

# Digitization in Horticulture

*Manuela Zude-Sasse*

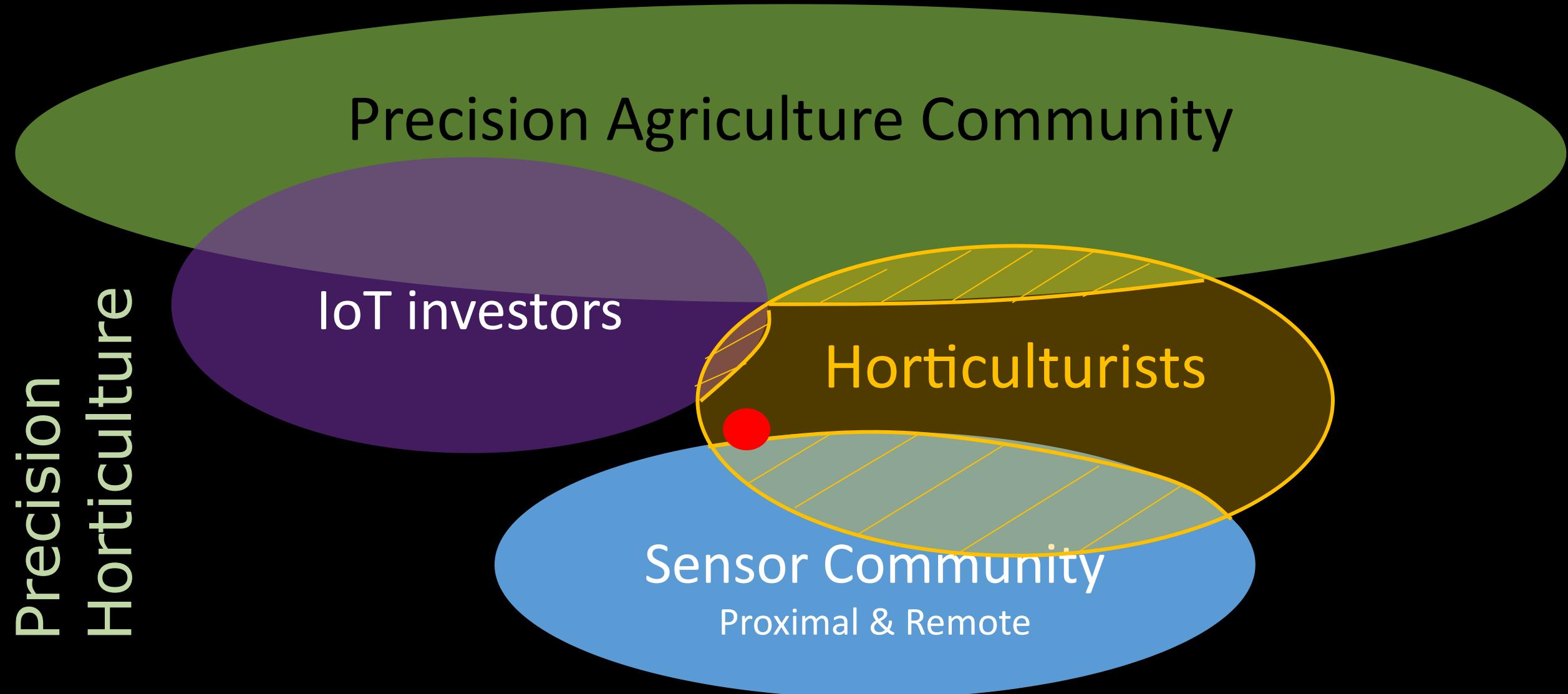
Twitter: Prec\_Hort



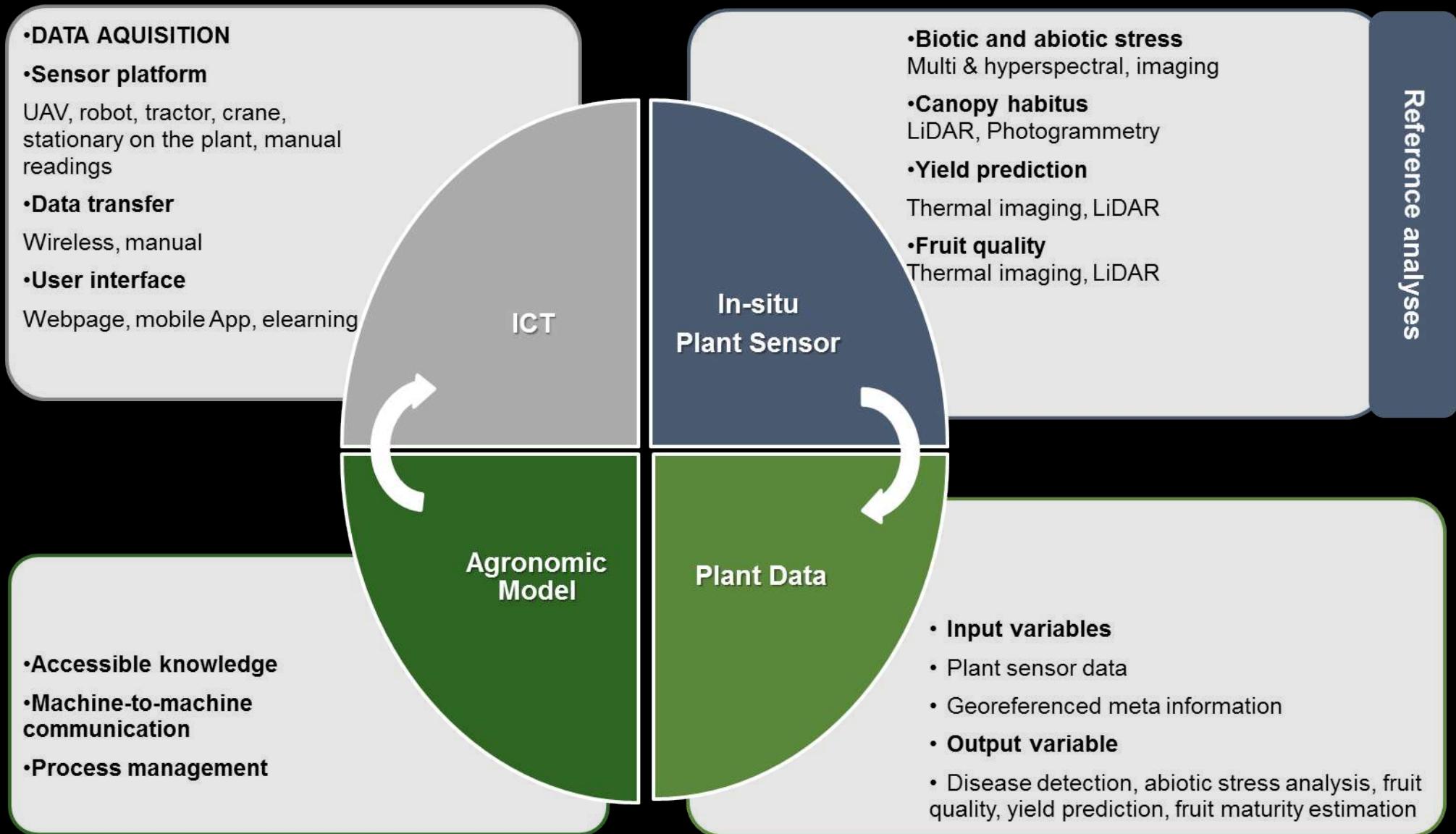
*„Speaking Yield“*



# Who is doing Precision Horticulture ?



# Precision Horticulture



# How to measure in the orchard?

## Tractor

Autonomous platform  
Crane  
Unmanned aerial system  
Satellite  
Wireless sensor network



