Innovative solutions to improve winter chill accumulation and dormancy breaking in California Cherry orchards

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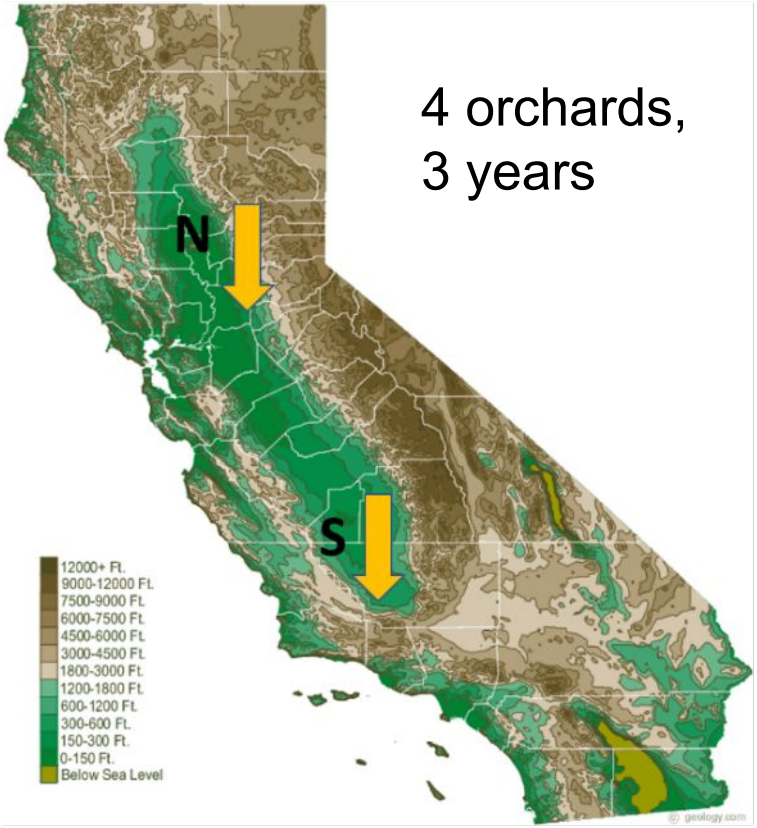
Report 2026/2027

California Cherry Board

Objectives:

1. Improve the efficacy of dormancy-breaking agent applications by optimizing application timing
    - Climate change
    - New varieties
    - Regulations
2. Using tree-based information of dormancy progression and chill accumulation

Phase 1: develop a new framework for chill accumulation in California cherry



Historical chill portion (CP) accumulation: 70 (S) – 80 (N)

Measurements:

- Tree bark temperature
- Phenology (bloom and senescence)
- weather parameter
- Twigs non-structural carbohydrates (NS): starch and sugars in wood and bark

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The TreeChill model: A new framework for predicting the impact of erratic winter weather on trees

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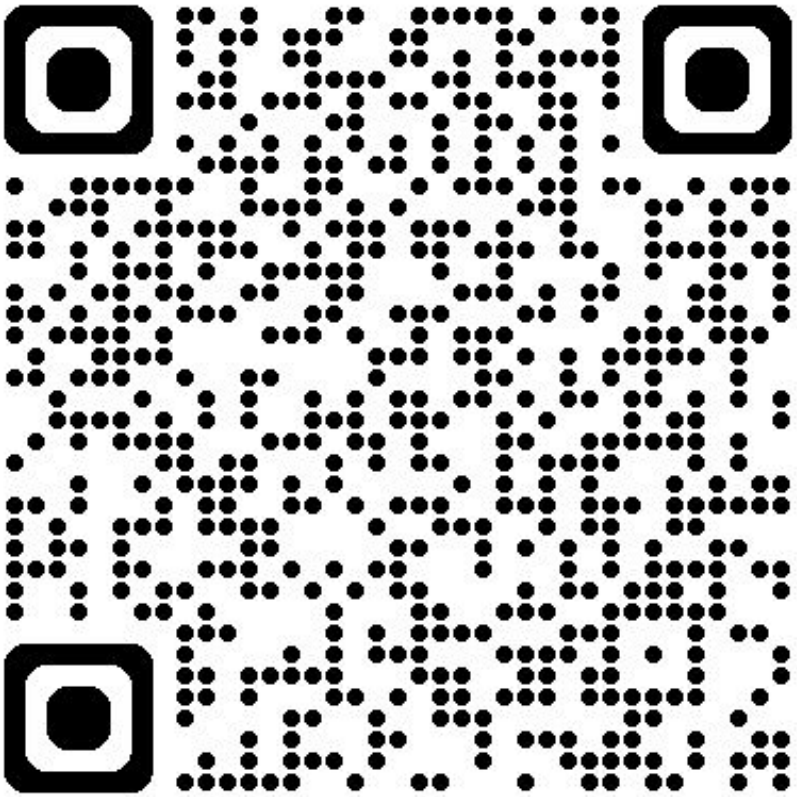
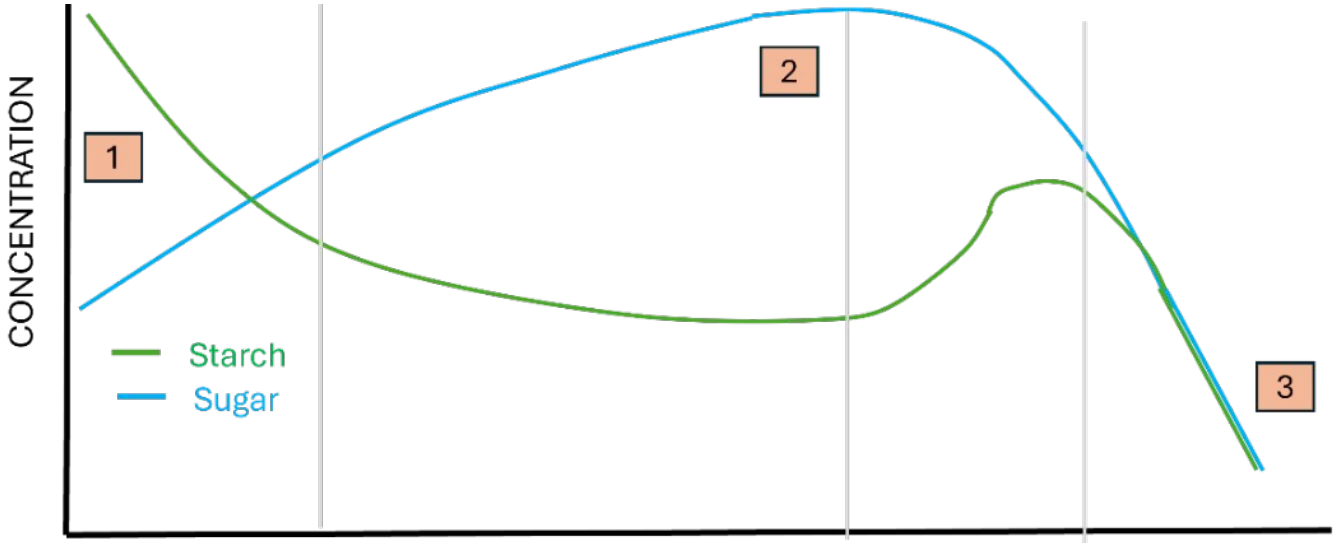
Online TreeChill calculator for Cherry:



