



Tools for low chill and earlier budbreak

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April 24



May 6

Why is winter chill important?

‘Howard’ walnuts, 3rd leaf
Solano County, 2020

Photo: K. Jarvis-Shean

'Chandler' 5th leaf
April 28th, 2020
Sutter County.

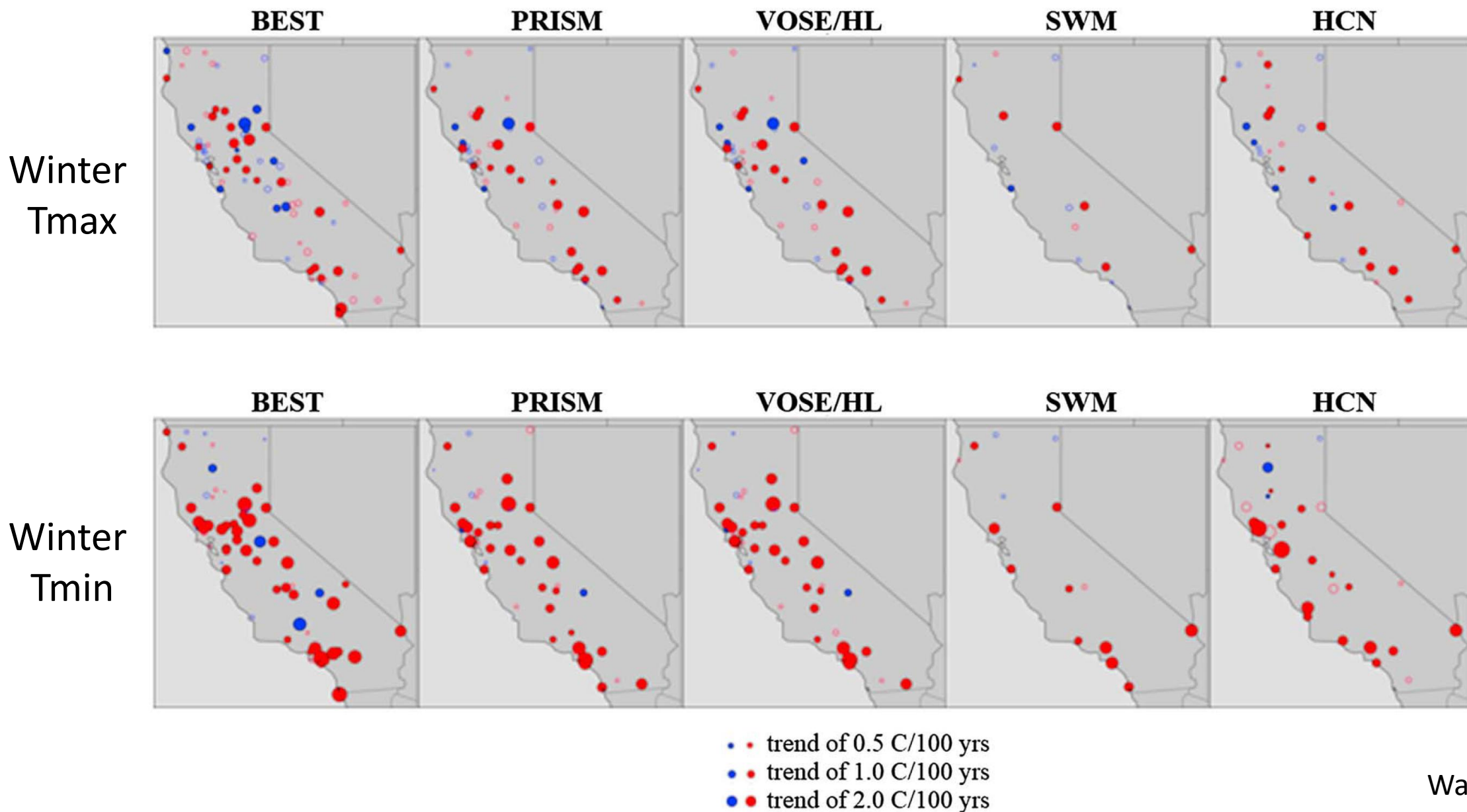


Size variability, mature Howard, May 6th,
Solano County. Photo: K. Jarvis-Shean



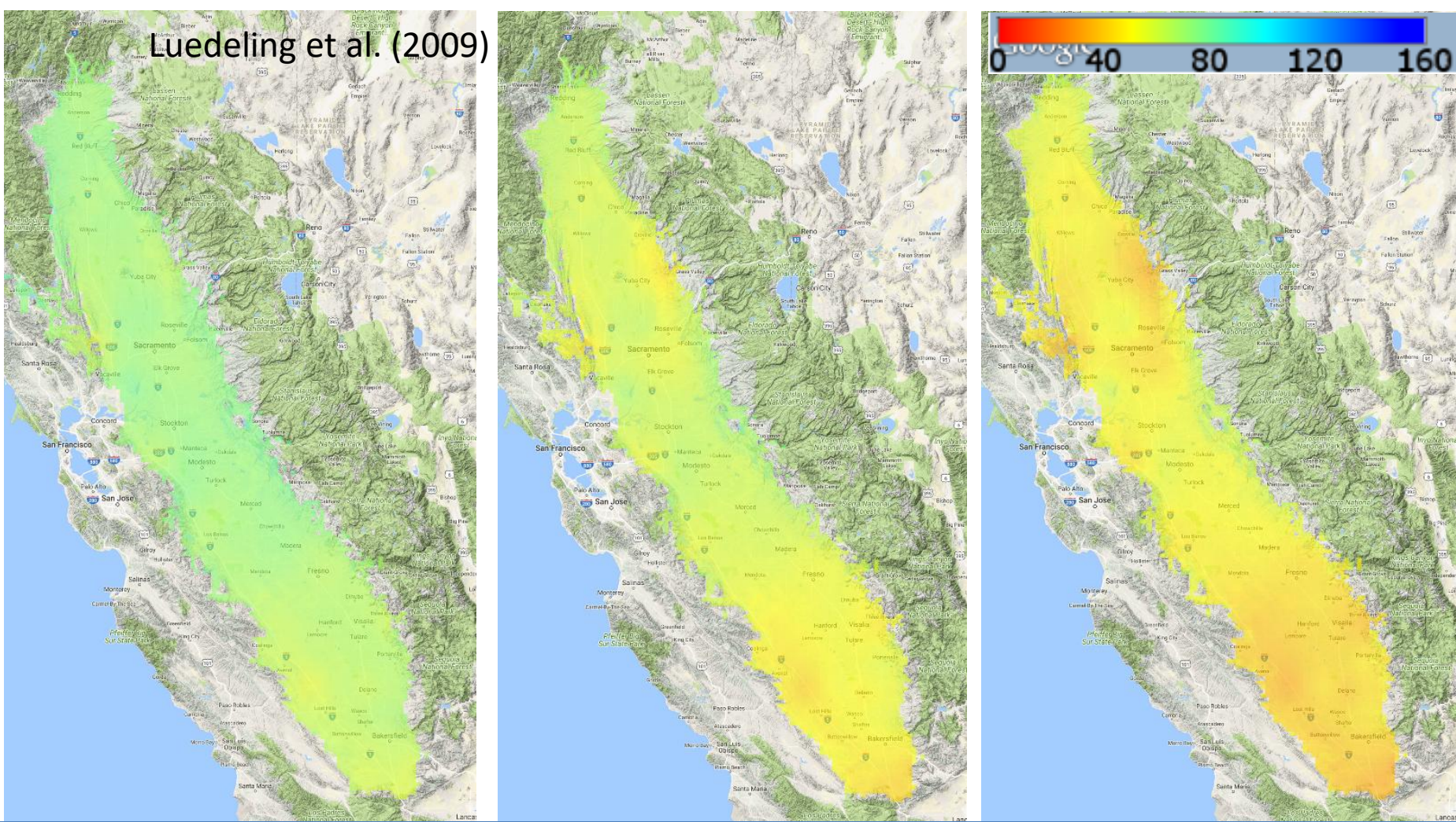
Photo: Luke Milliron

Central Valley winters have been getting warmer.