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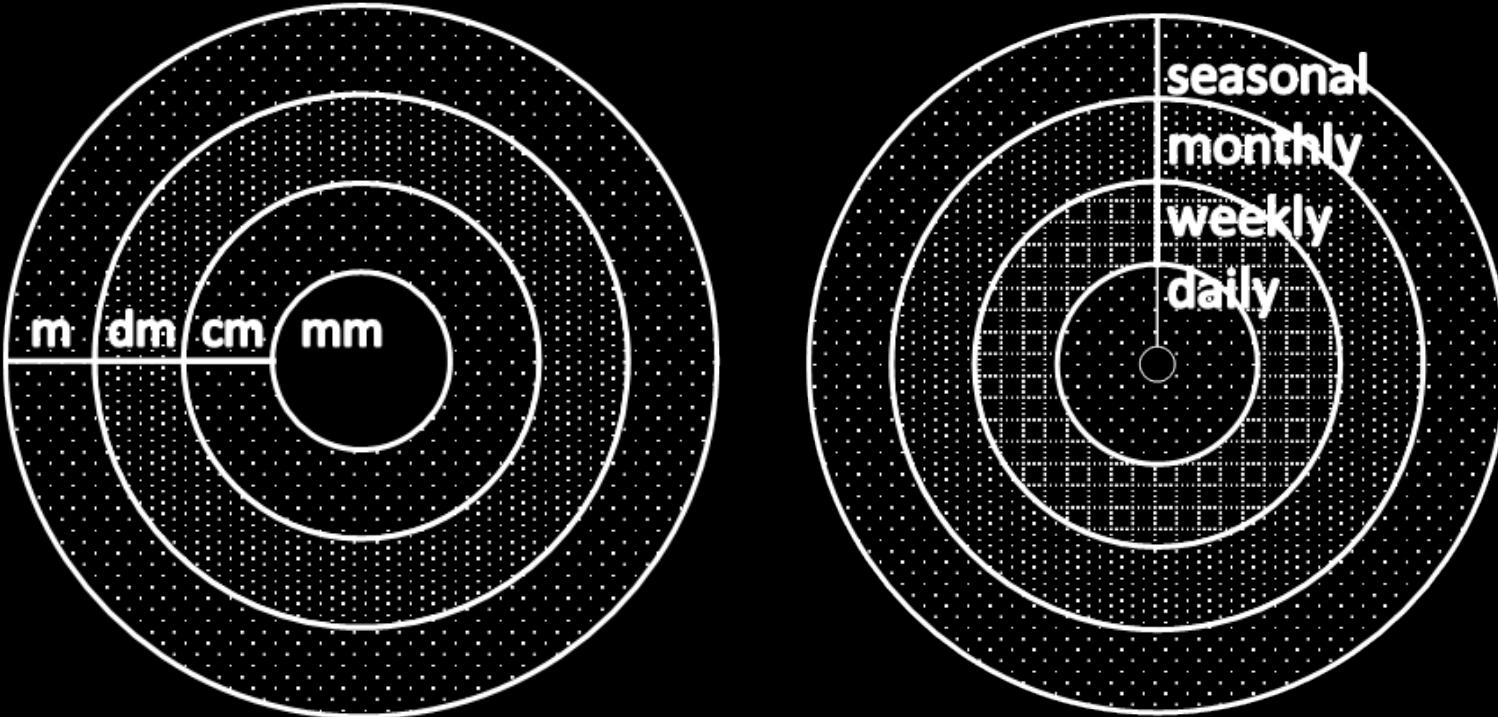
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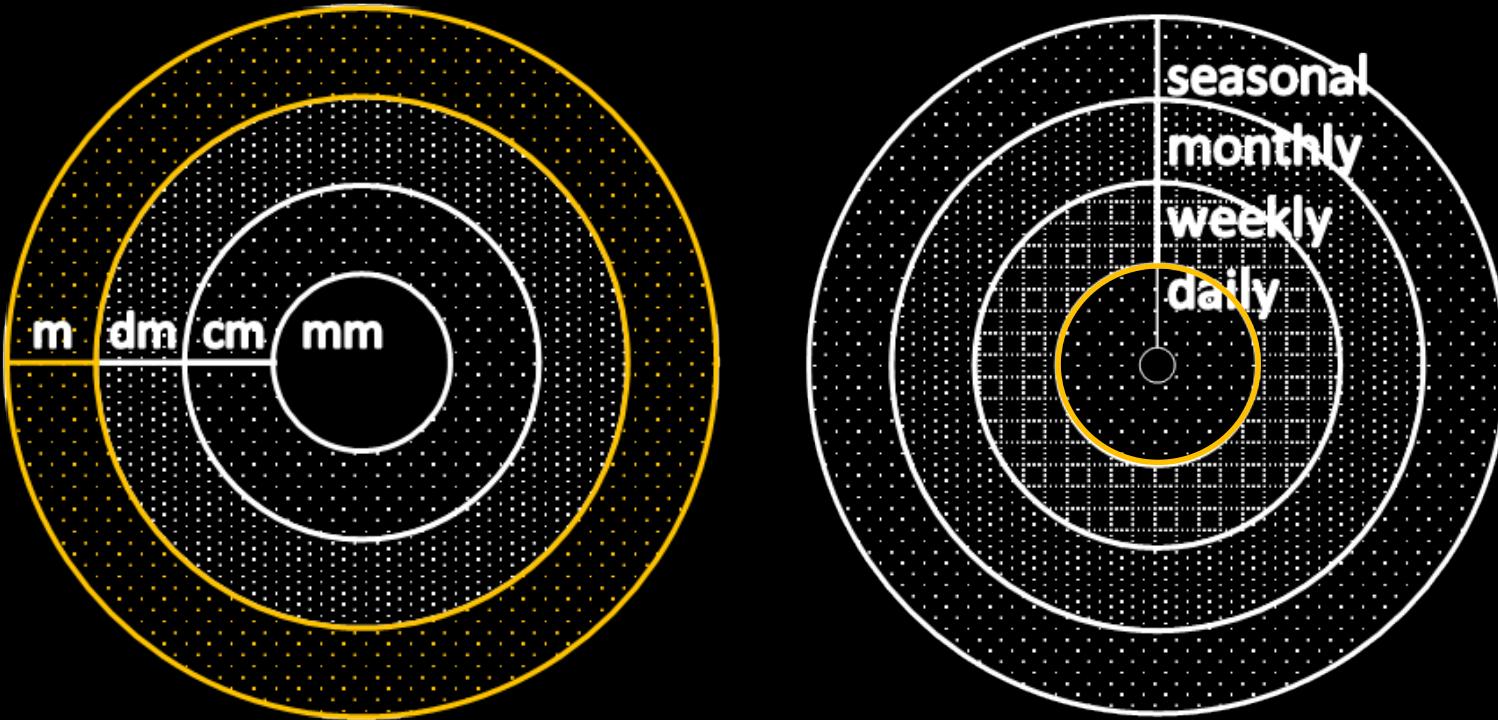
# Precision Horticulture