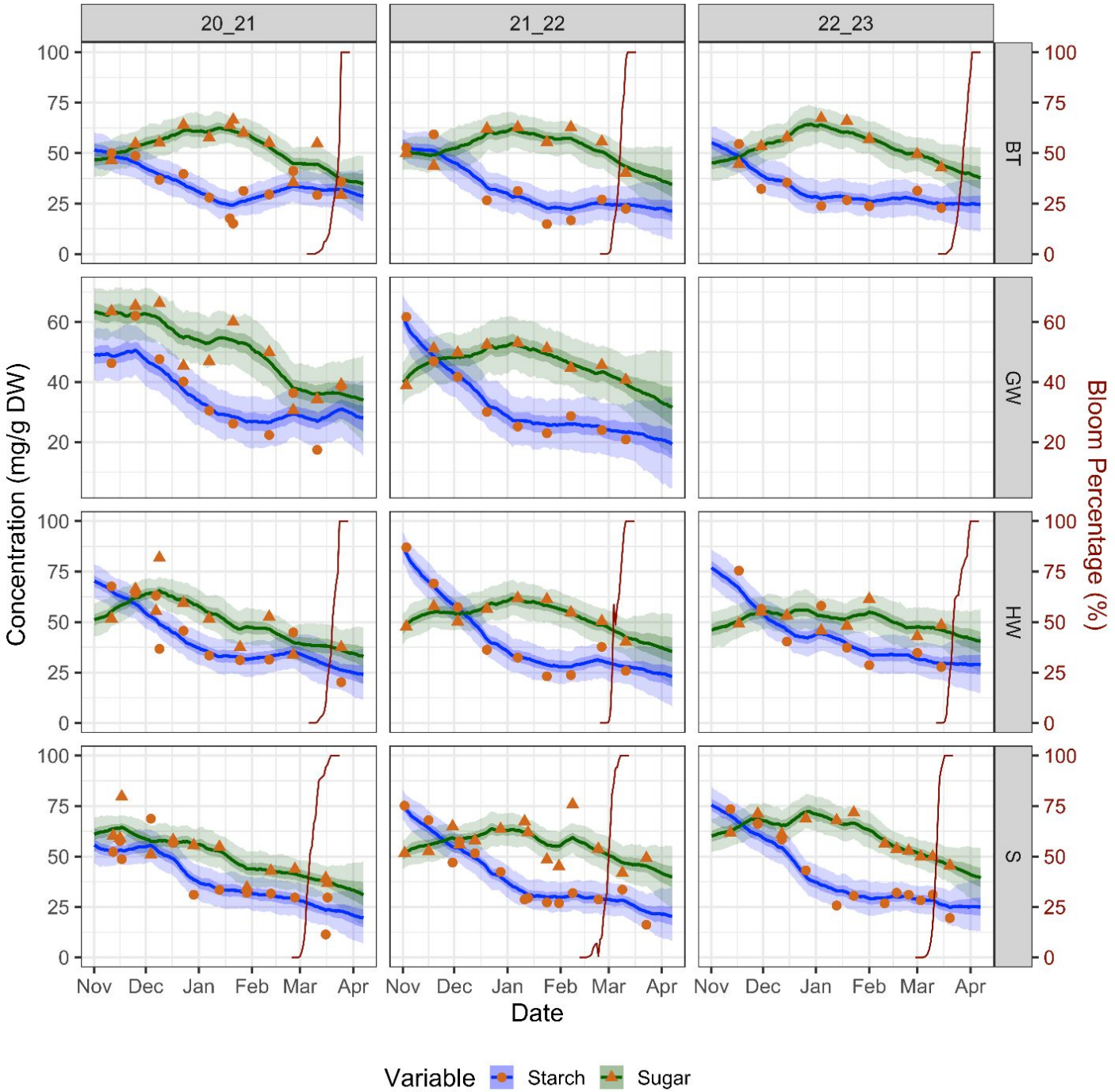
First year running we strongly welcome feedbacks!