Future Chill 90% of years

Luedeling et al. (2009)



Turn of the Century

Mid 21st Century

End 21st Century

Sac Valley

71

59 (↓ 15%)

50 (↓ 30%)

N. San Joaquin

71

61 (↓ 15%)

51 (↓ 30%)

S. San Joaquin

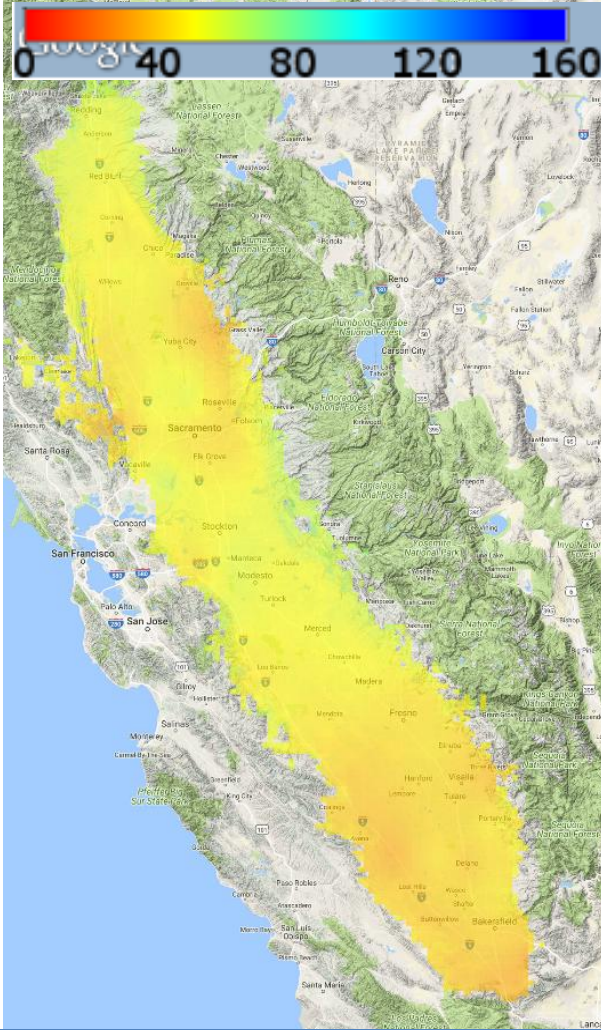
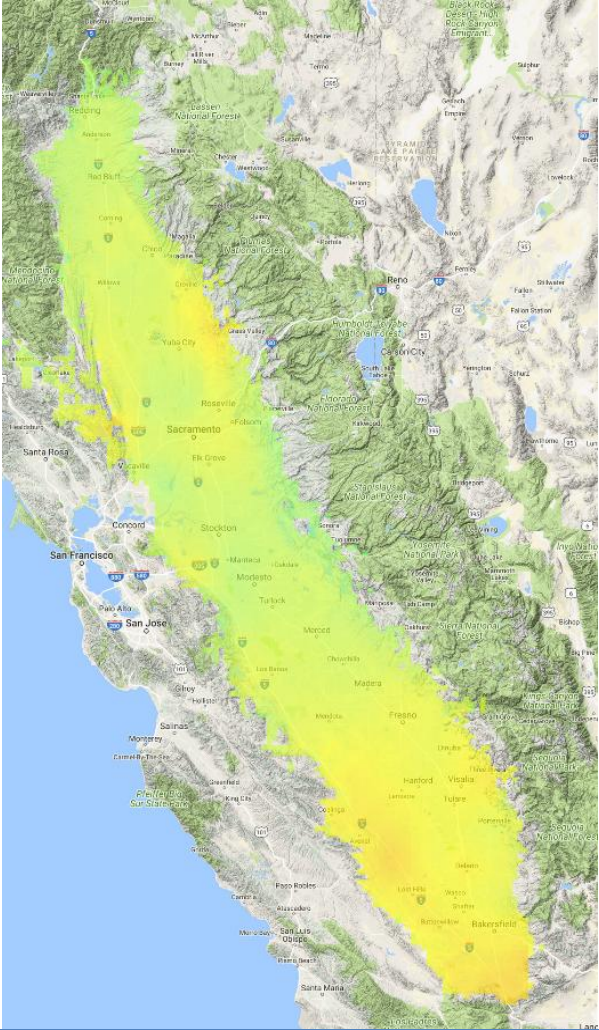
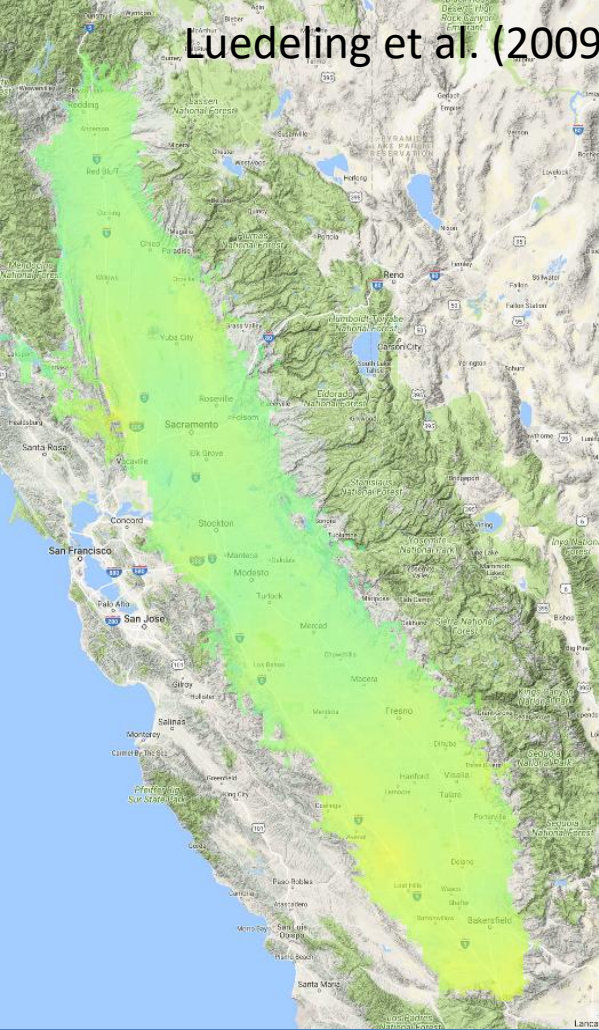
64

51 (↓ 20%)

42 (↓ 35%)

Chandler
needs
~ 60 chill
portions

Luedeling et al. (2009)



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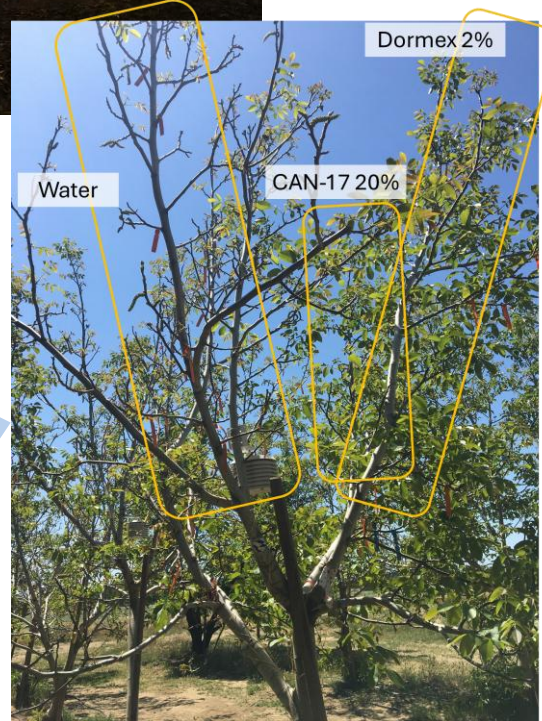
64

51 (↓ 20%)

42 (↓ 35%)

How can we help trees wake up normally after low chill winters?

Heated trees trials to narrow dormancy breaking treatments



Grower-scale trials with top performers

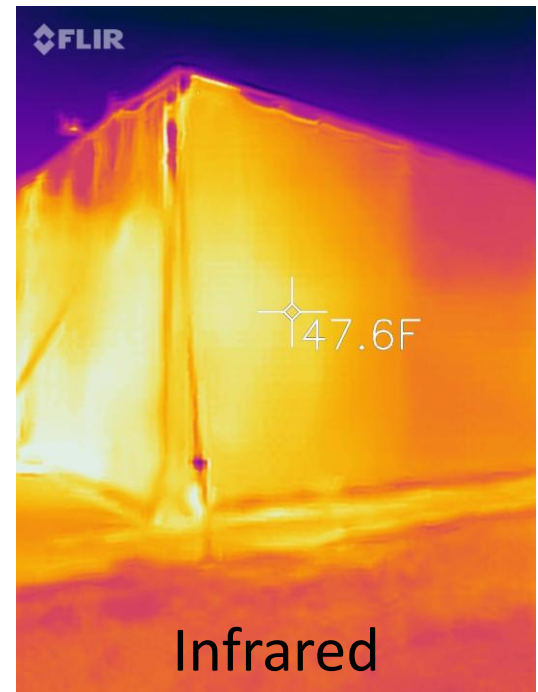
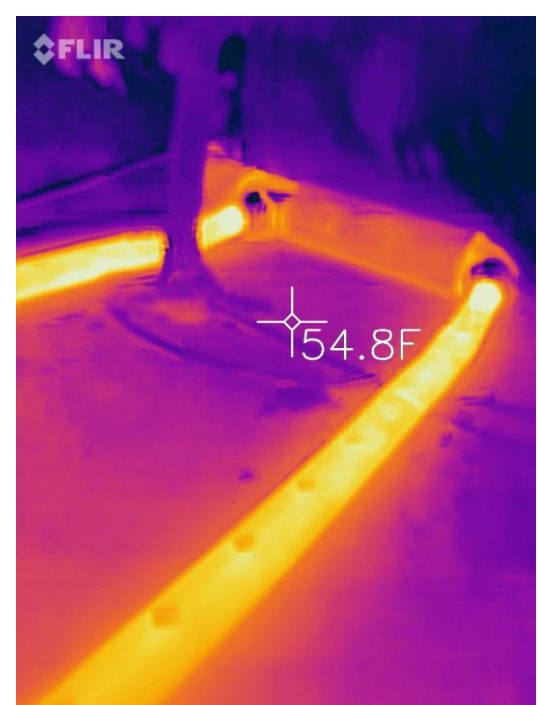


