Continuous Monitoring of the Olive Fruit Growth

Presented by:

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23 September 2023
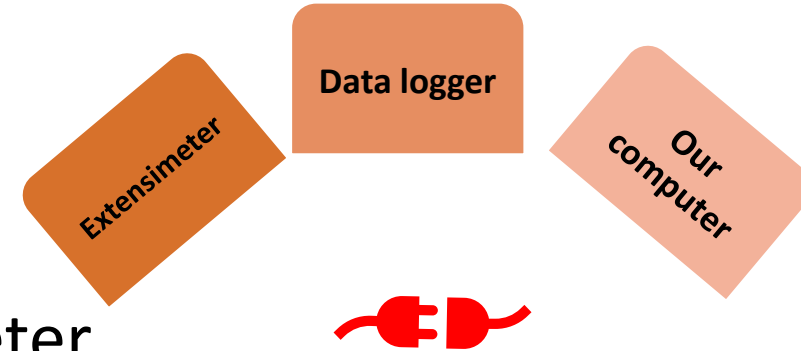
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AGRARIA
D3A - DIPARTIMENTO DI SCIENZE
AGRARIE, ALIMENTARI E AMBIENTALI

Introduction

- ✓ Repeated data collection at short intervals (from minutes up to an hour)
- ✓ Online observation of collected data in real-time

Real-time continuous olive fruit monitoring by extensimeter

- ✓ Synonym of fruit gauge/fruit dendrometer
- ✓ Proximal fruit-based sensor
- ✓ Measure fruit diameter

Extensimeter → Data logger → Our computer
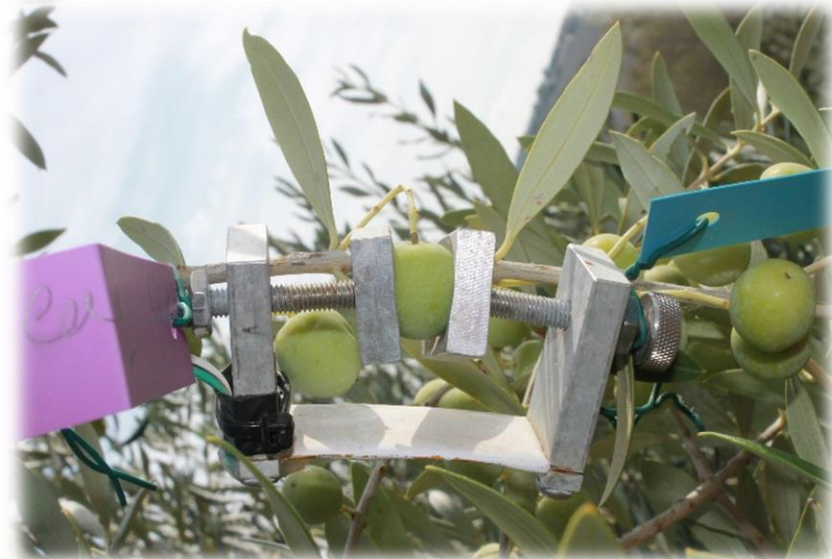
Continuous monitoring of olive fruit growth by extensimeter

|	
Cultivar	Piantone di Falerone, Lea, Ascolana dura, Arbequina
Tree age	9
Orchard	Highly intensive (4×2)
	Aguliano, Ancona, Italy
Extensimeter (Fruit gauge)	Strain gauge & LVDT
	DEX20, Winet
Temporal resolution	hourly
Year	2021
Irrigation treatment	Without (DI-0), DI-10 and DI-20
Growth phase	III

