



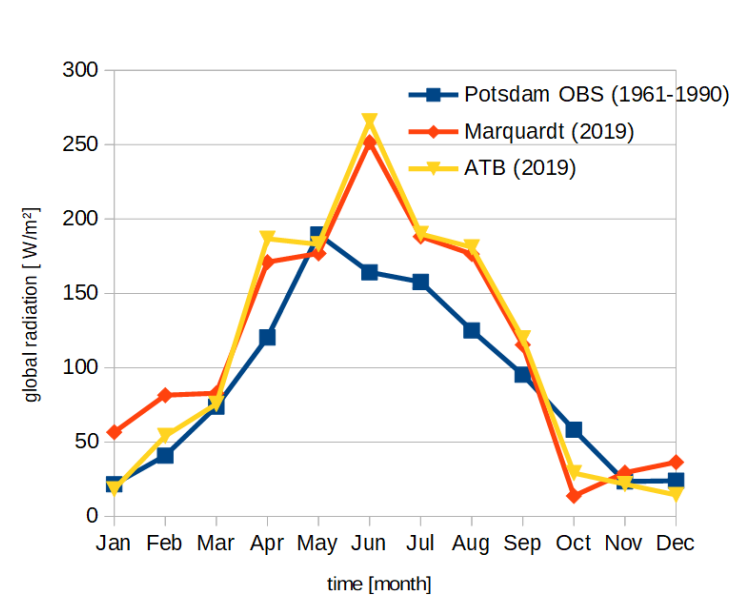
SHEET

Sunburn and HEat prediction in canopies for Evolving a warning Tech solution

Nikos Tsoulas, Laszlo Baranyai, Brunella Morandi, Trim Bresilla, Bastian Wingerath, Alice Lucchi, Manuela Zude

Kick-off cofunded Projects Seminar
17-18th March 2021

Goal and context



>53°C



Goal and context



Objectives

The objectives of the project SHEET capture

- (i) the analysis and modelling of apparent temperature distribution at the fruit surface employing terrestrial remote sensing
- (ii) validation of the temperature distribution model and findings on the fruit damage considering the peak and duration of radiation and temperature degrees
- (iii) prototype of a warning IoT solution to inform growers on the risk of damage by means of a mobile application

SHEET project's contribution

Ambition	Impact
Application of remote sensing for developing a thermodynamic and big data based model & Open source software tools (temperature distribution model, fruit detection, fruit temperature analysis, fruit damage assessment)	Knowledge gaining on the spatio-temporally resolved temperature distribution in canopy and fruit & Driving force for implementing plant sensor data into agronomic models
Scientific approach to find and explain effects and interaction of high temperature in orchards and vineyards & Validation of findings to enable transfer to other crops	Real-time support for fruit growers, storage management, and marketing & Contributing to climate resilience
Pragmatic IoT solution with fully implemented cyber security routines & Cost-effective solution for stakeholders	Reducing food waste along the supply chain of fresh fruit & Enhancing the economic sustainability for stakeholders along the supply chain