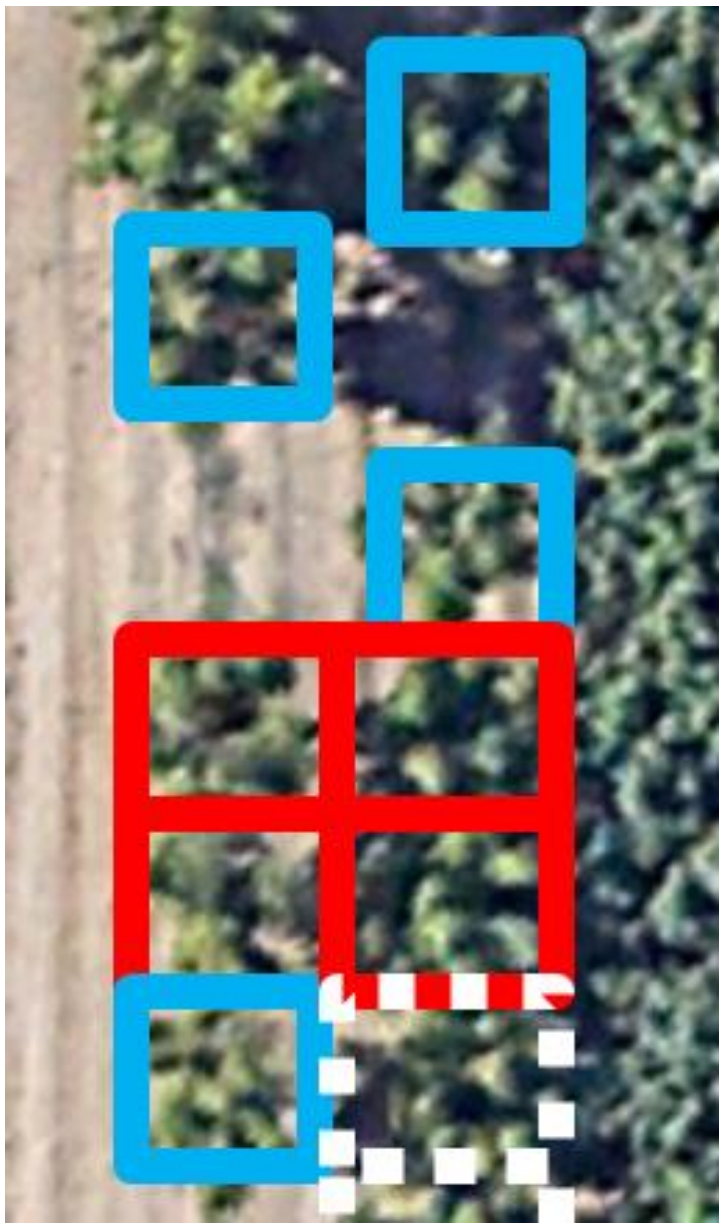
Dormancy Breaker Take-Aways So Far

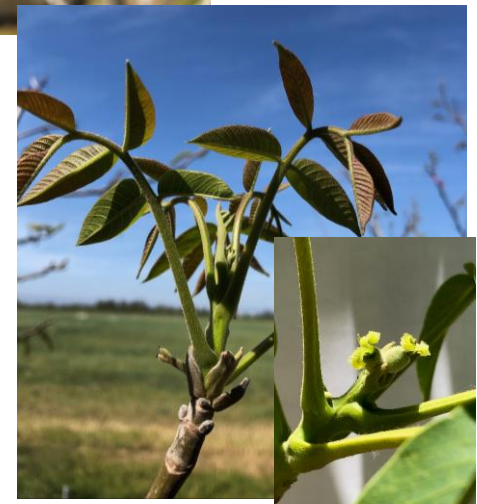
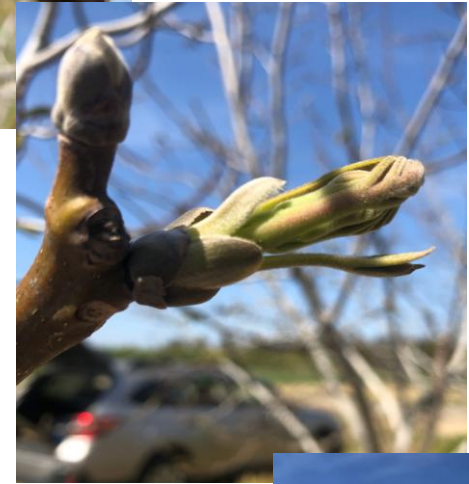
- Good tools in the toolbox – CAN-17 and Dormex® (Hydrogen Cyanamide)
- Likely not for every orchard every year.
 - After optimal chill winters in thriving orchard - Unlikely to warrant the cost in the long run.
- Likely still valuable tools following low and medium chill winters.
- Potential for encouraging additional budbreak in stagnant orchards.
- Exciting potential for moving harvest timing for growers with a lot of Chandler acreage.



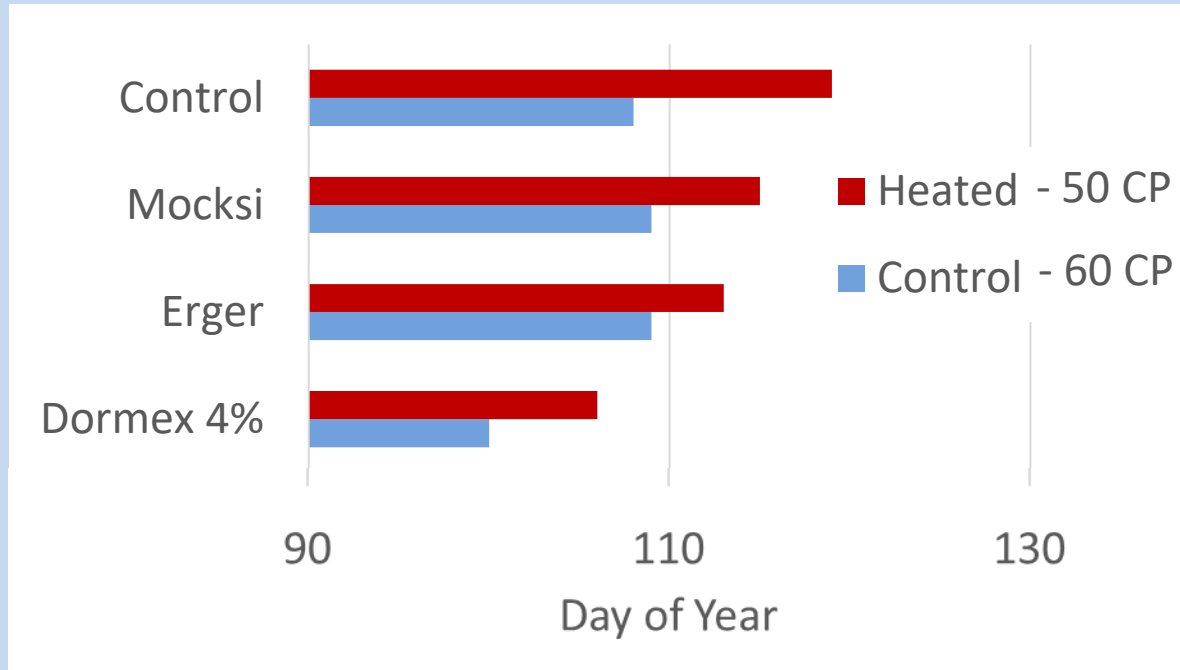
Heated Open Top Simulated Temperature Upshift in the Field
HOT STUF