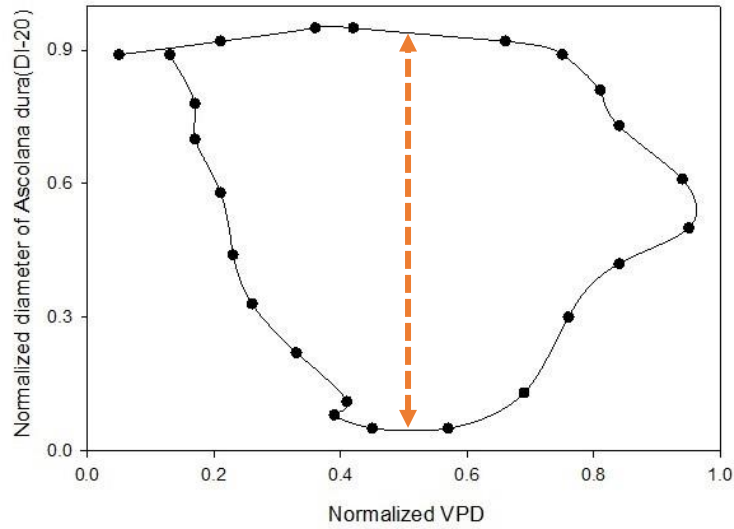UNIVERSITÀ POLITECNICA DELLE MARCHE
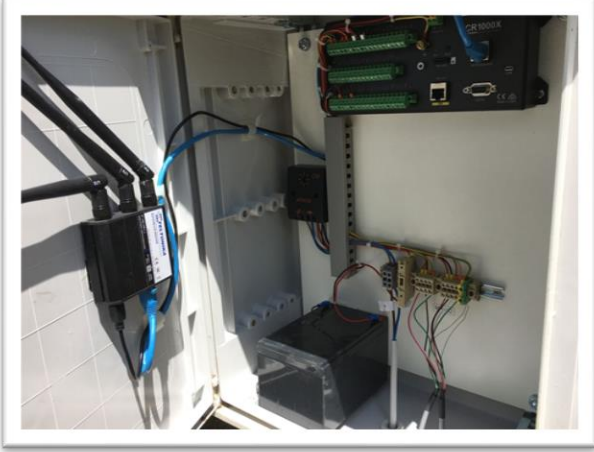
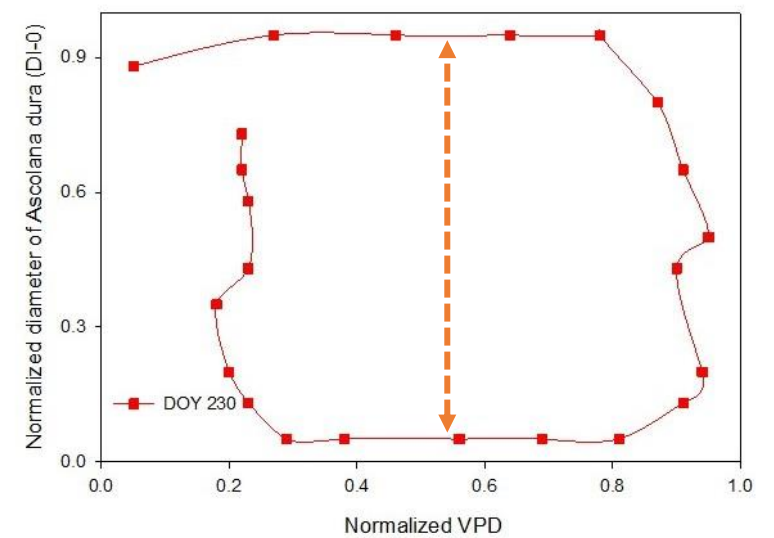