



Fruit sunburn and heat prediction in canopies: (The SHEET Alert System APP)

Friday, September 29, 2023



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Sunburn damages in vineyards and apple orchards

Intense heat waves and prolonged dryness increased the occurrence of sunburn damages.

Berry shrivel



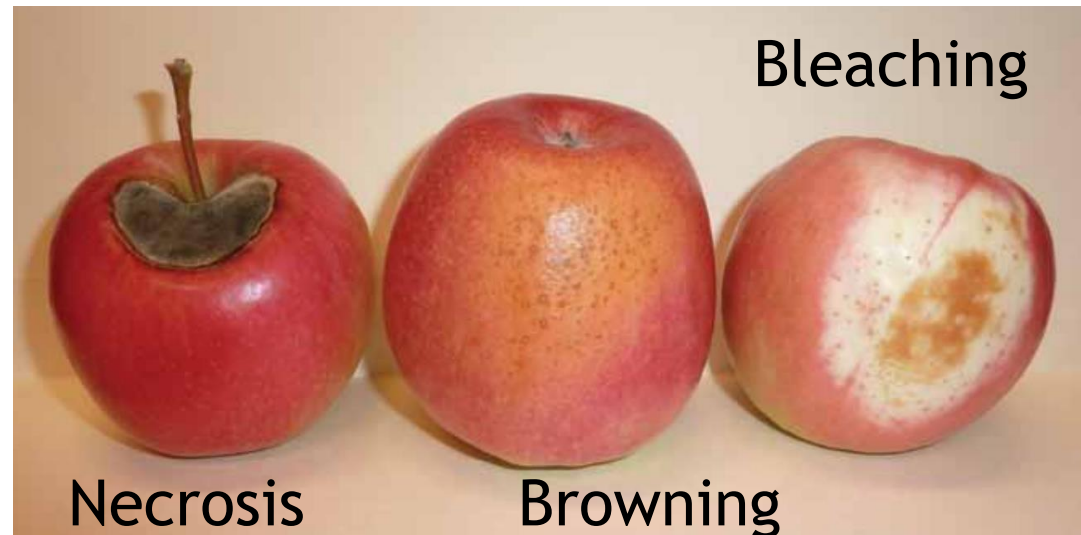
Browning



Berry necrosis



The most common symptoms:



Monitoring fruit and berry temperatures to find the threshold levels for the appearance of the sunburn damage



Evaluating the effects of some adaptive strategies:

- 1) irrigation during ripening
- 2) sprayings with caolin and zeolite
- 3) cooling mist on the cluster zone
- 4) Shading covers
- 5) Different training systems