# Spatio-temporal data in horticulture

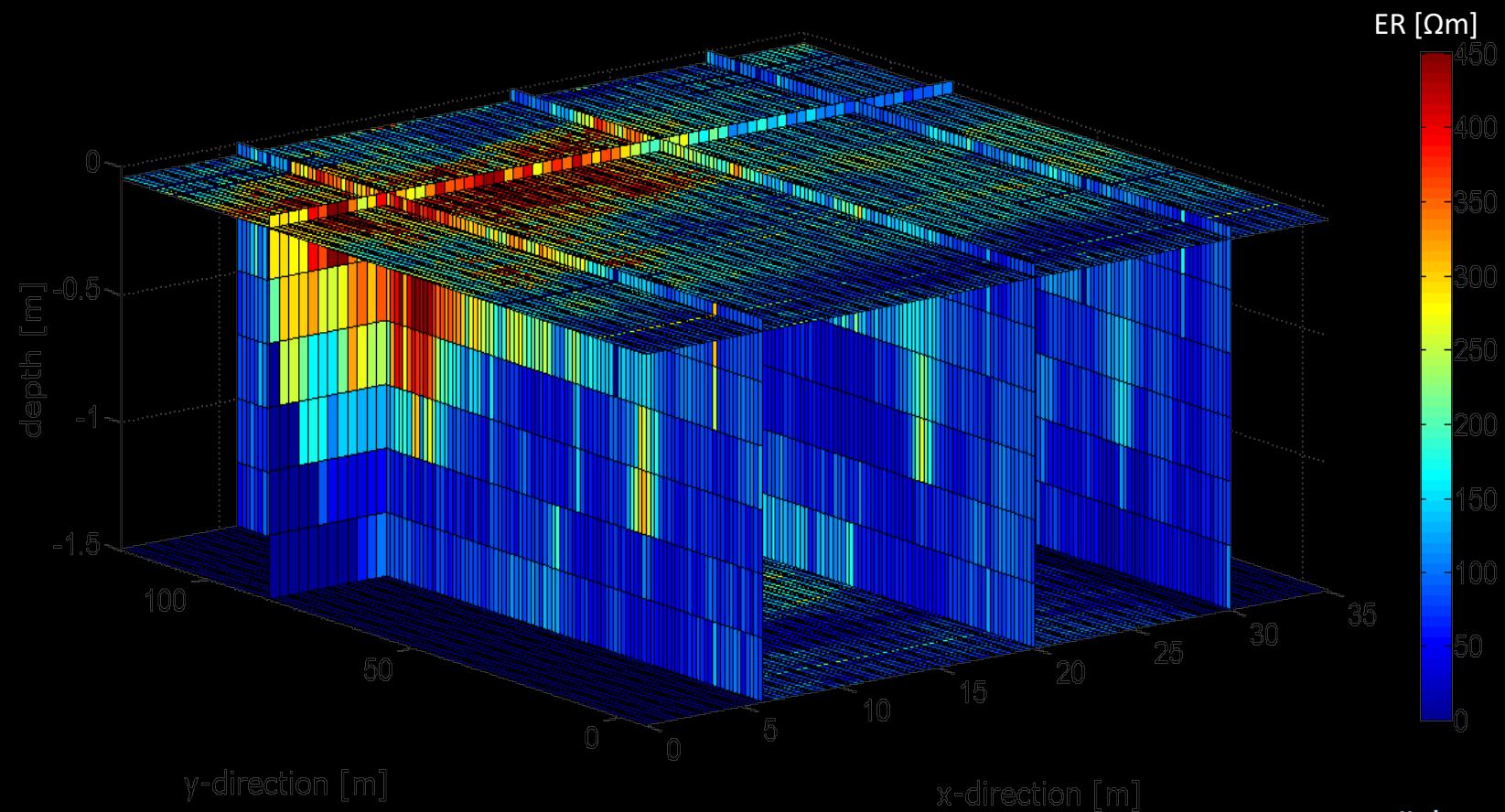


# Spatio-temporal data: Irrigation