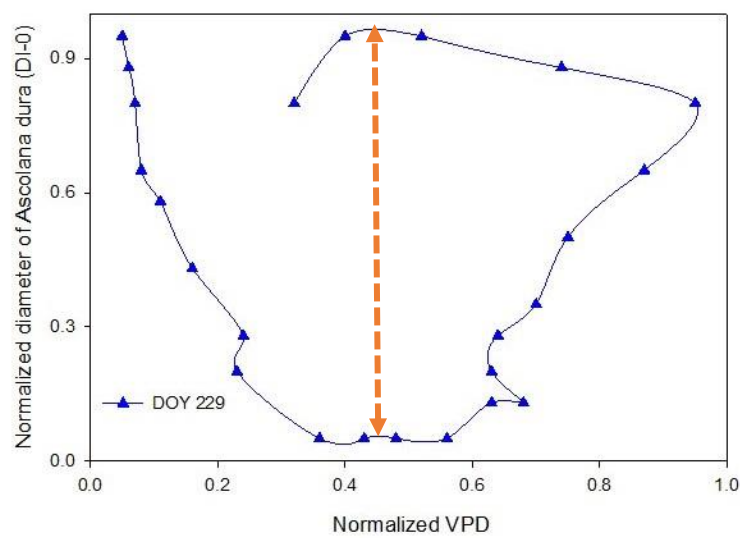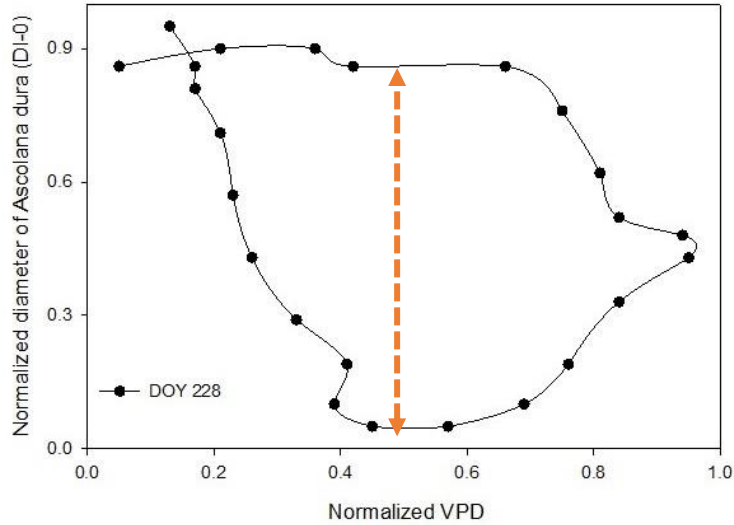# Hysteresis curve of fruit diameter versus VPD
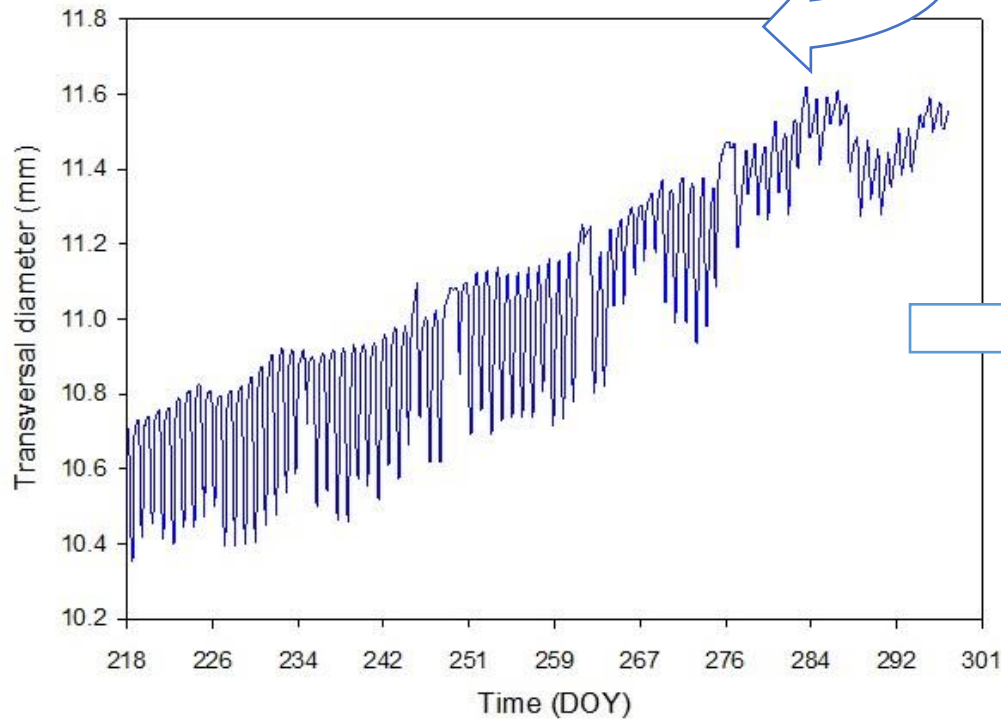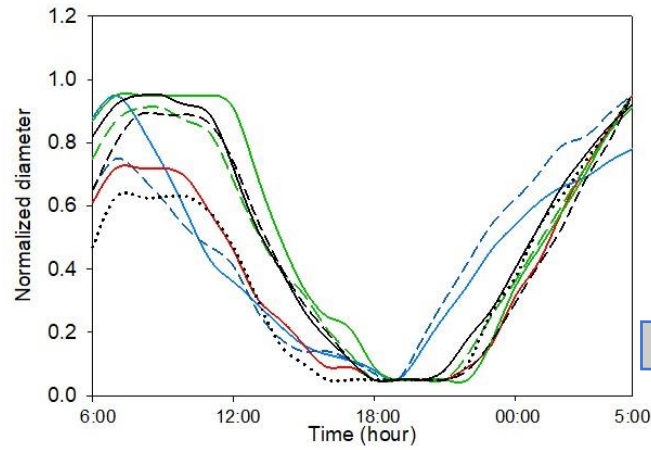