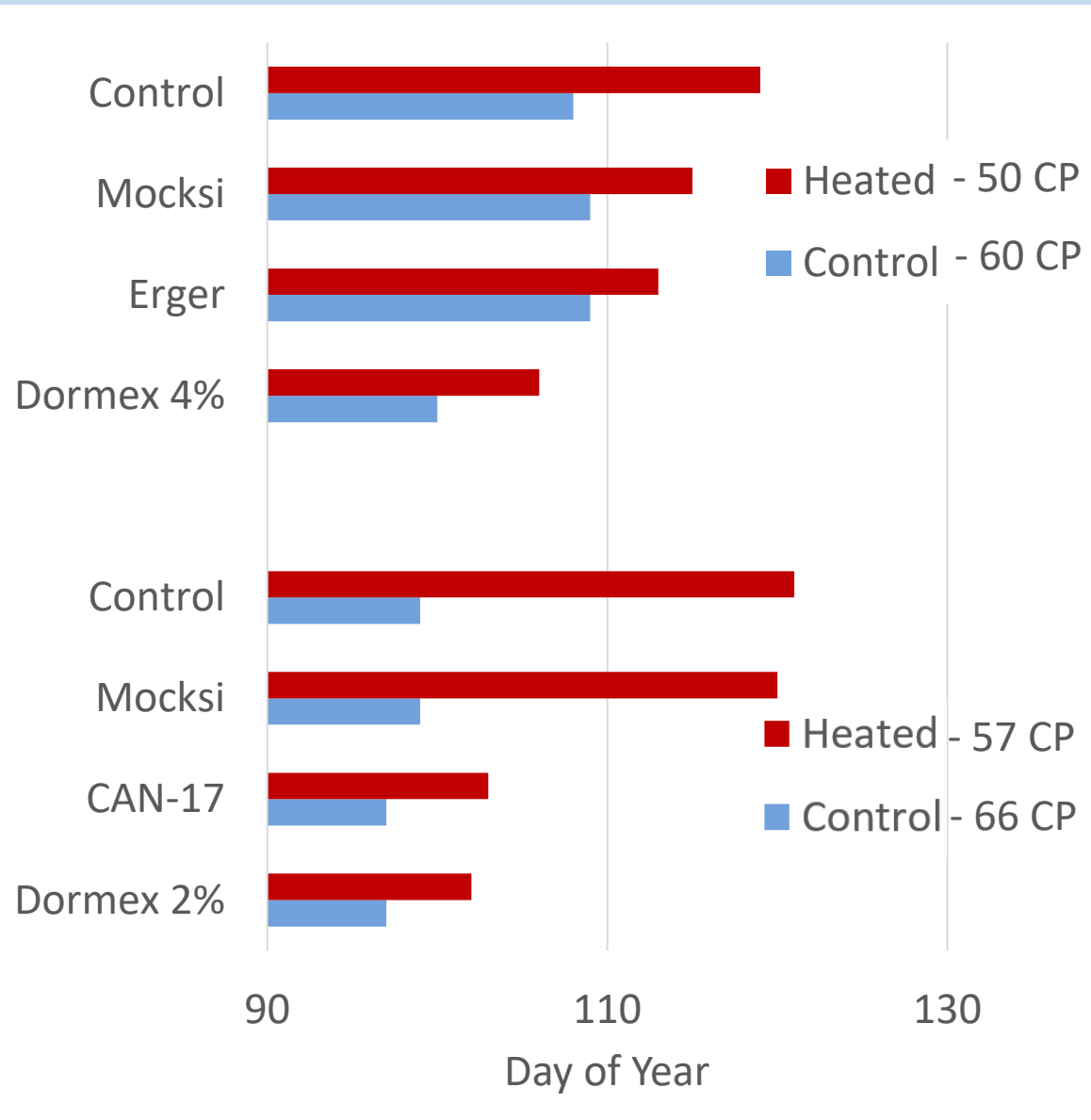




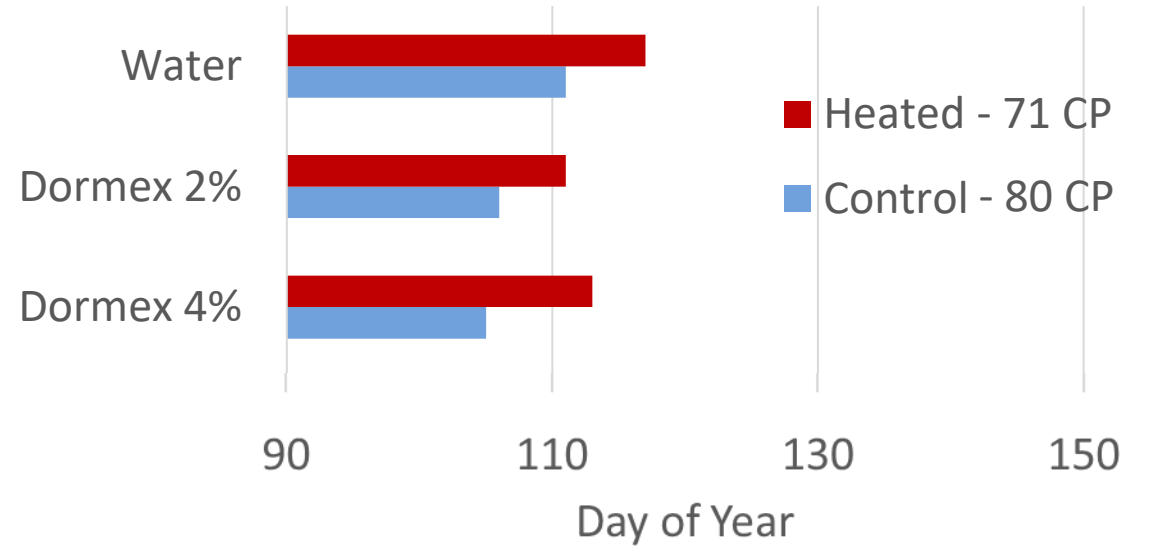
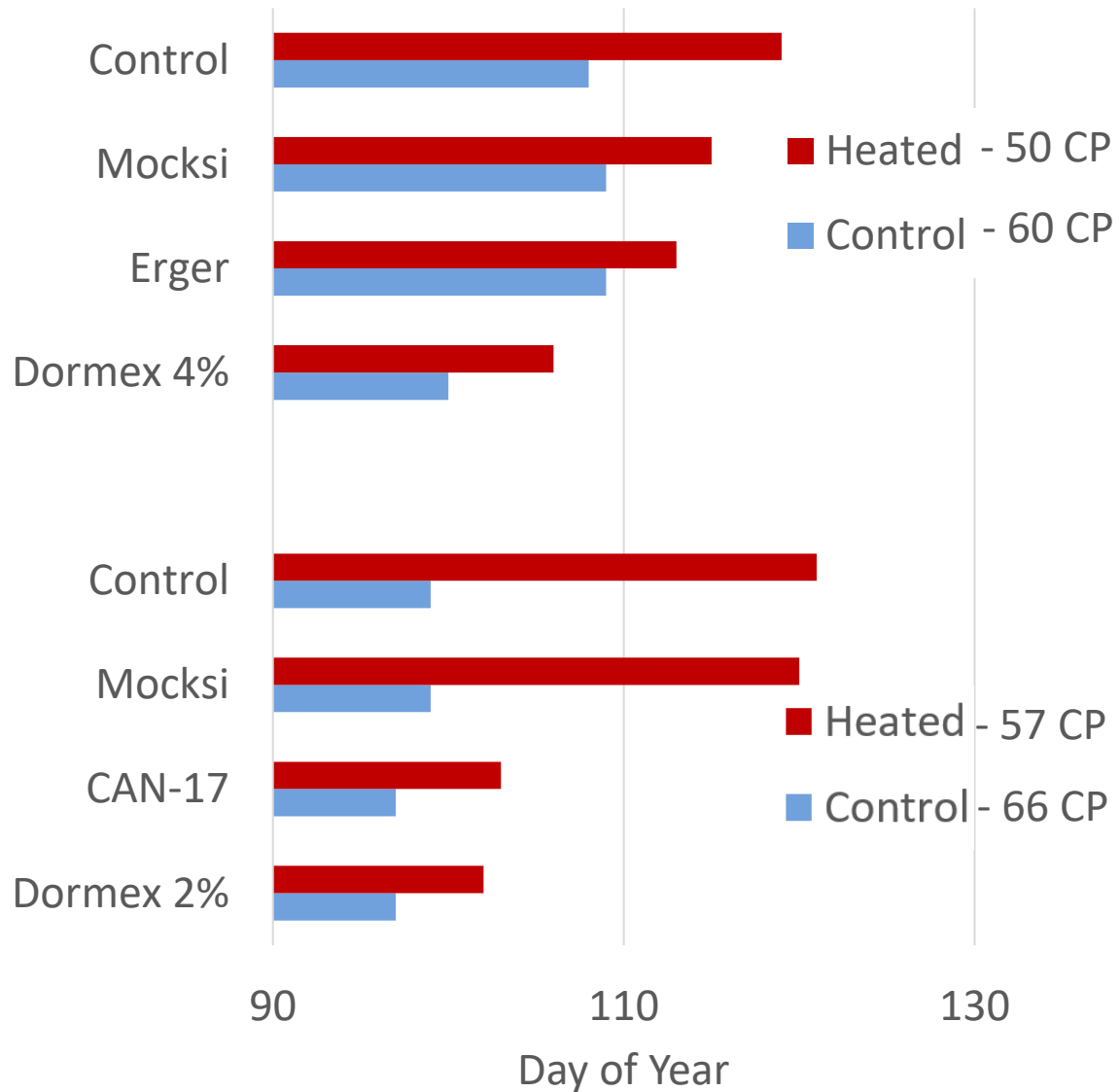
Change in Budbreak Timing