- **Cherry Chill R Package (to be published before sharing)**
- **Cherry Chill Shiny App:** https://ucanr-igis.shinyapps.io/cherrychill/
- **Cleaned CIMIS Dashboard:** https://ucanr-igis.shinyapps.io/cleancimis_stats/

NSC Dynamics used to characterize dormancy progression



	WINTER PROGRESSION		
Paradormancy	Endodormancy	Ecodormancy	Bloom
Sugar	Sugar	Sugar	Sugar
Starch	Starch	Starch	Starch

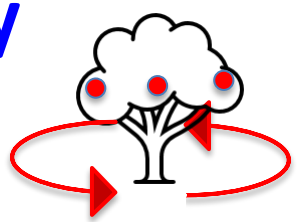

20_21
21_22
22_23
BT
GW
HW
S
Concentration (mg/g DW)
Bloom Percentage (%)
Nov
Dec
Jan
Feb
Mar
Apr
Date
Variable
Starch
Sugar

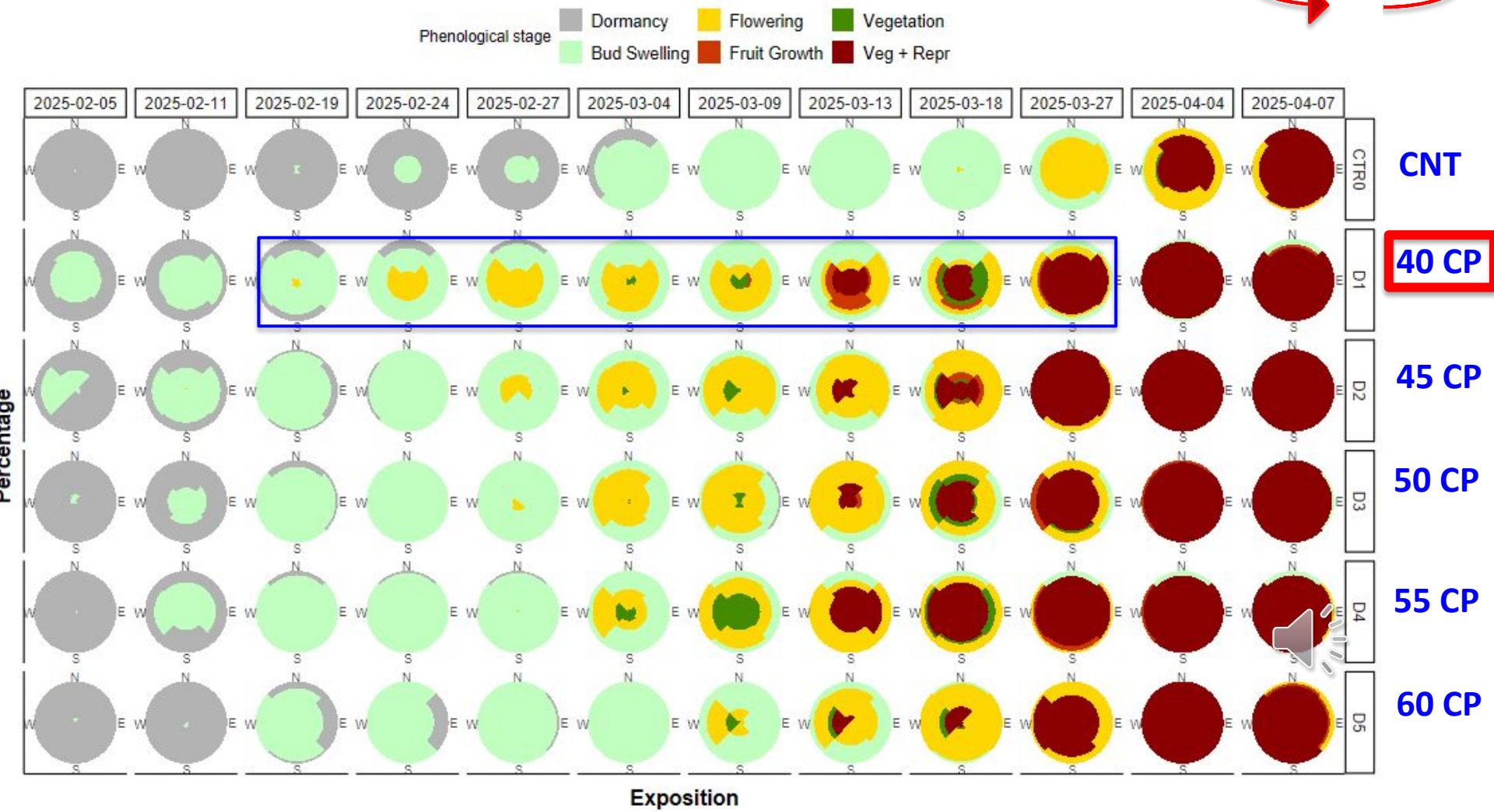
Phase 2- apply dormancy breaking agents based on the new framework – Year 1 = Dormex