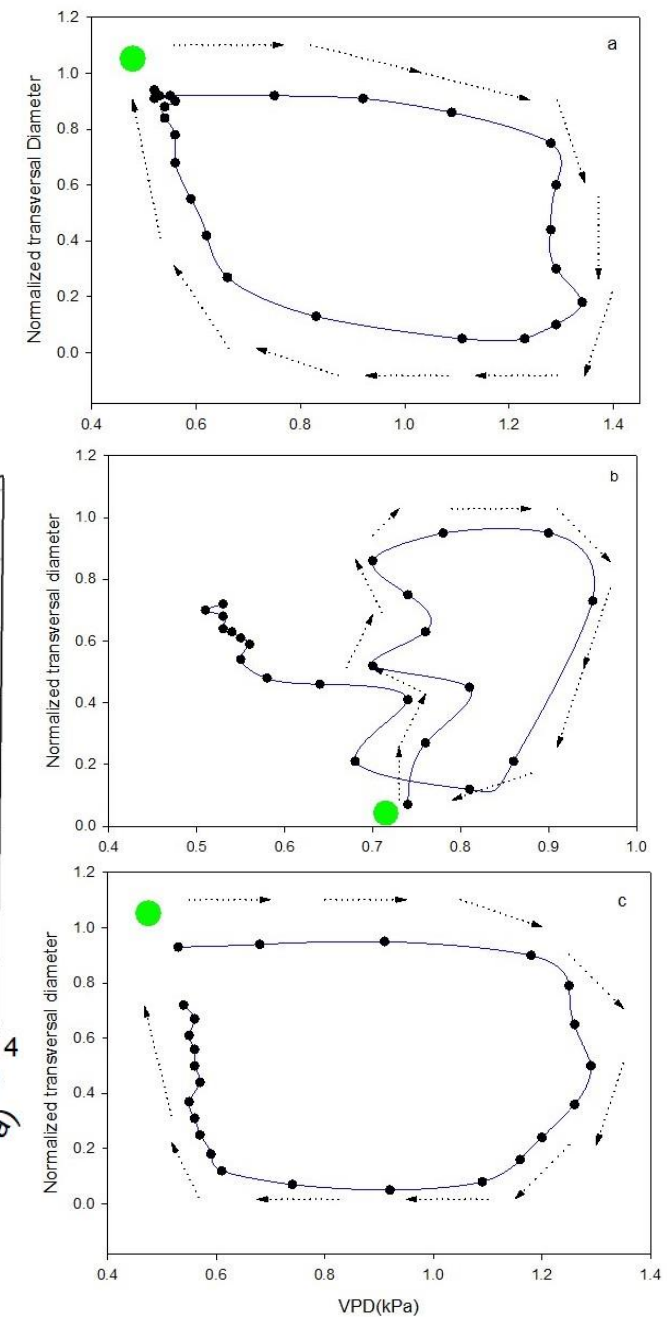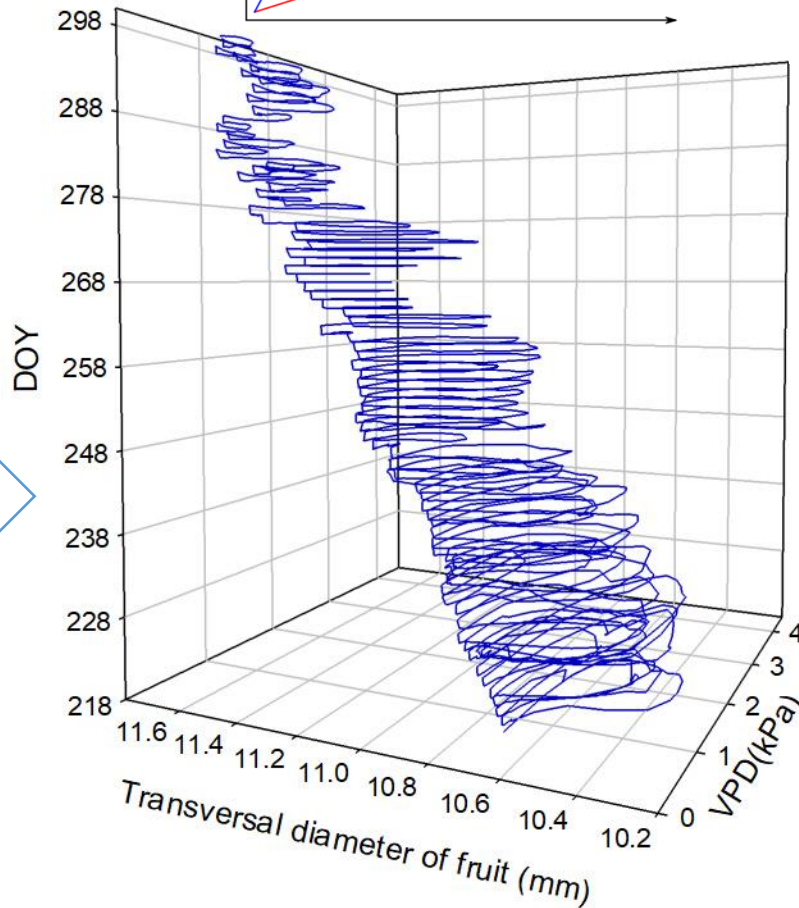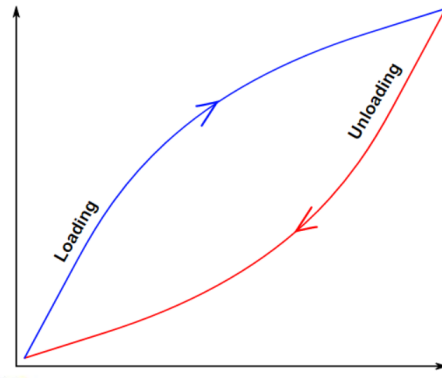
Water status index by hysteresis