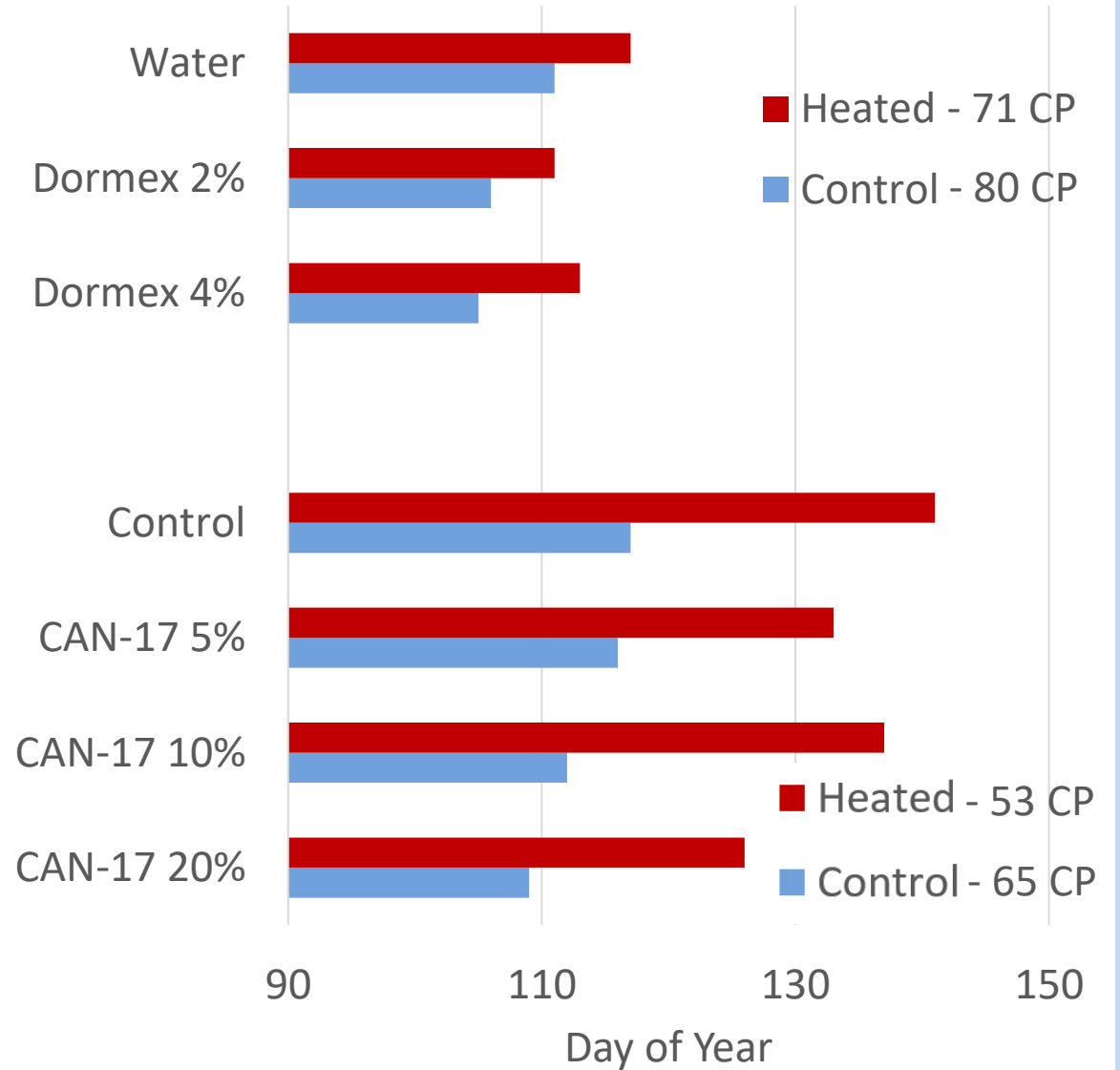
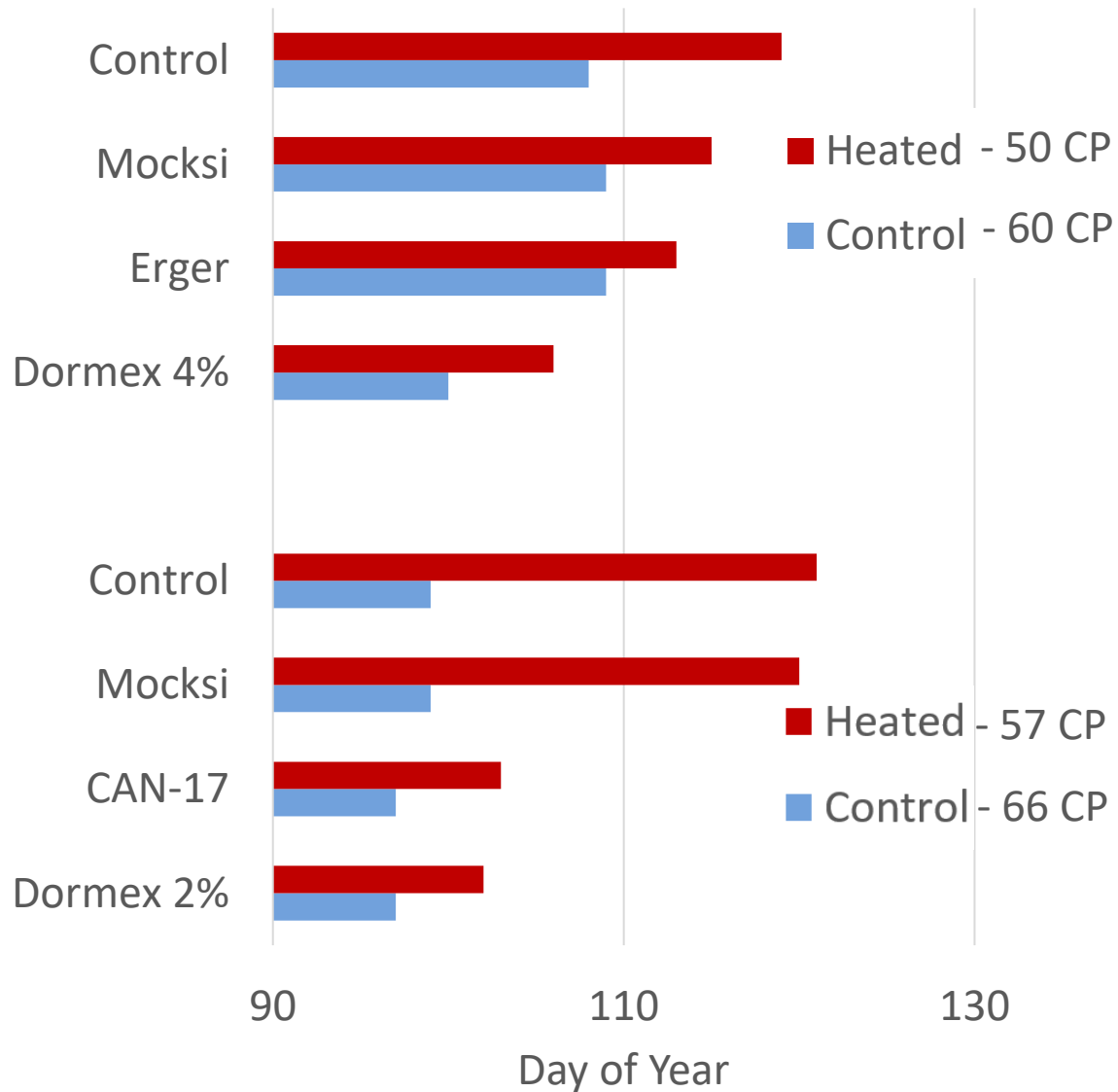
Change in Budbreak Timing



Change in Budbreak Timing



Change in Budbreak Timing



HOT STUF Take-Aways

MOCKSI

Little to
no effect

ERGER

Effective,
though not as
effective as
Dormex 4%

DORMEX

Very effective.

2% vs. 4%
No difference
in a high chill
winter

CAN-17

20% = As
effective as
Dormex 2%

5% & 10% =
Too low

Production Orchard Sites



Glenn County
10th Leaf (2023)
cv. Chandler



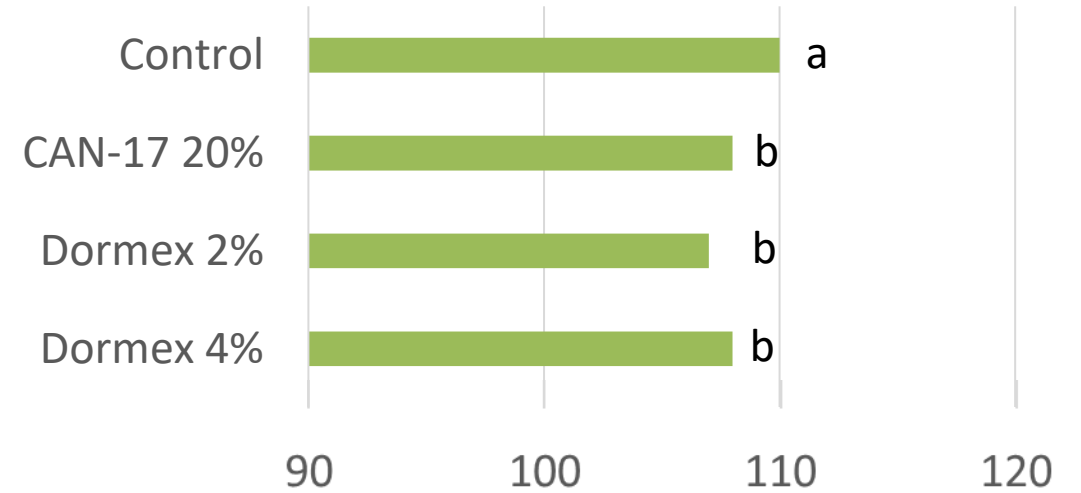
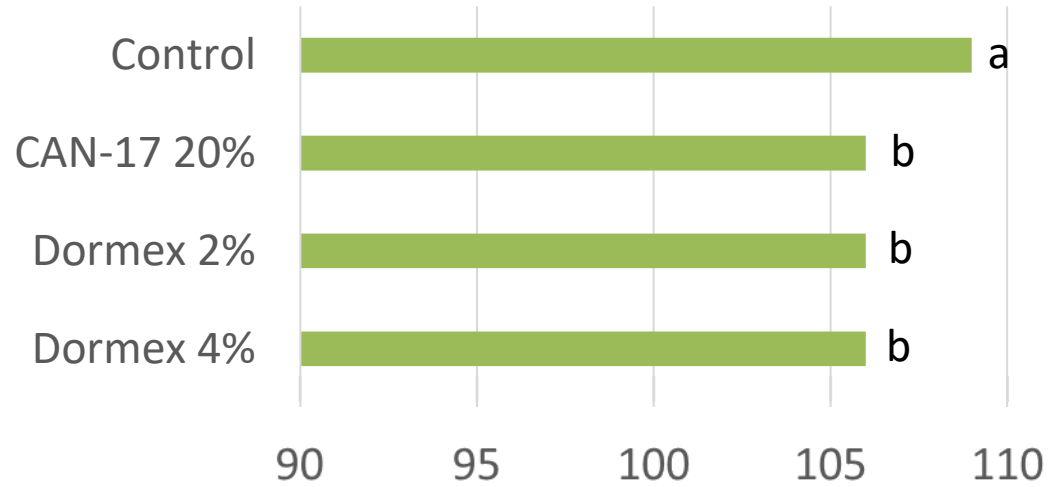
Nickels Soils Lab
16th Leaf (2023)
cv. Chandler

