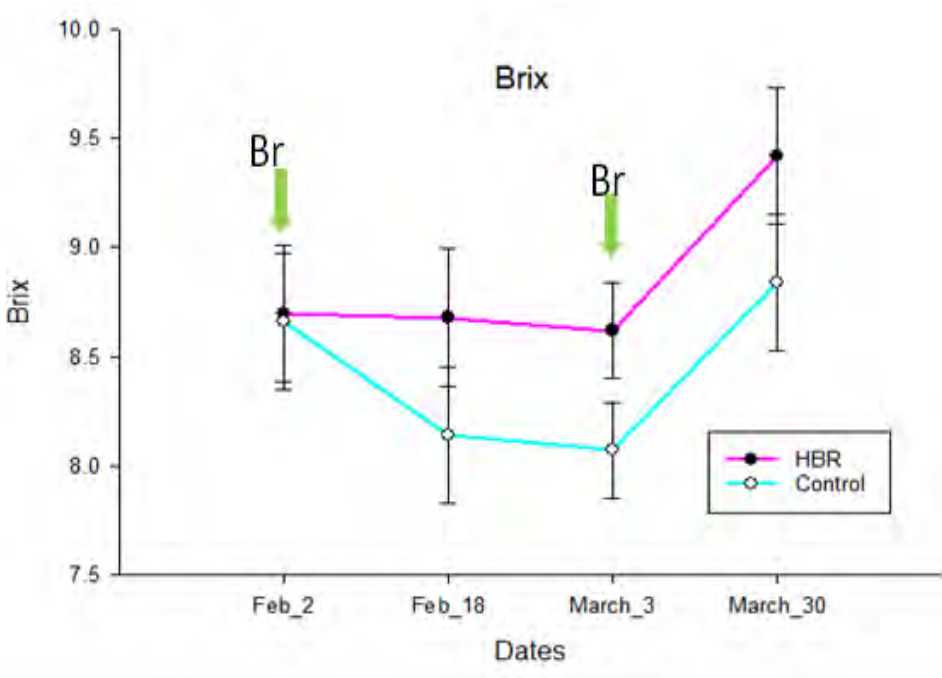


IPC removal



Br treatment
Once per month
@ 6,28 fl oz per 100 gallons water

Internal quality was improved in Valencia fruit **from mature, infected trees** after just one Br application @ 186mL/100 gallons of water (6,28 fl oz /100 gallons water)



Take home messages and next steps

- IPCs protect against HLB and improve fruit quality.
- Brs can reduce rate of HLB infection in exposed young trees. The mechanism is not clear yet. ***Work in progress***
- We still don't know for how long the protective effect of Br against HLB will last in young trees. ***Work in progress***
- Combining IPCs and Brs holds promise to prolong tree health and help to improve fruit yield and quality. ***Work in progress***

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Marwa Ahmed

Tim Gast

Maria Martinez

Susmita Gaire

Daniel Boakye