Irrigated
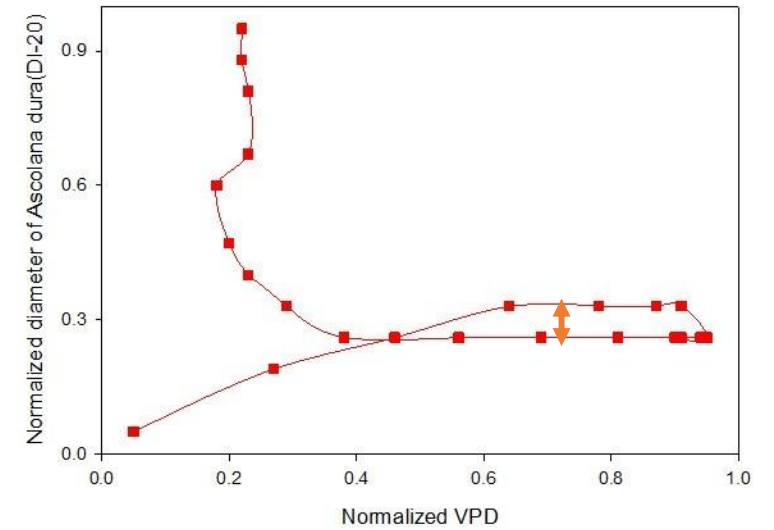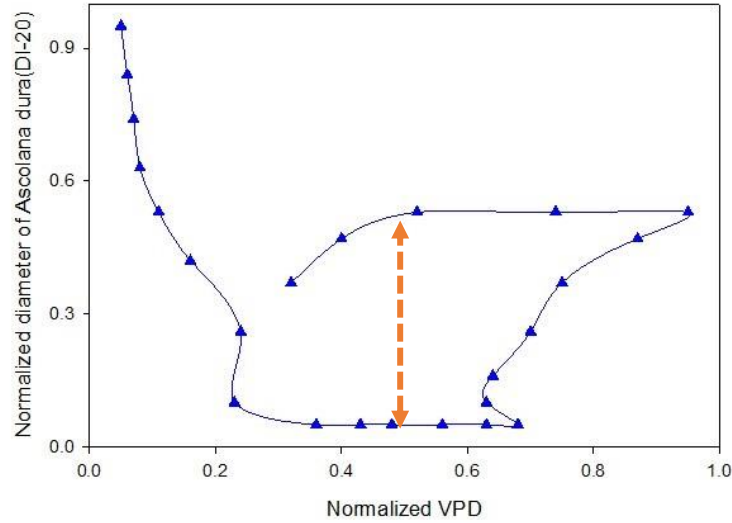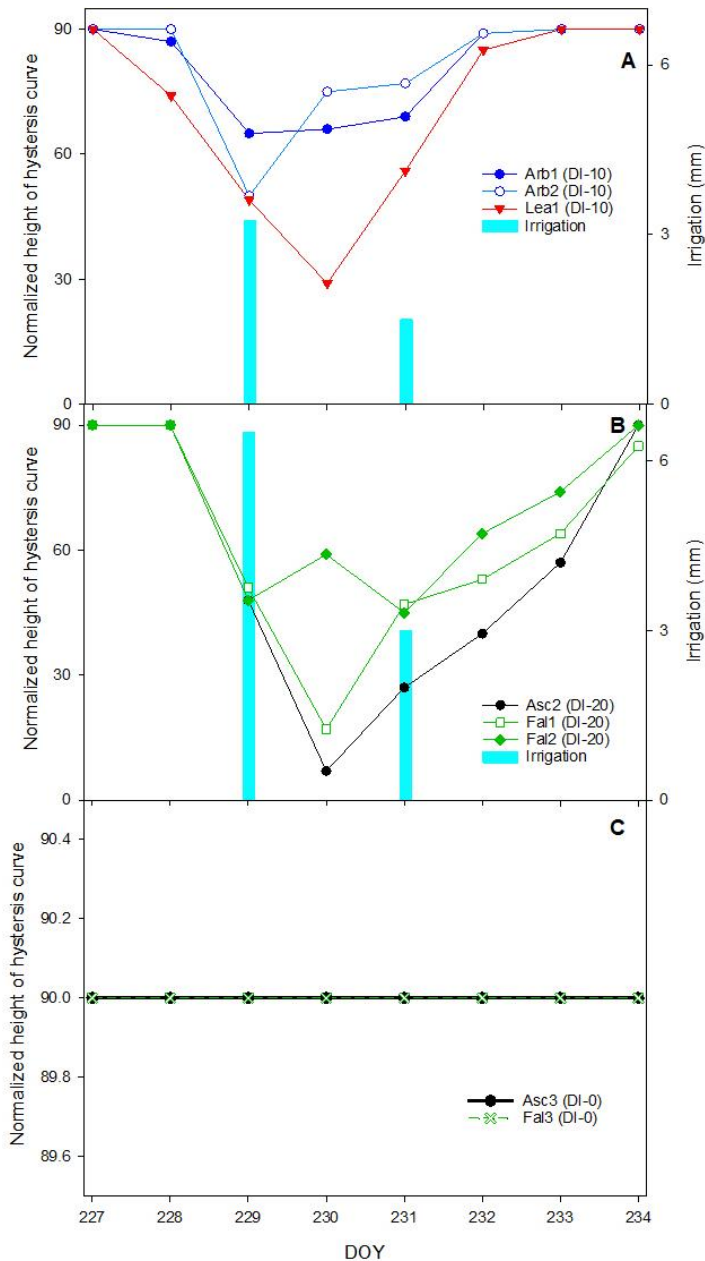
Non-Irrigated