50% Budbreak Timing

Glenn

Arbuckle

2023

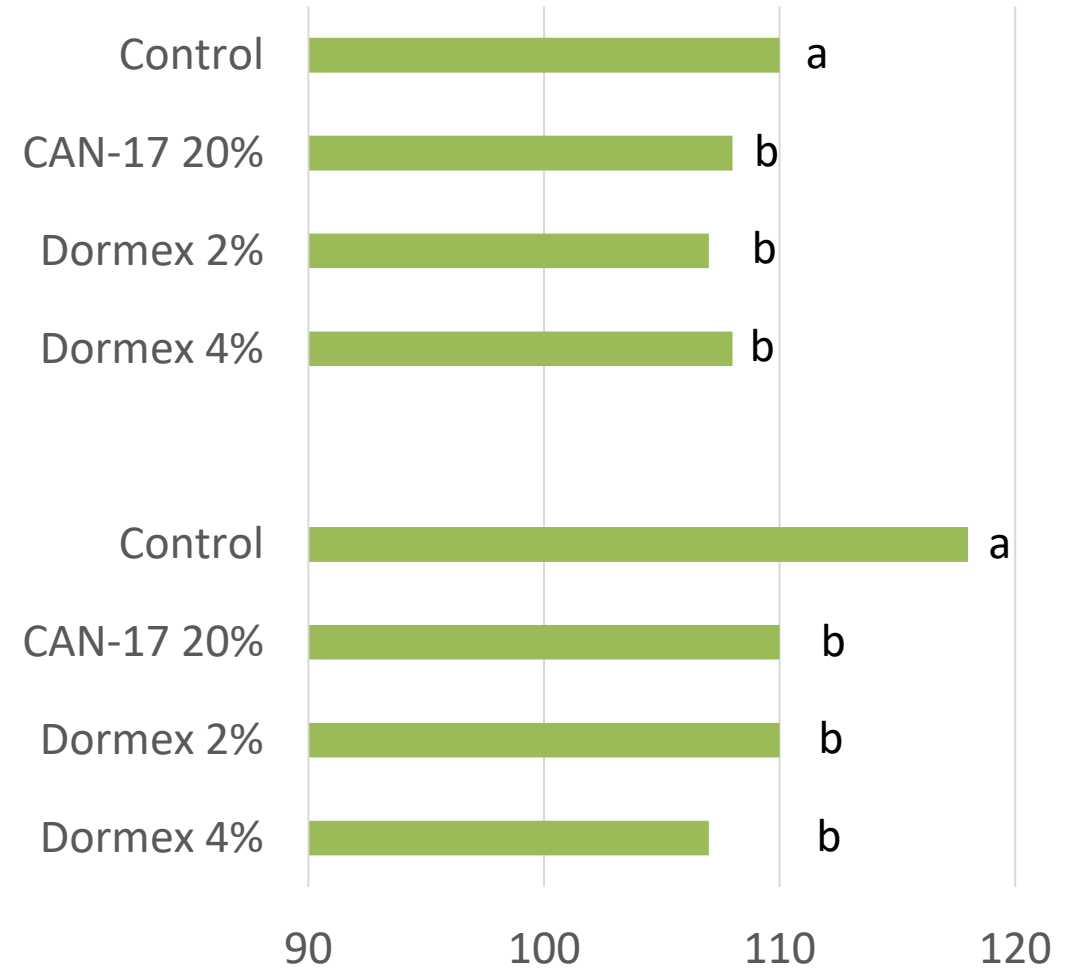
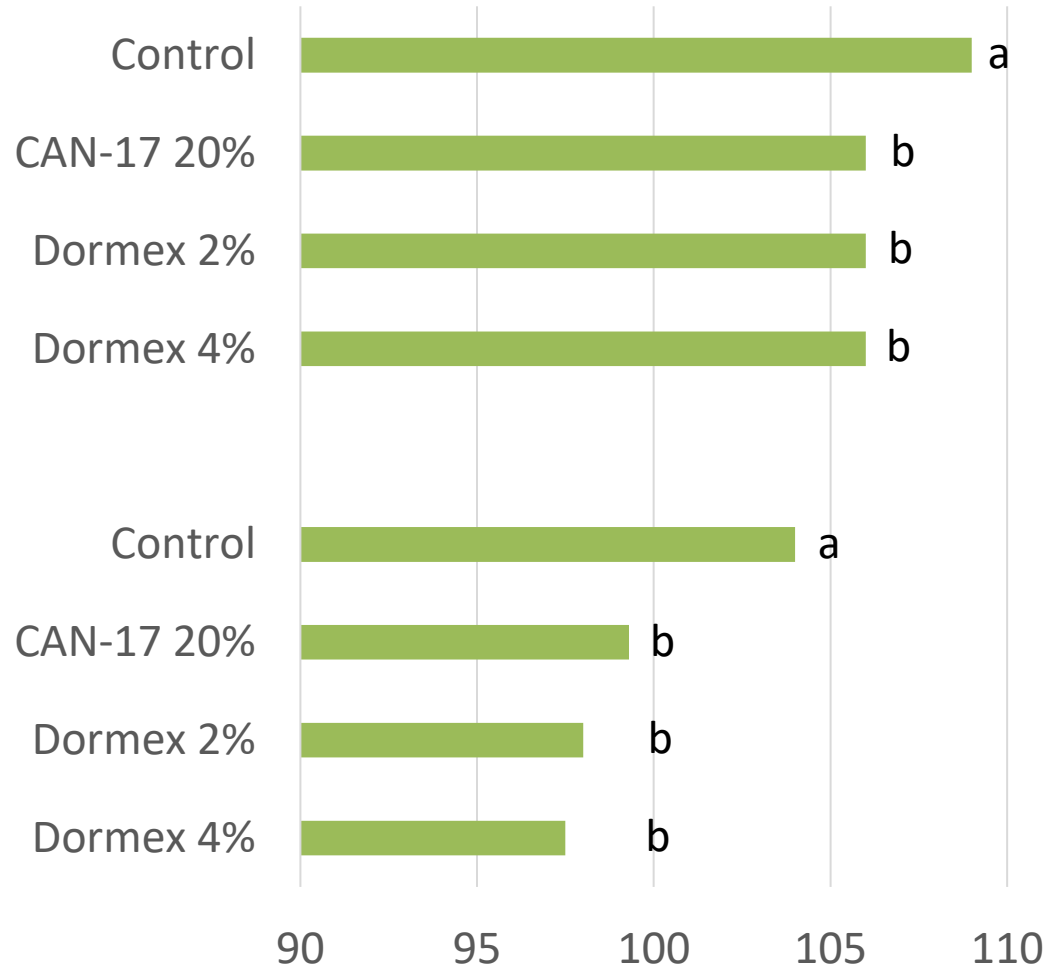


50% Budbreak Timing

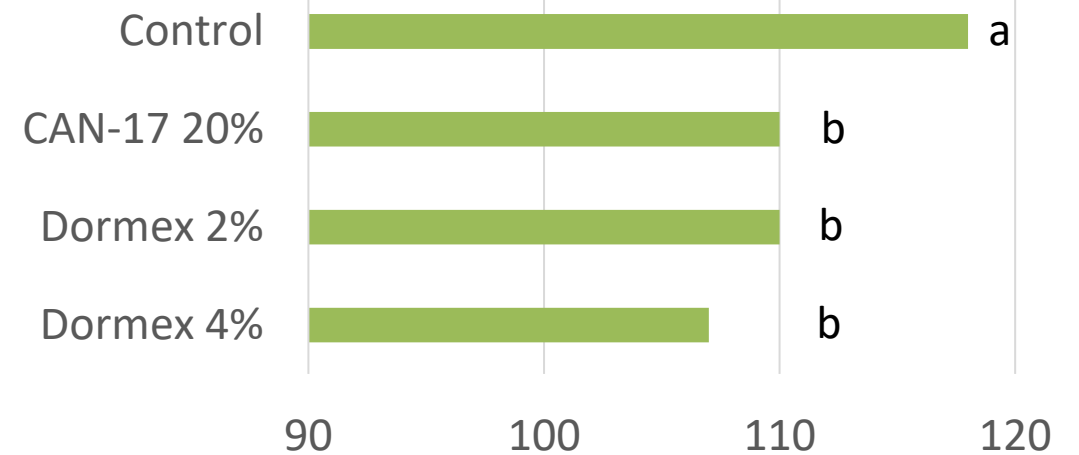
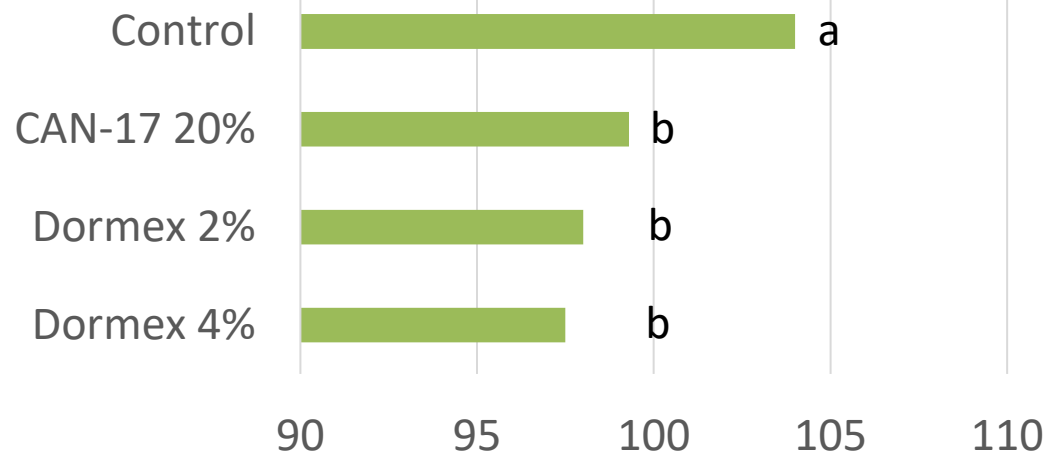
Glenn