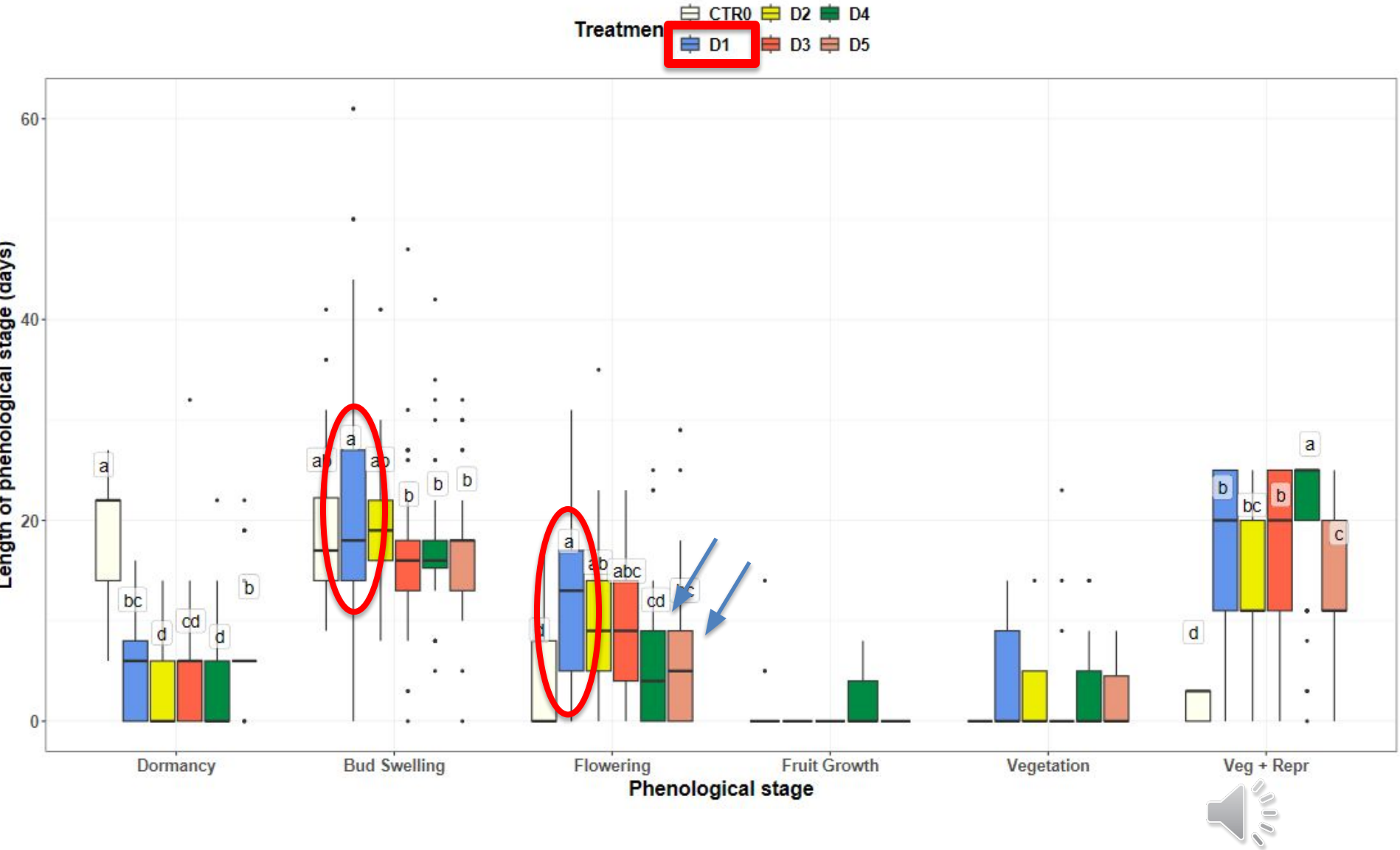
Treatment	Spray date	Air Chill portions	Tree Chill portions
D1	January 6	40	35
D2	January 14	45	40
D3	January 21	50	44
D4	January 28	55	48
D5	February 5	60	52
CTR	-	-	-