Day before Irrigation

Irrigation day

Day after Irrigation

Water status index by hysteresis

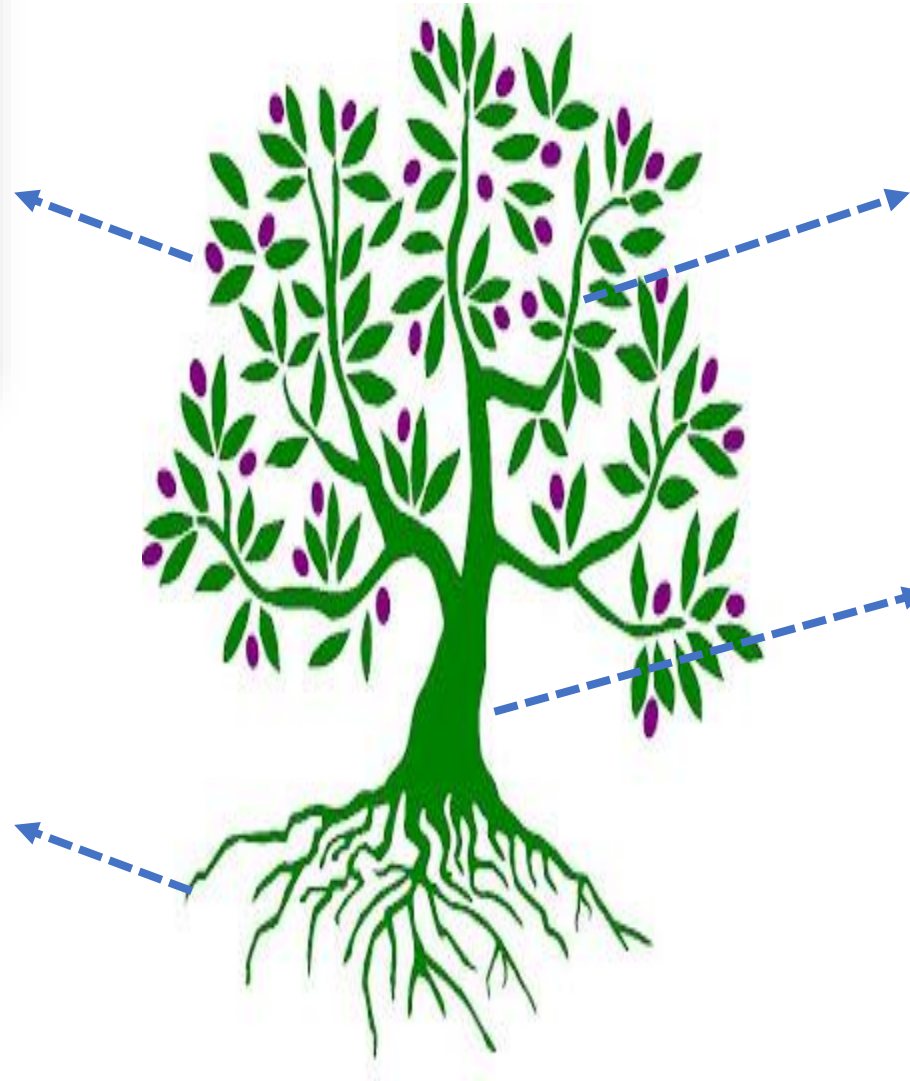Repeated measures ANOVA test for height of hysteresis