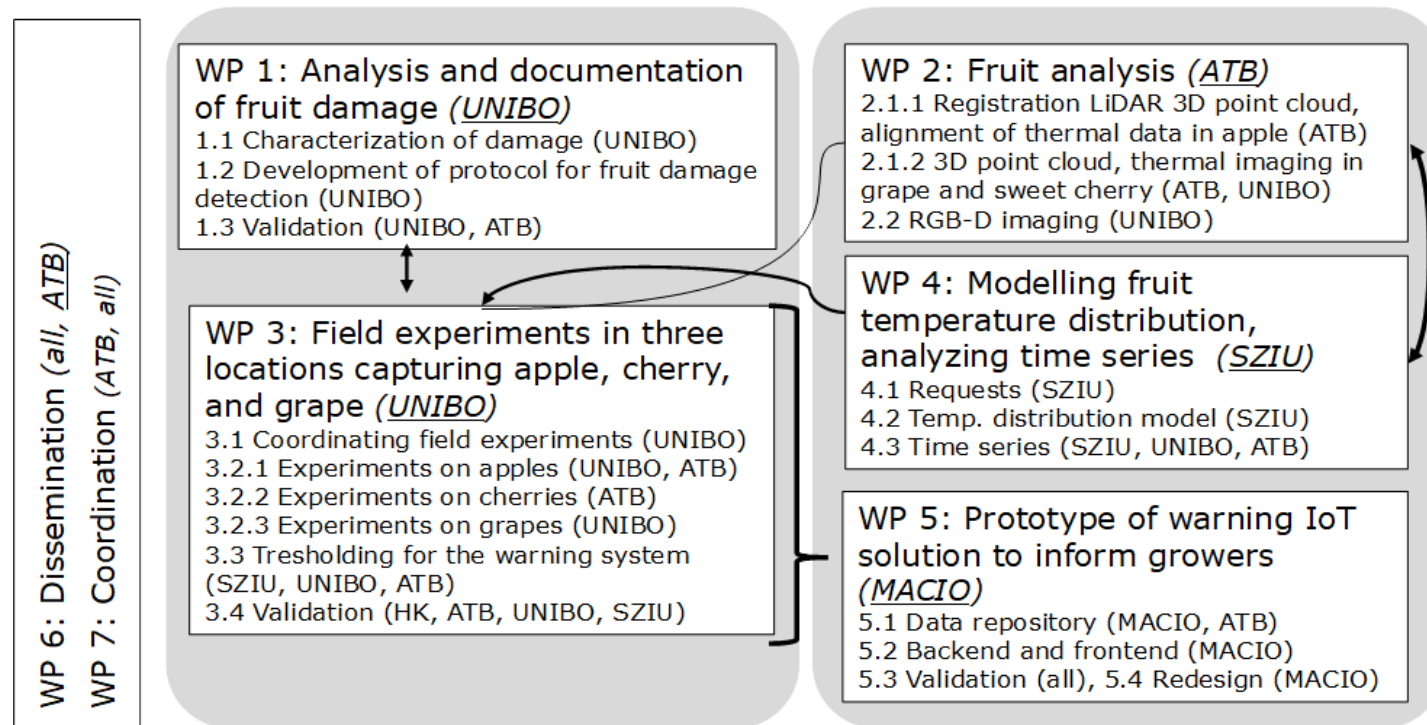
Technology readiness level

TRL:

- 8** (fruit detection and thermal imaging solution),
- 7** (fruit assessment),
- 8** (case specific temperature distribution model),
- 5** (temperature distribution model for varying canopies),
- 6** (mobile App as warning solution)



Workpackages



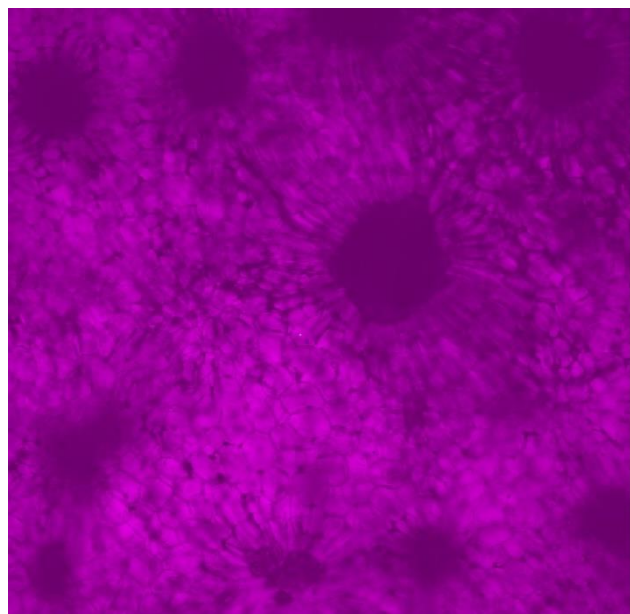
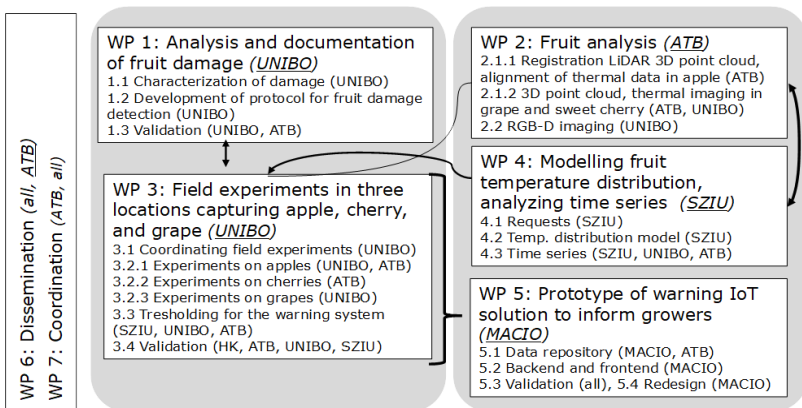
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Workpackages