APPLE ORCHARDS

2021, 2022. Spindle - shade 15%



2021, 2022. Planar cordon - shade 15%



2022. Spindle - shade 40%



2022. Spindle - shade 0%



APPLE RESULTS

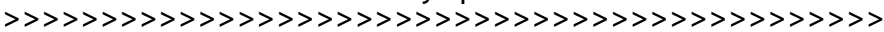


Harvest

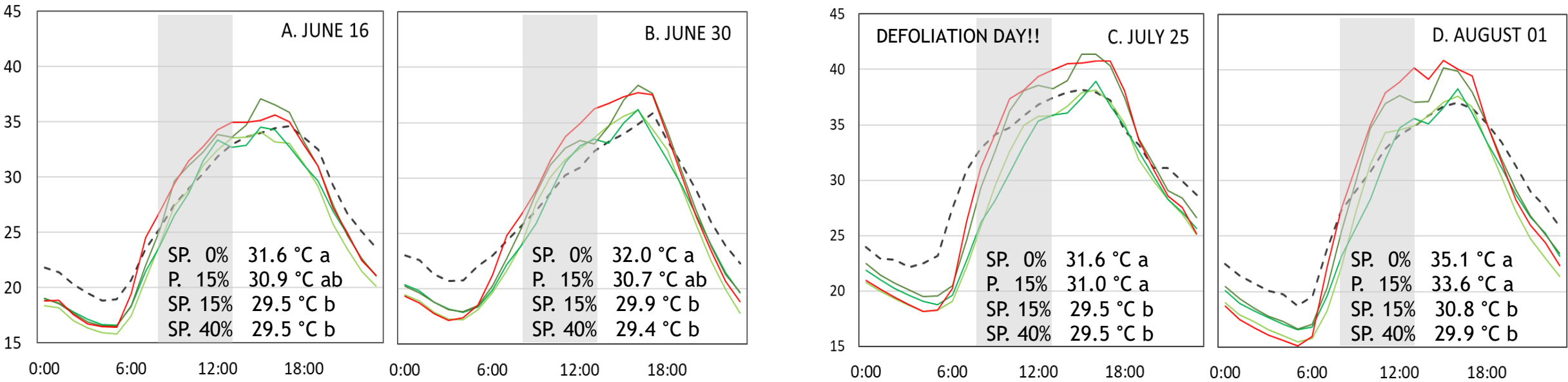
First symptoms
21/07

More symptoms

02/08

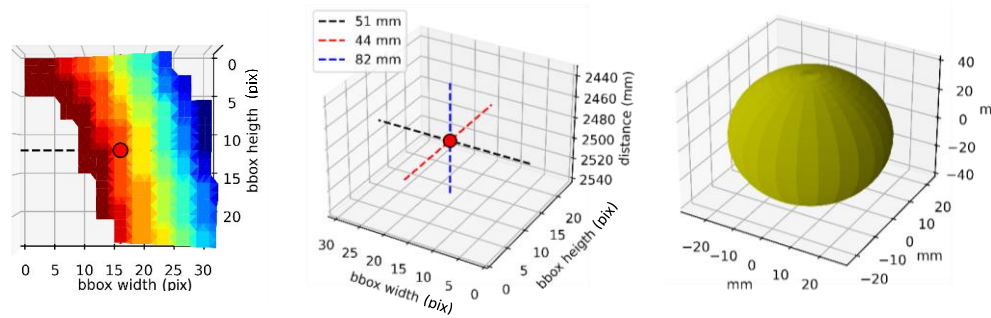
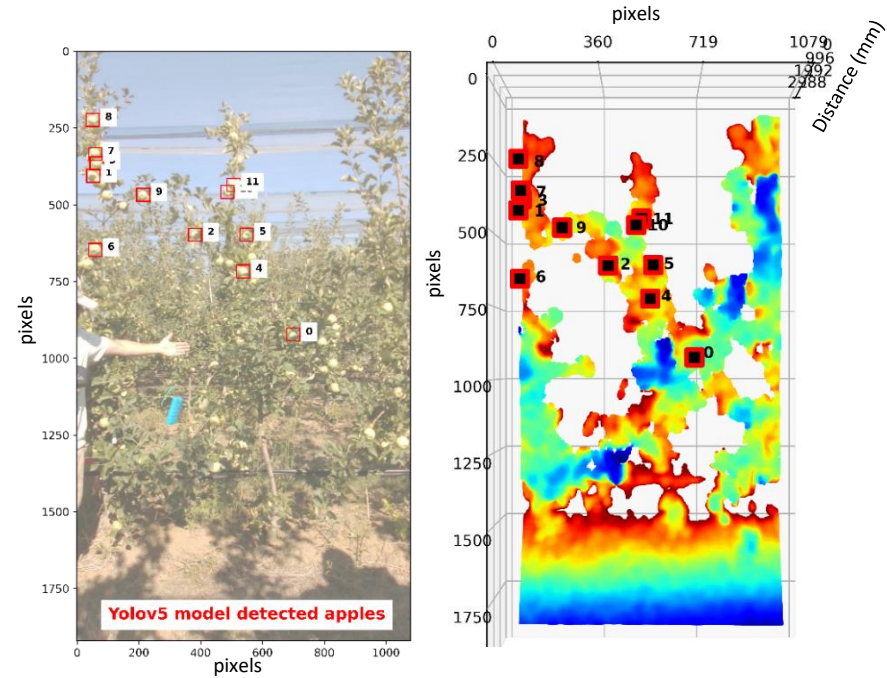