Treatment Name	N	Mean	Std Dev	SEM	Student-Newman-Keuls test
Fal1 (DI-20)	8	62.125	25.503	9.017	a
Fal2 (DI-20)	8	70	18.83	6.657	a
Fal3 (DI-0)	8	90	0	0	b
Asc2 (DI-20)	8	56.125	31.692	11.205	A
Asc3 (DI-0)	8	90	0	0	B

With the normal circadian pattern of VPD

↓

hysteresis height's change is influenced by daily fruit diameter change (fruit growth dynamics)

III stage of the fruit development

↓

daily fruit growth dynamics can be explained as changes in flows of water into and out of the fruit

Consequently, hysteresis magnitude change is closely related to water status of fruit

Increasing hysteresis height is a sign of water stress Which is **not cultivar-specific**
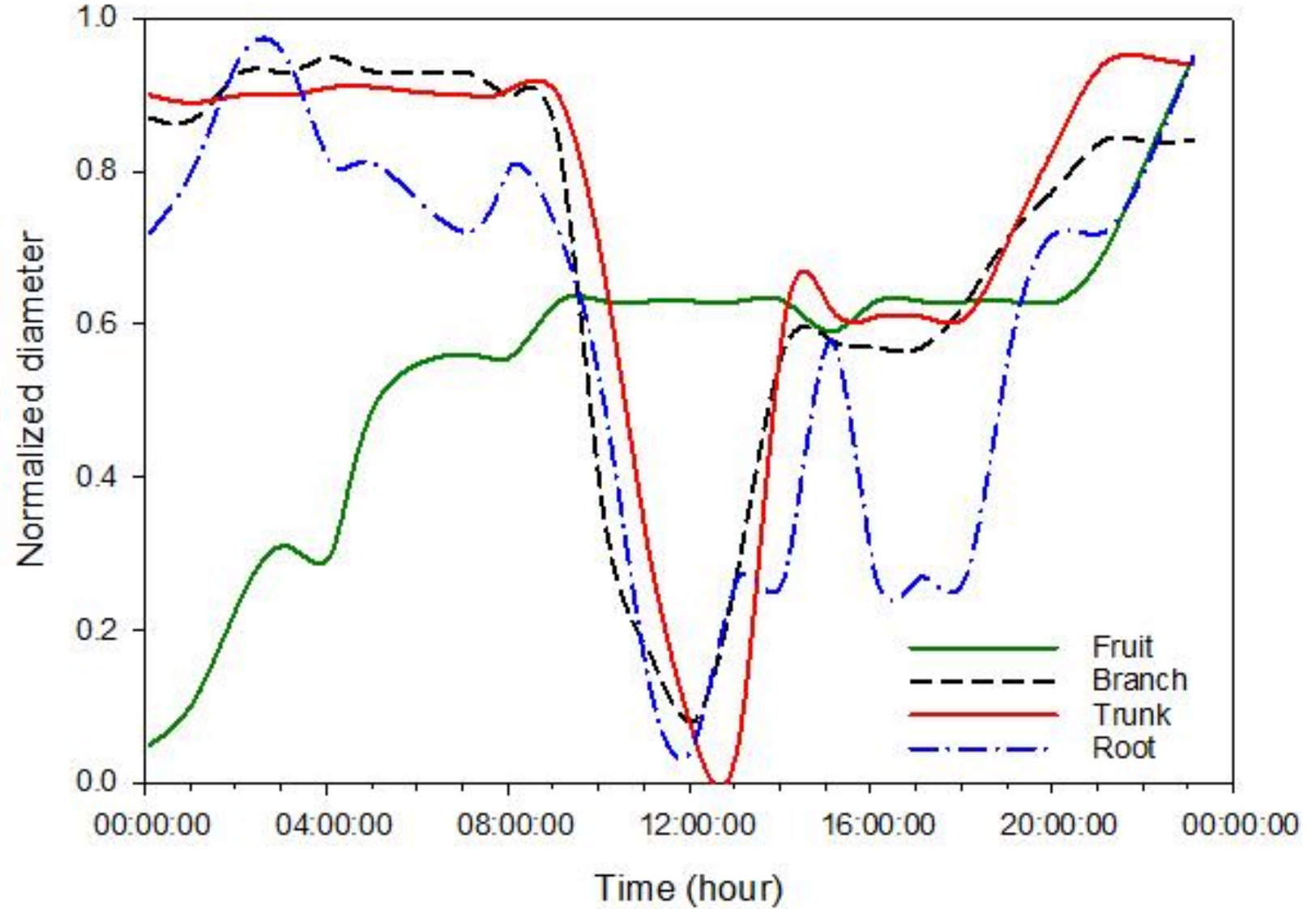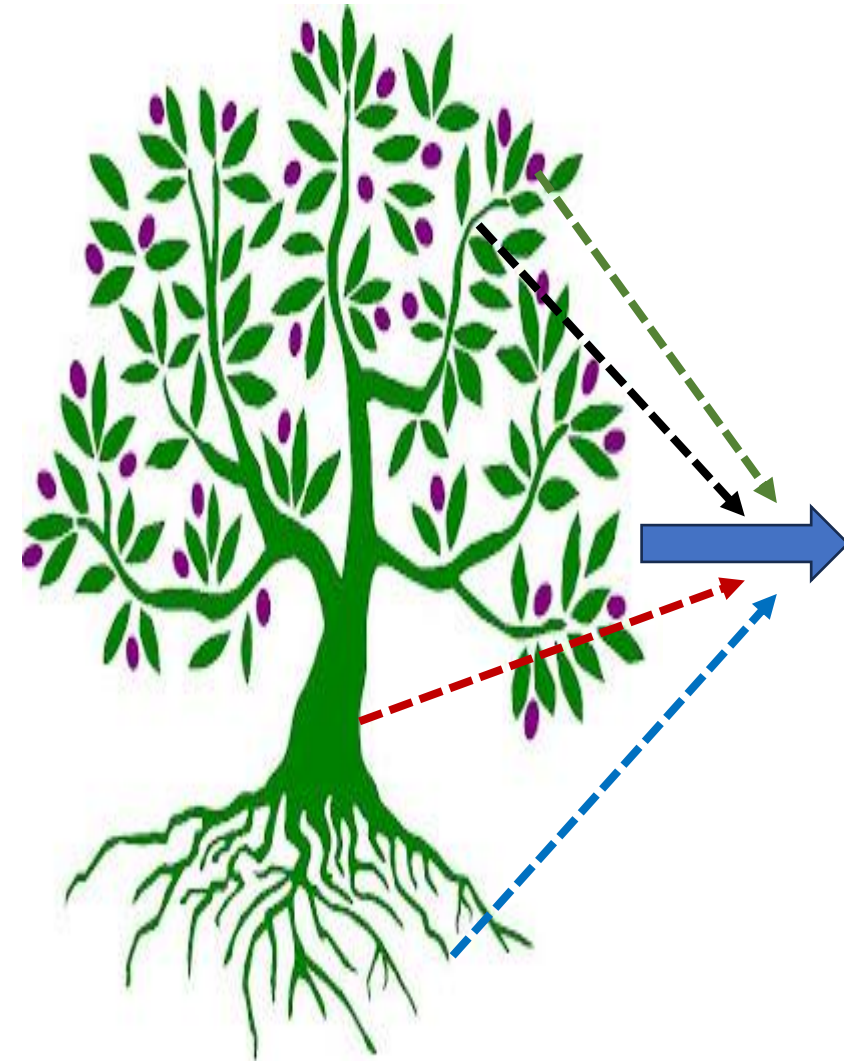
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Next step

Next step

21 Sep 2023

Thank You for Your attention

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