Objective 1 – Year 1 results for Dormex application

Bloom variability across tree canopy



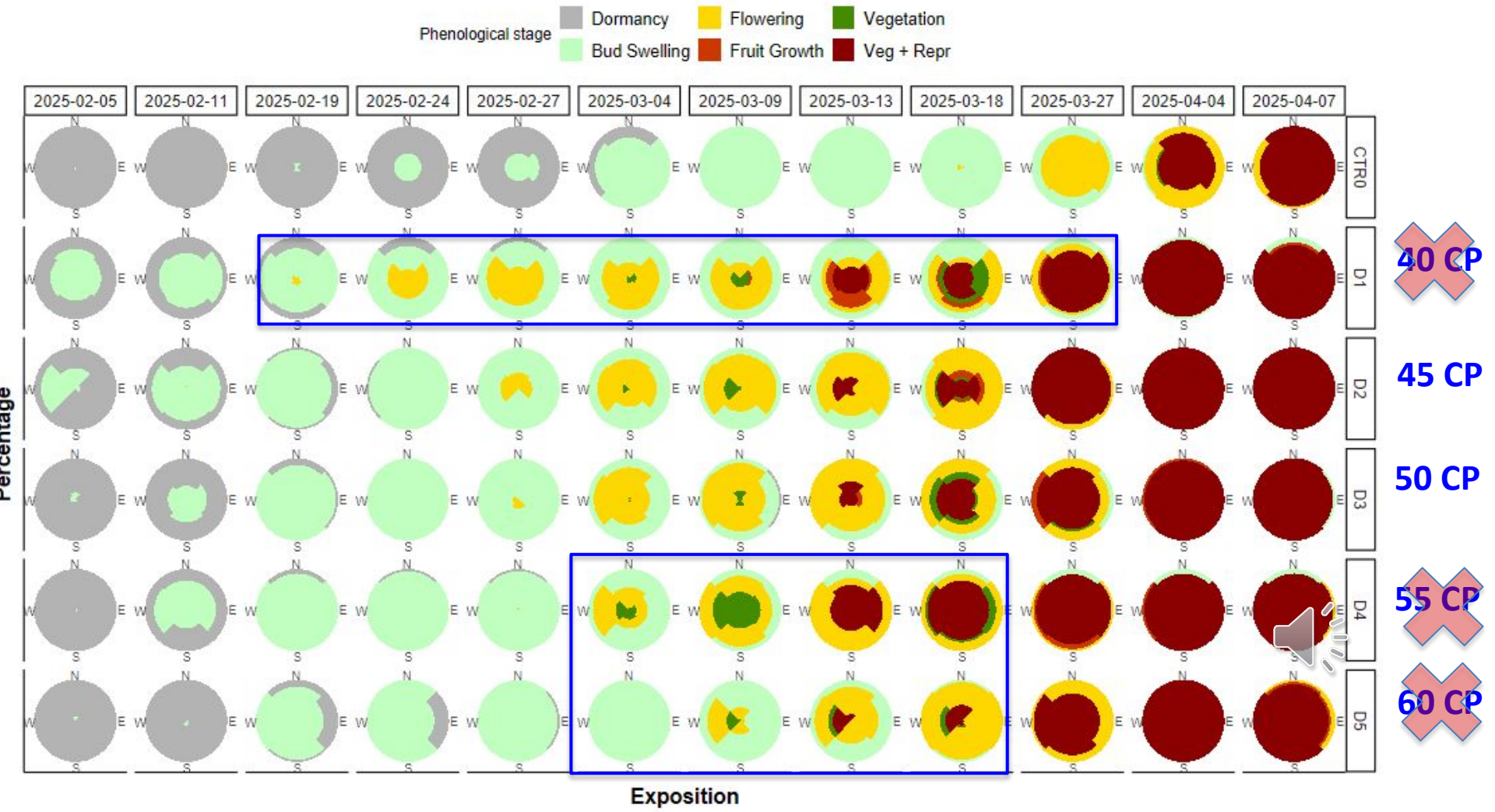


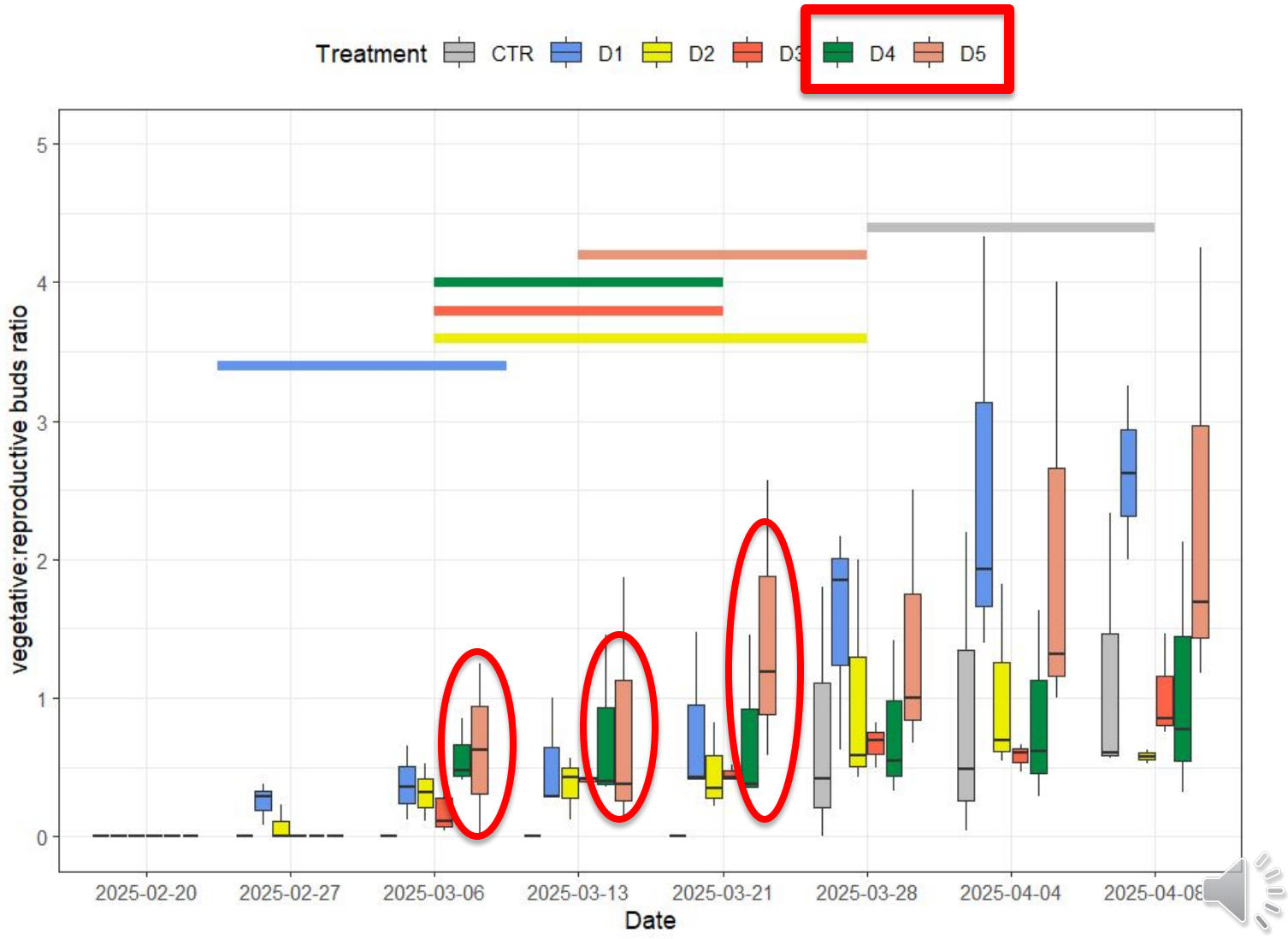


D1 (40 CP) had the earliest but most protracted bloom

D4 and D5 (55 and 60 CP) had very compacted bloom