14/06

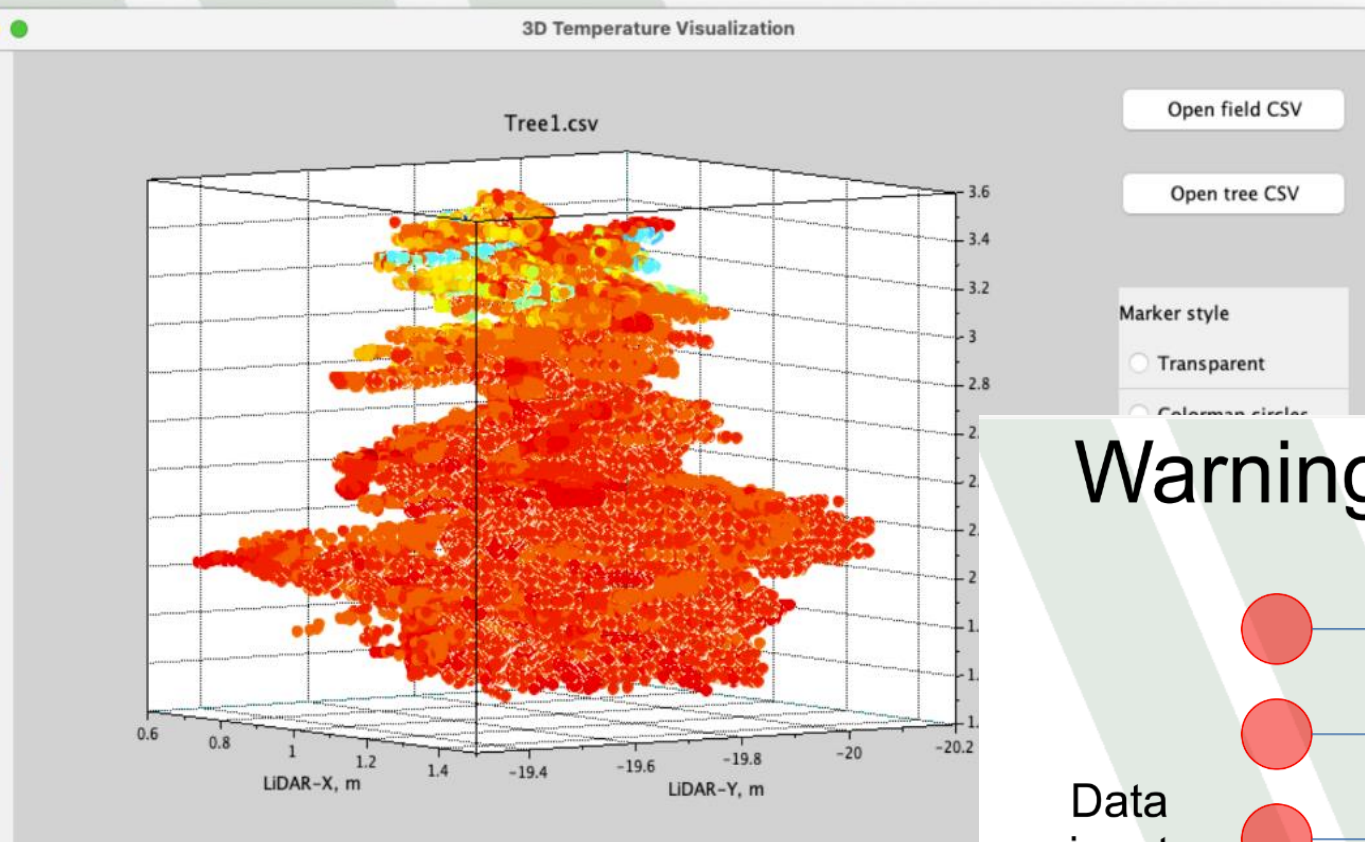


--- AIR T EXTERNAL — SP. 0% — P. 15% — SP. 15% — SP. 40%

Fruit temperature and position estimation



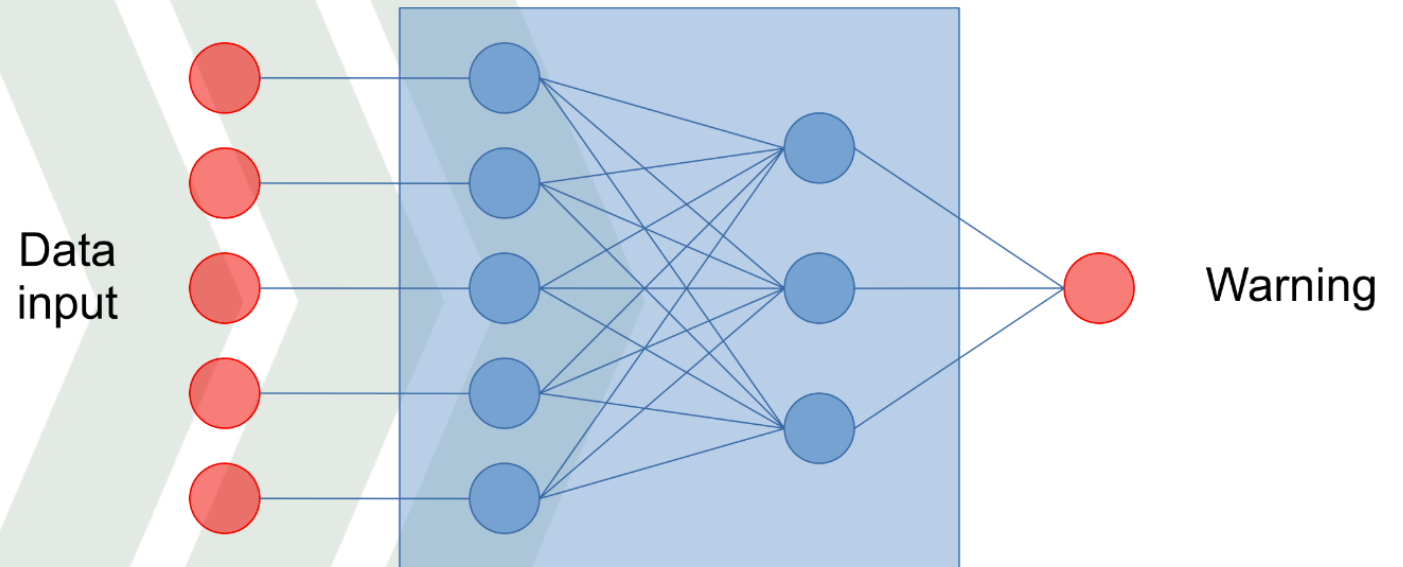
Analysis of temperature in canopy



Difference:
- vertically

Radiation:
direct


Warning model – machine learning



THE SHEET MOBILE APP TO ALERT GROWERS

08:06

Growing fruits



Apple (Pink Lady)
Pink Lady 1

- Measurement Date: **29/07/2023**
- Fruit Size: **60.0 mm**
- Fruit Color: **rather ripe**
- Light Exposure: **full sun exposed**
- Discoloration: **no sunburn**

Navigation icons: leaf, cloud, gear

08:07

Weather

07:38:25 Fri 29 Sep

H: 27°
17°
L: 16°

clear
Fossolo, IT
Pink Lady 1

24h Daily

10 AM	1 PM	4 PM	7 PM	10 PM	1 AM	4 AM
☀️	☀️	☀️	☁️	☀️	☀️	☁️
16°	18°	23°	27°	23°	20°	19°

2 km/h Wind Speed
75% Humidity

09:09 Sunrise