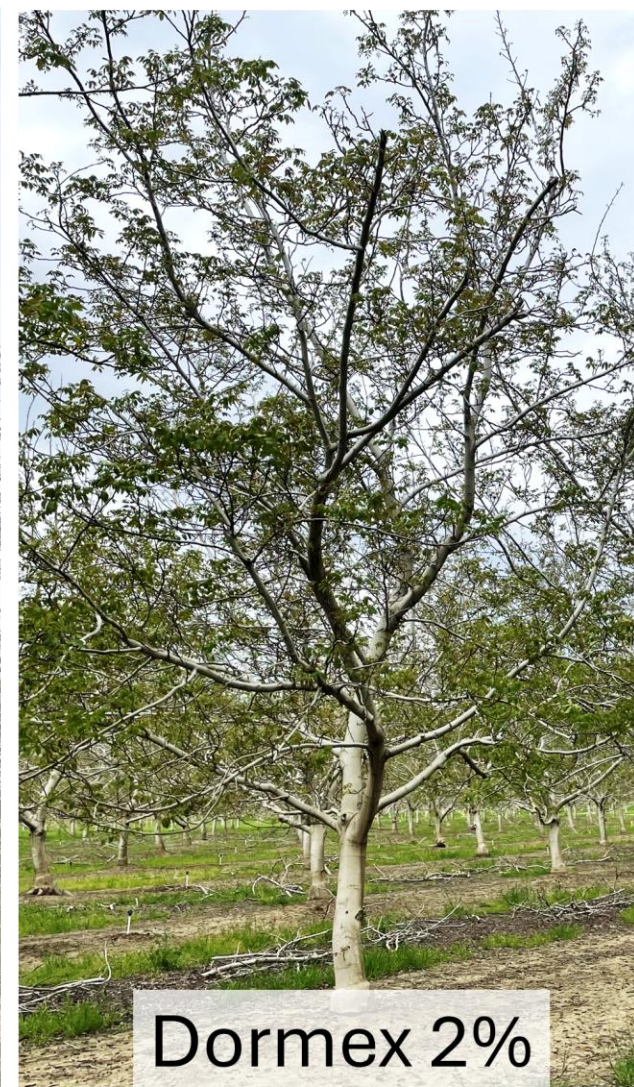
Arbuckle

2023



2024





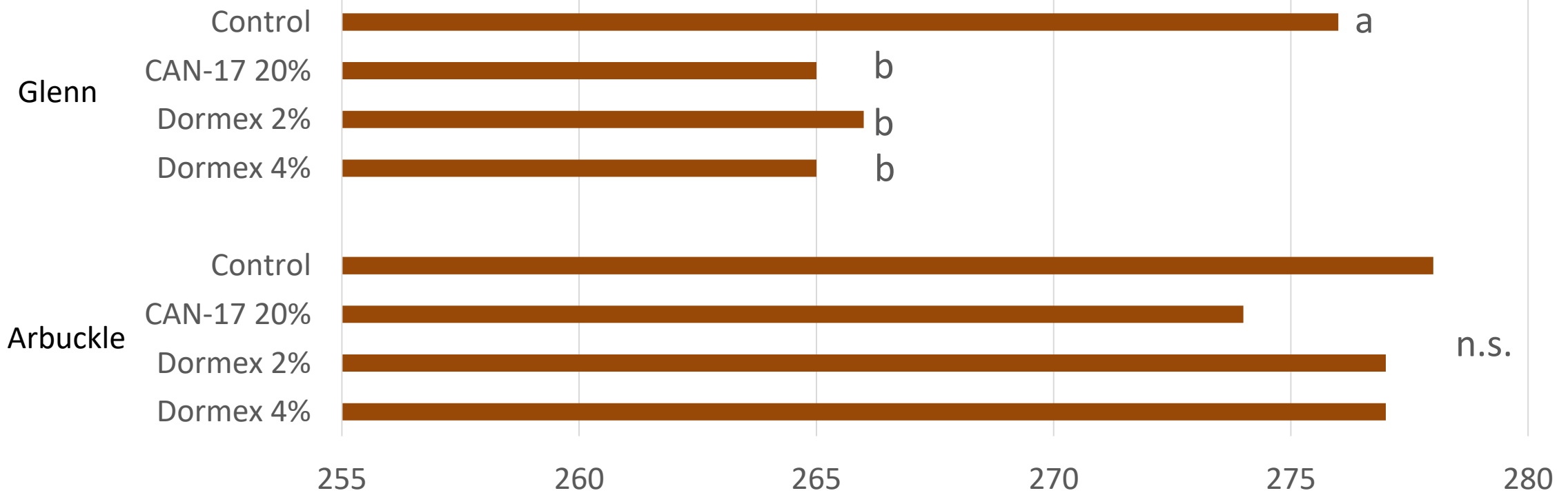


Control

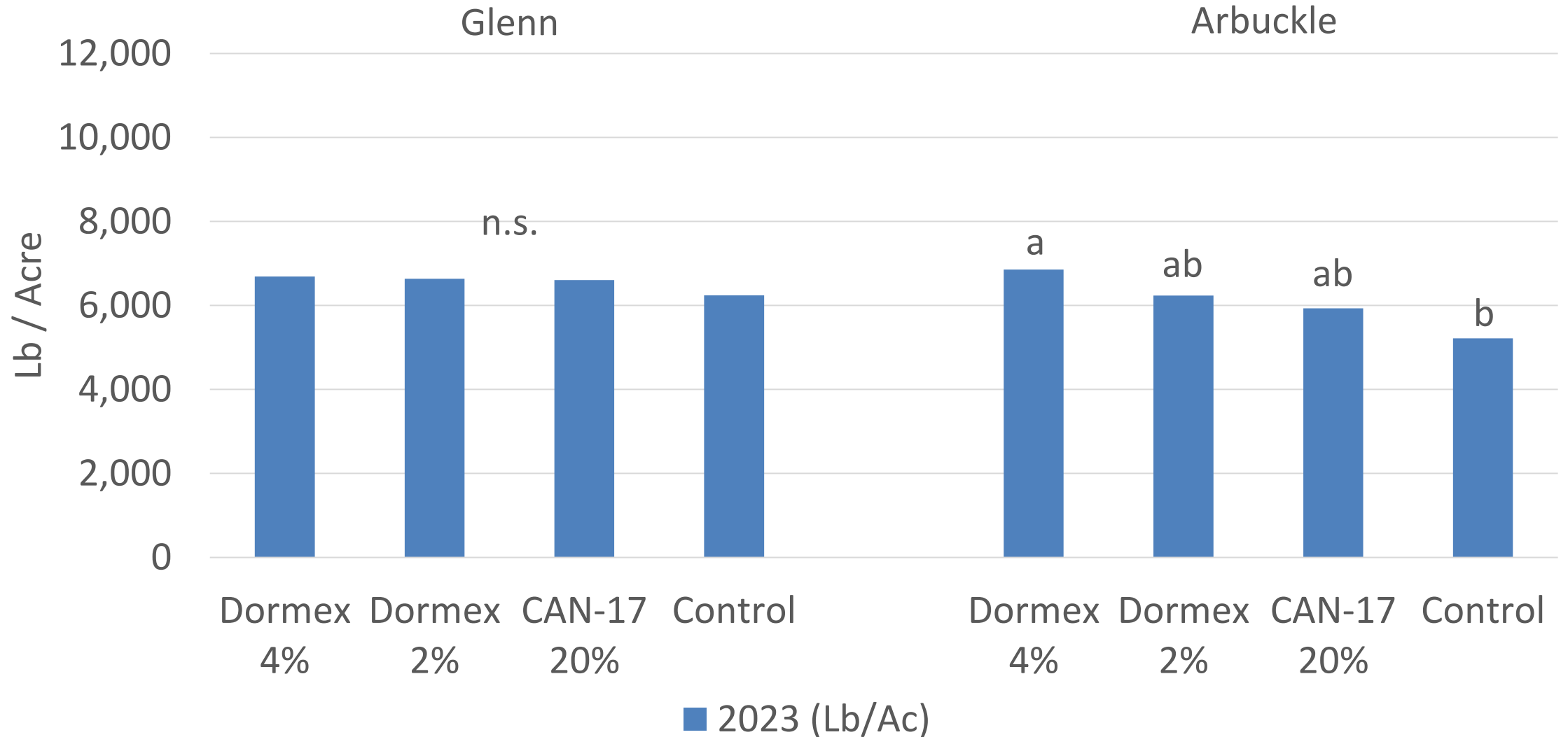
Dormex 2%

Sometimes earlier PTB

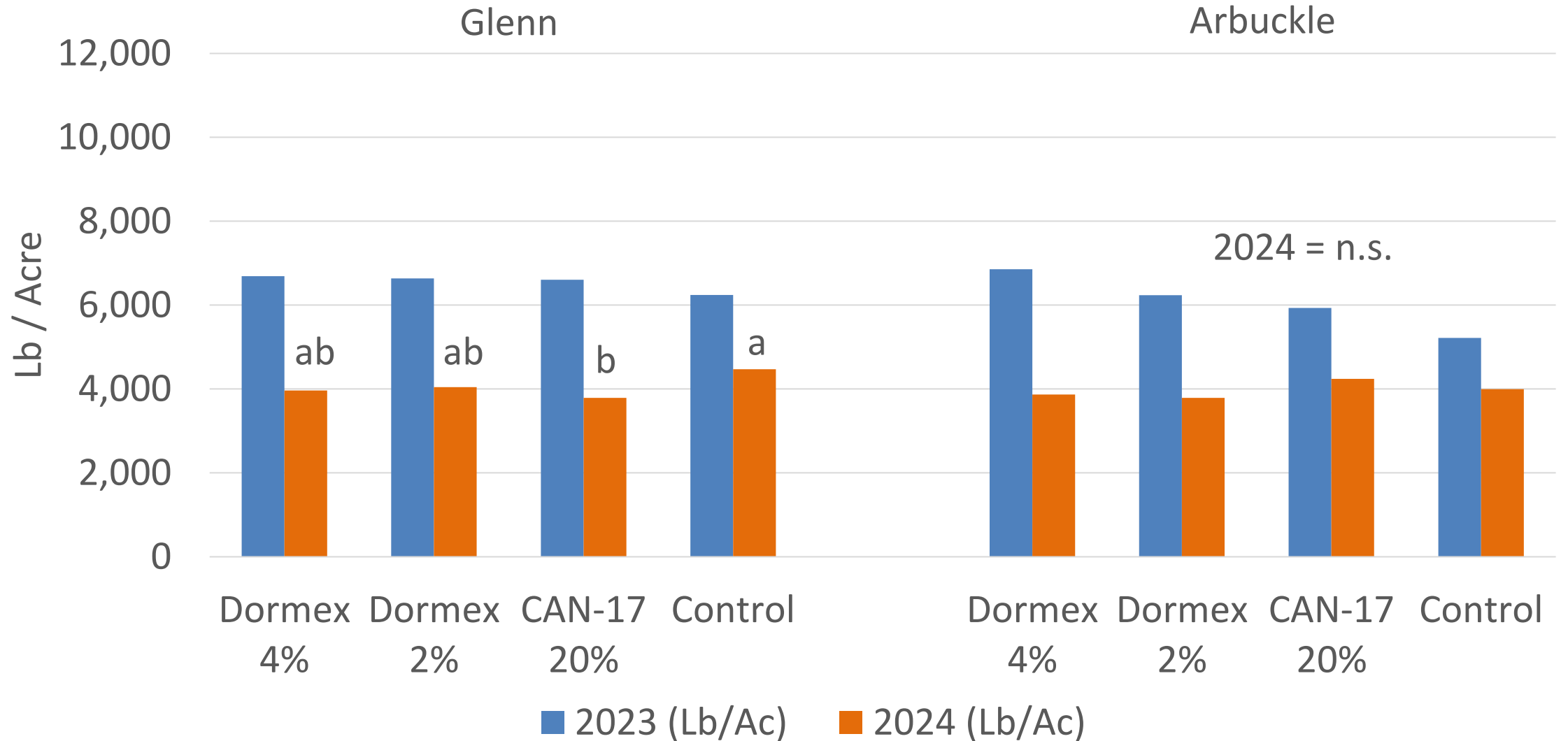
PTB 100% (DOY)



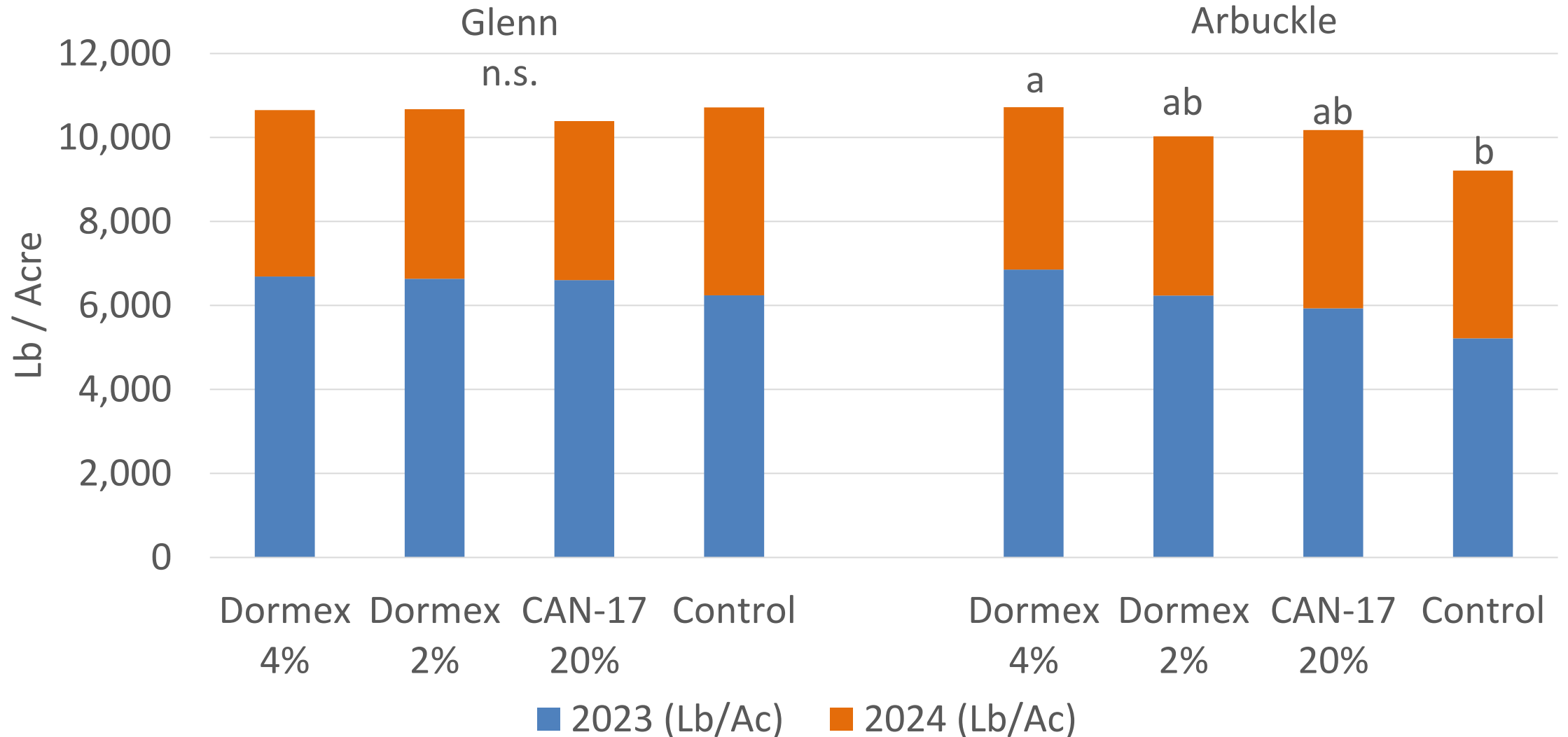
Yield - 2023



Yield - 2024



Yield - Cumulative



Dormancy Breaker Take-Aways So Far

- These tools likely not for every orchard every year.
- So far, Dormex at 4% likely rarely worth the additional cost vs. 2%.
- In other countries, 1.5% more common rate in mature trees (lower in younger trees).
- After optimal chill winters (e.g. 2022-2023) to thriving orchard (e.g. Glenn) unlikely to warrant the cost in the long run.
- Likely still valuable tools following low and medium chill winters.
- Potential for encouraging additional budbreak in stagnant orchards (Arbuckle).
- Exciting potential for moving harvest timing for growers with a lot of Chandler acreage.



Please rate your knowledge level regarding
DORMANCY BREAKING TREATMENTS FOR
WALNUTS...

...BEFORE this meeting.



- ☐ No Knowledge
- ☐ Some Knowledge
- ☐ Fairly Knowledgeable
- ☐ Very Knowledgeable
- ☐ Extremely Knowledgeable

...AFTER this meeting.



Do you intend to use any of the dormancy breaking
treatments discussed today in the next 2-3 years?

- ☐ Yes



Thank you!



BIG THANKS to
Crain Walnuts, Nickels Soils Lab
Brad Hanson & Seth Watkins
Dave Cripe
Duarte Nursery
Becky, Jamie, Clarissa & Franz
SRAs Adela & Mat