# Irrigation: Soil information

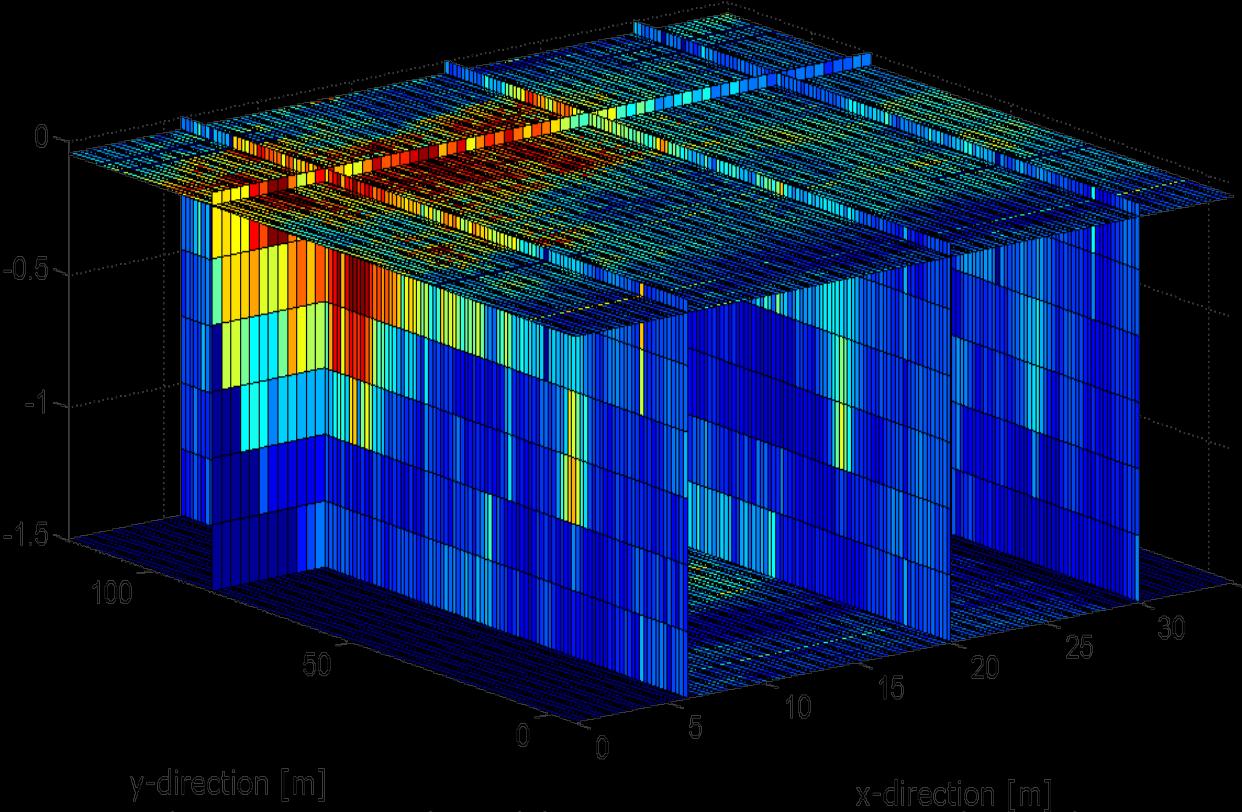
**MEDIUM spatial resolution & low temporal resolution**