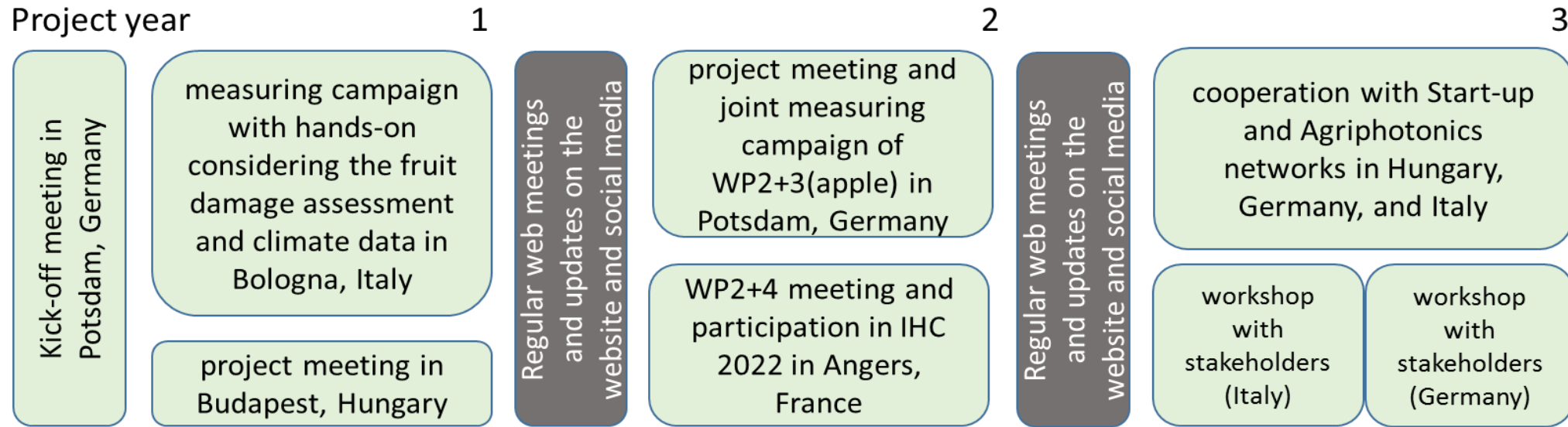


Partners

- Hungary / Budapest / **Szent Istvan University (SZIU)**
- Italy / Bologna / **Department of Agricultural and Food Sciences (UNIBO)**
- Germany / Kiel / **macio GmbH (MACIO)**
- Italy / Bologna / **HK Horticultural Knowledge srl (HK)**
- Germany / Potsdam / **Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB) (Coordinator)**



Cooperation with stakeholders



Cooperation with stakeholders

Scientific conferences (ISHS, IEEE)

Operational Groups of European Innovation partnership: OGs Smart Sustainable and Specialized Orchard (2019 – 2022), SAL.VA.RE.BIO.VIT.E.R. (2017 – 2020), Versuchs- und Kontrollring für Obst- und Gemüsebau in Brandenburg AquaC+ (2017 – 2021), PRIMEFRUIT (2018 – 2021)

University Bologna working with local cooperatives and consortia

Experimental fruit station Müncheberg > MaluSun project (2022 – 2025)

Startups in Italy (**HK**, Apofruit), Germany (CrocusLabs), Hungary (SKC Consulting)

AgriPhotonics – bilateral Network gathering 30 companies in Israel and Germany

OptecBB – 115 companies and research institutions



Dissemination and outreach

- Publications and presentations to the scientific community
- SHEET website setup and NEWS updates
- Social media will be employed to inform about activities and results.
- Communications in journal for growers (<Informatore Agrario>, <Obstbau>, <Besseres Obst>, <frutticoltura>, etc.)
- Press releases, Videos
- Communication with networks





LET'S KEEP IN TOUCH!

Please feel always free to reach out to us.

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WEBSITE

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#thermalimaging
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Thank you for your attention!