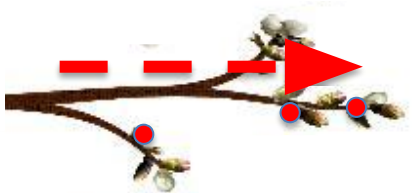
Bloom variability across tree canopy

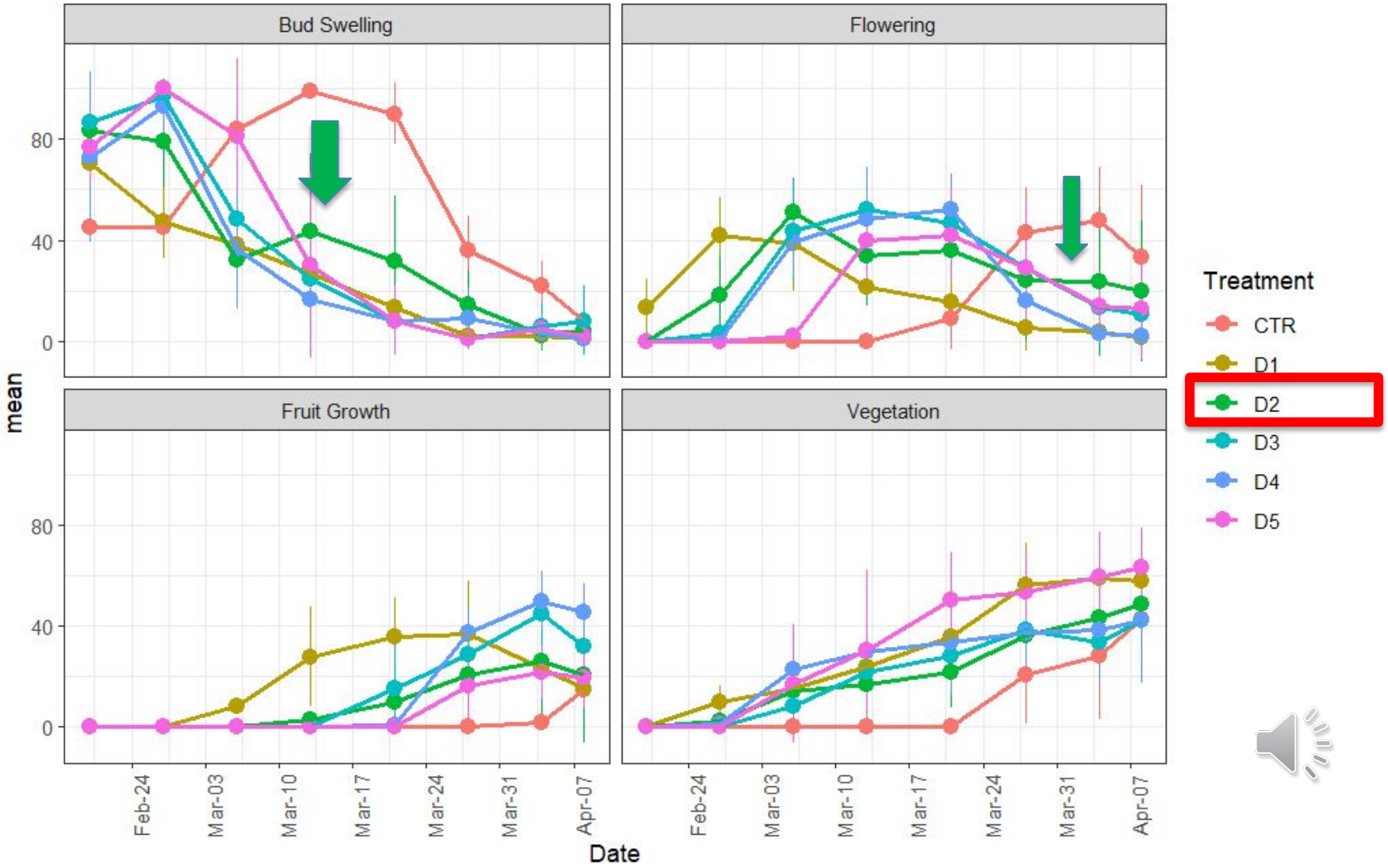




D4 and D5 (55 and 60 CP) had higher vegetative growth during early bloom
D3 (50 CP) had the lowest vegetative growth during early bloom