Käthner and Zude (2015). eJHS

# Irrigation: Soil information and weather data

**But weather data: low spatial resolution & high temporal resolution**

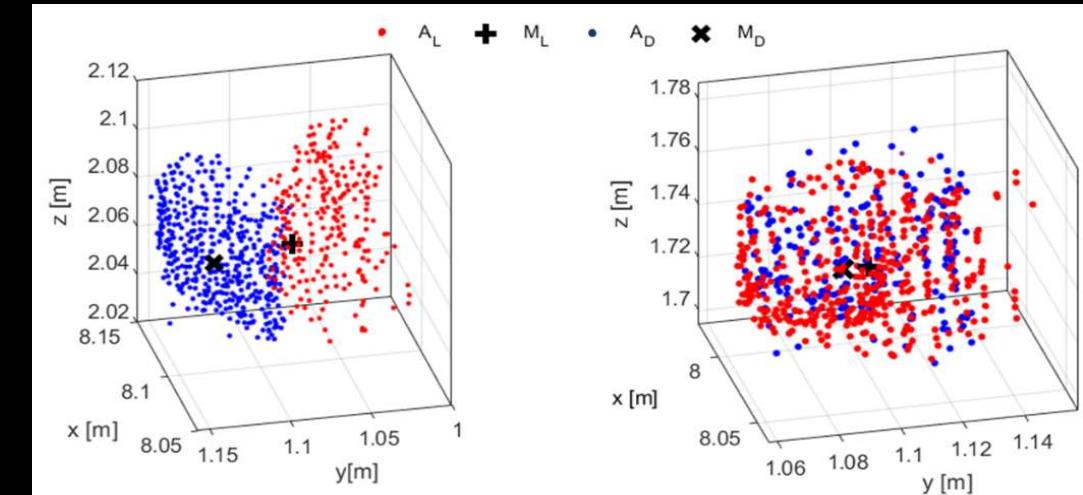
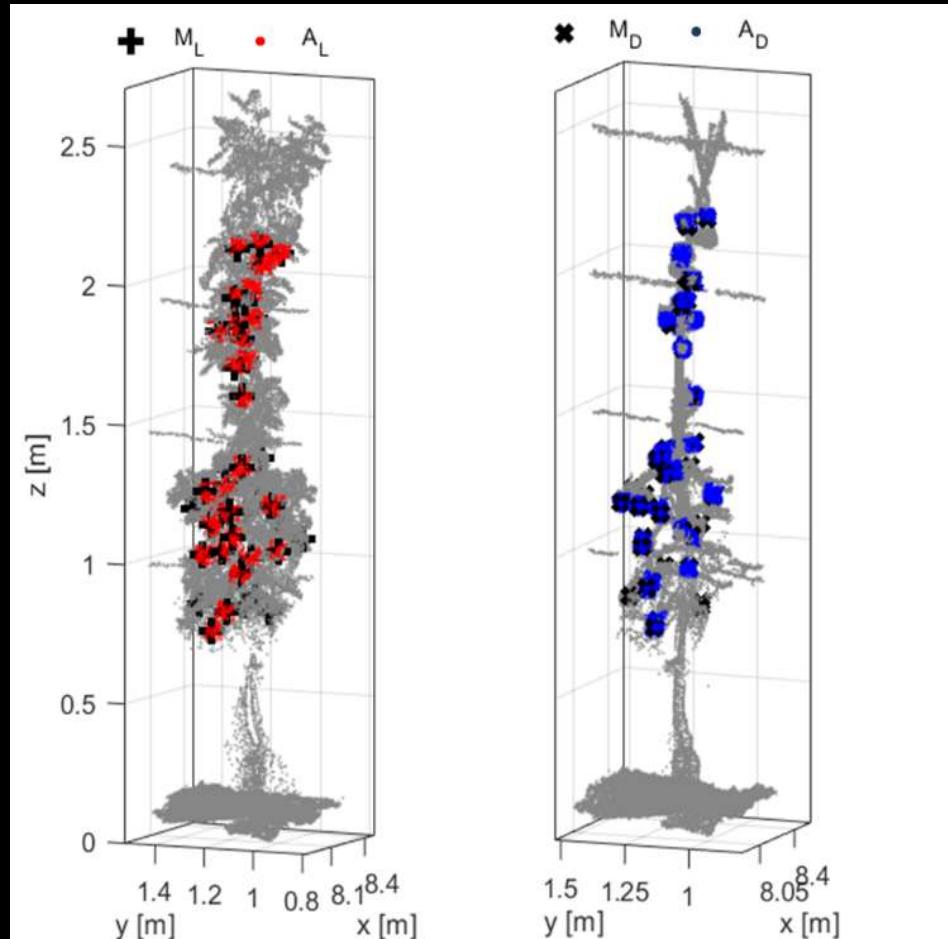


Käthner; Ben-Gal; Gebbers; Peeters; Herppich; Zude-Sasse (2017).