Sunset 21:00

Navigation icons: leaf, cloud, gear

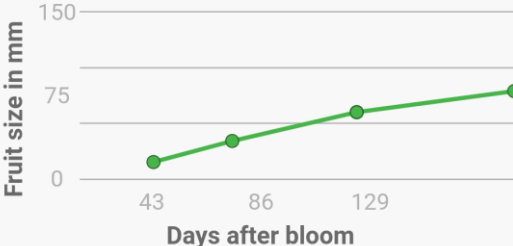
08:08

Growing fruits

Apple (Pink Lady)
Pink Lady 1
Lat: 44.5148397, Long: 11.4071929

Last Measurement Date
29/09/2023

Fruit Size
79 mm
+ 64 mm



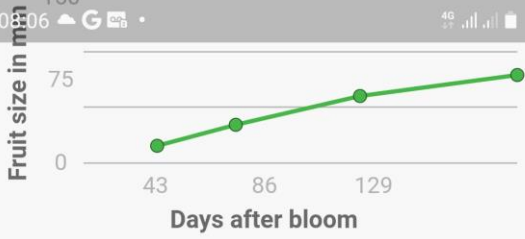
Days after bloom	Fruit size in mm
43	~15
86	~40
129	~65
~150	79

Fruit Color
ripe

Add Measurement

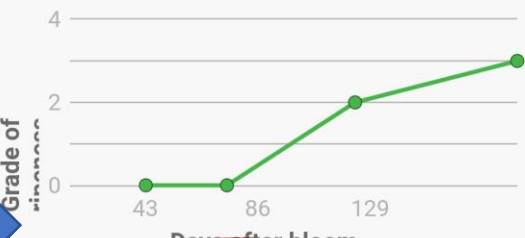
Navigation icons: leaf, cloud, gear

08:06




Days after bloom	Fruit size in mm
43	~15
86	~40
129	~65
~150	79

Fruit Color
ripe



Days after bloom	Grade of ripeness
43	0
86	0
129	2
~150	3

Discoloration
beginning sunburn



Days after bloom	Grade of sunburn
43	0
86	0
129	0
~150	1

Add Measurement

Navigation icons: leaf, cloud, gear



Thank you for your attention



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