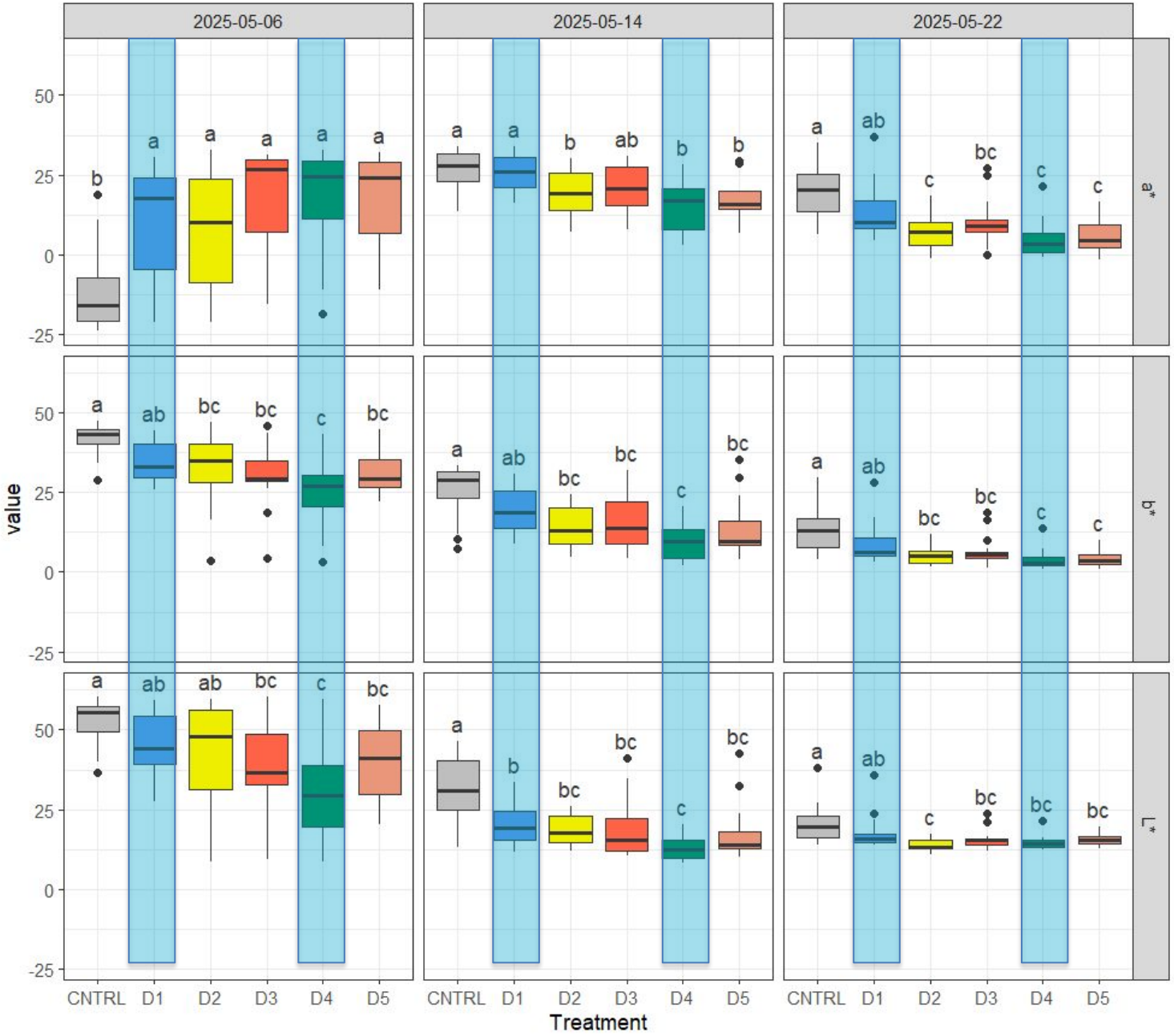
Bloom variability within branch



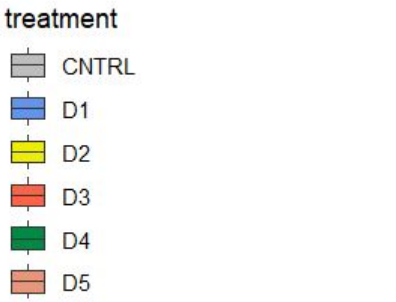


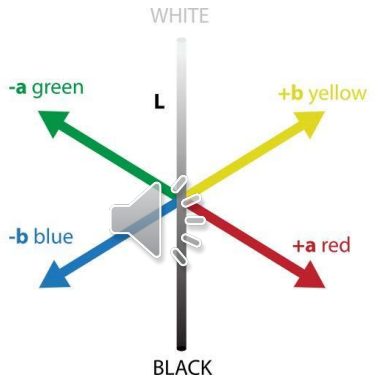
D2 (45 CP) had a spread full bloom

Fruit ripening progression



Red-green





Summary

		February			March				April	
		week 2	week 3	week 4	week 1	week 2	week 3	week 4	week 1	week 2
X	D1			Feb 27						
X	D2					Mar 9				
V	D3						Mar 17			
X	D4						Mar 17			
X	D5						Mar 17			
	CNTR								Apr 4	

Treatment	Spray date	Air Chill portions	Tree Chill portions
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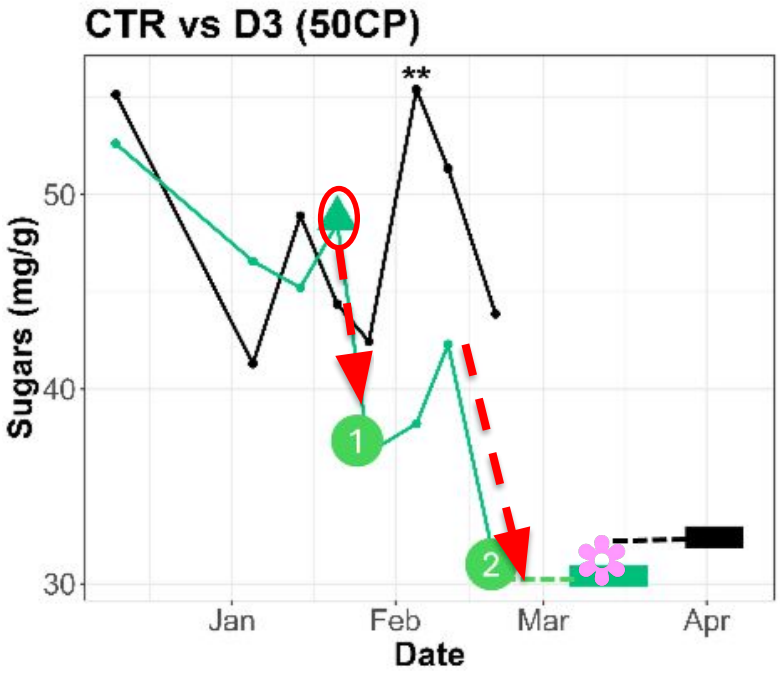
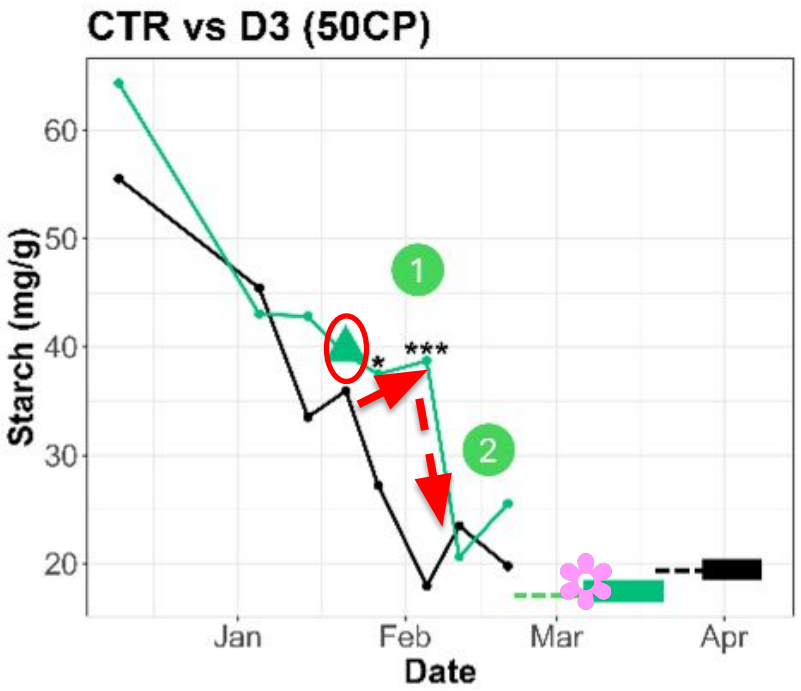
CTR	-	-	-

Dormex impact on NSC





All spray times show a sugars decrease and a starch increase after application, similar to what observed in natural condition in our original statewide trial

Cultivars chill requirement characterization

	January		February			
	week 3	week 4	week 1	week 2	week 3	week 4
Royal Lee						
Royal Lynn						
Black Pearl						
Rainier						
Royal Hazel						
Coral						
Brooks						
Air Chill (CP)	40	46	50	51	60	60
Tree Chill (CP)	33	36	40	42	46	46

Thank for your support and trust

Questions, please.

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TREE SYSTEMS LAB

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