Frontiers in Plant Science 8: 1053. <http://doi.org/10.3389/fpls.2017.01053>

# Irrigation: Plant data

But plant data: MEDIUM spatial resolution & high temporal resolution

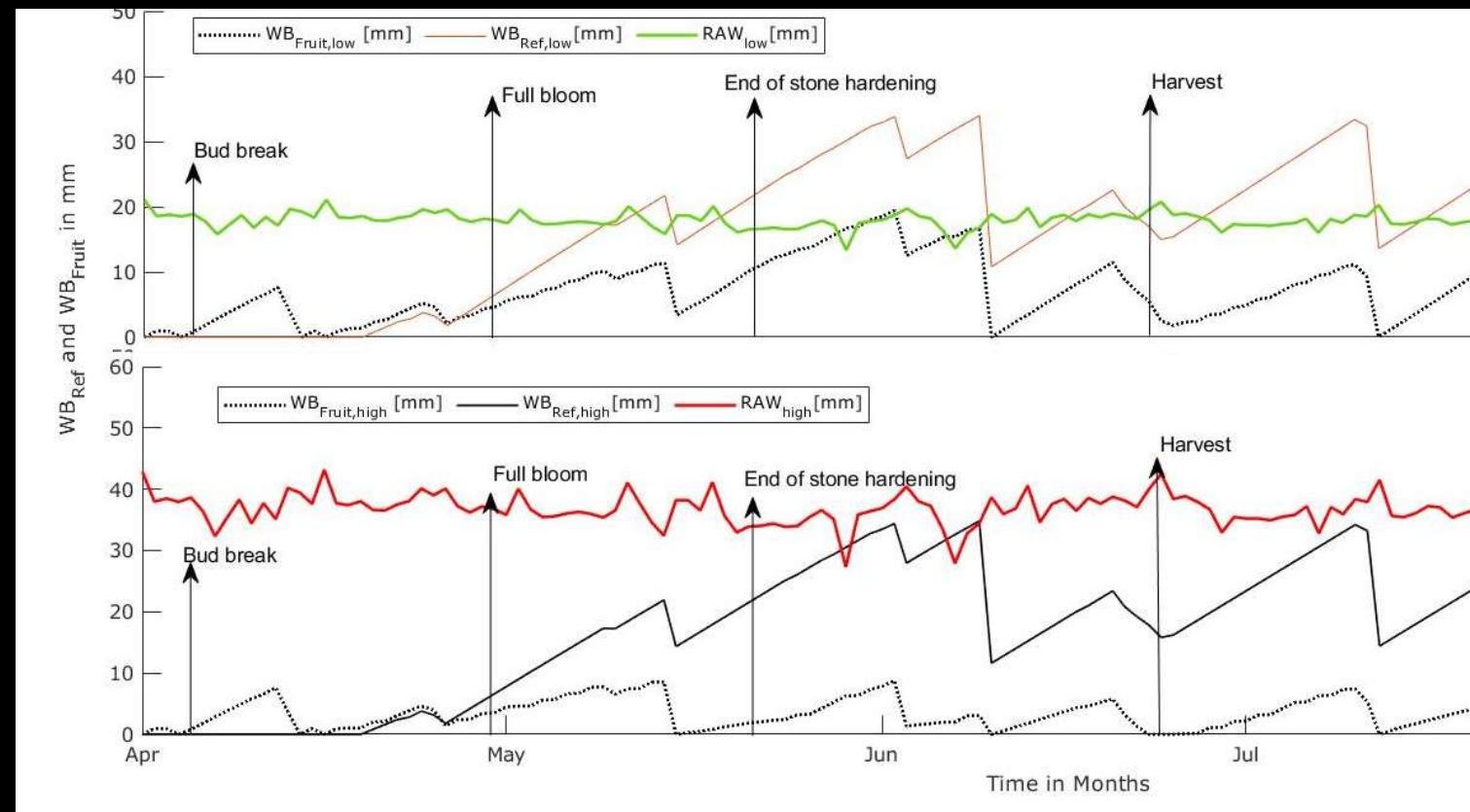
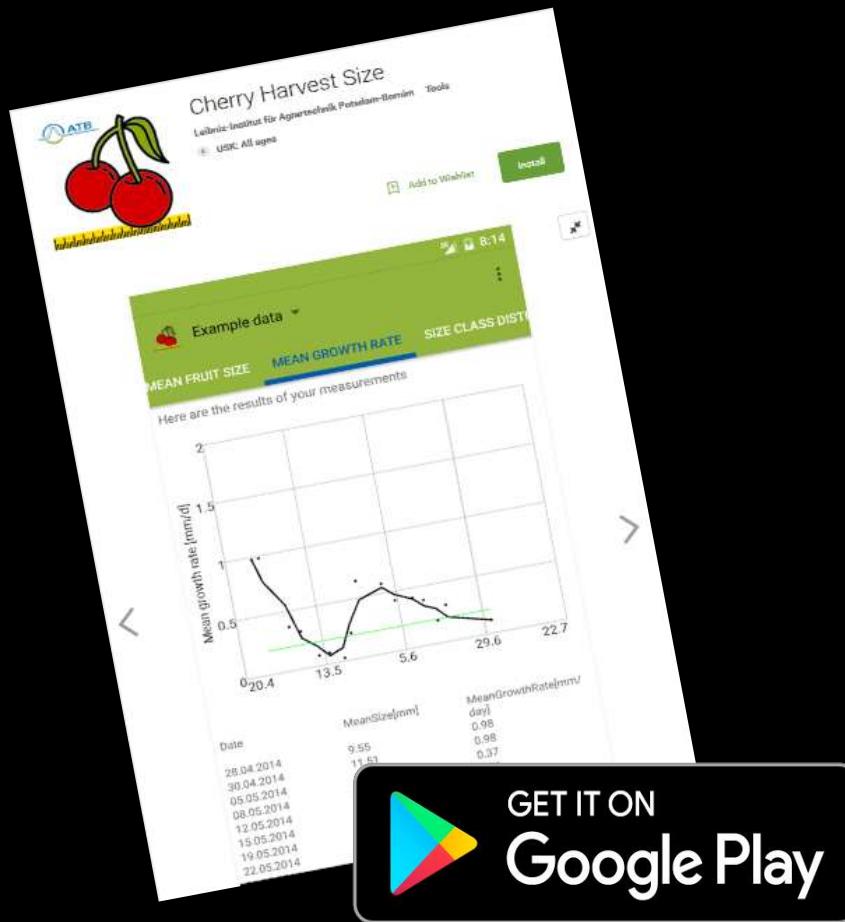


Tsoulias;Paraforos;Xanthopoulos; Zude-Sasse (2020).  
Remote Sensing. <https://doi.org/10.3390/rs12152481>



# Irrigation: Plant data

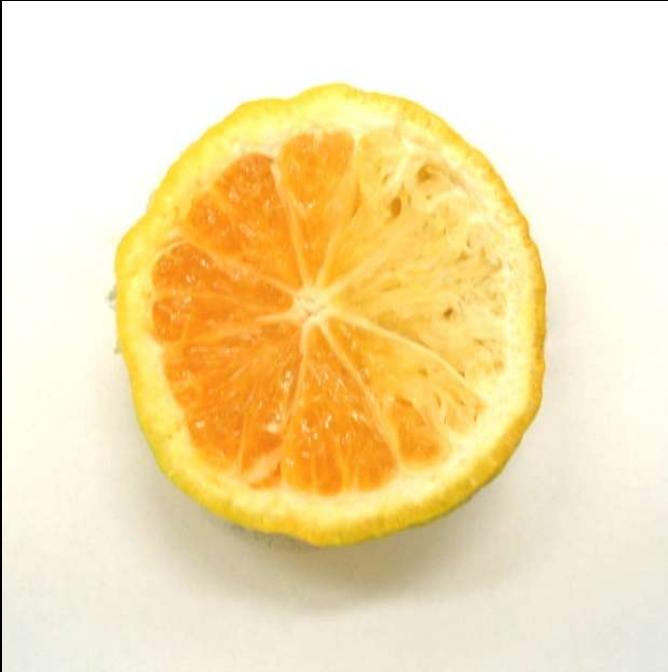
But plant data: MEDIUM spatial resolution & high temporal resolution



Tsoulias; Gebbers; Zude-Sasse (2020).  
Precision Agriculture. doi.org/10.1007/s11119-019-09680-8

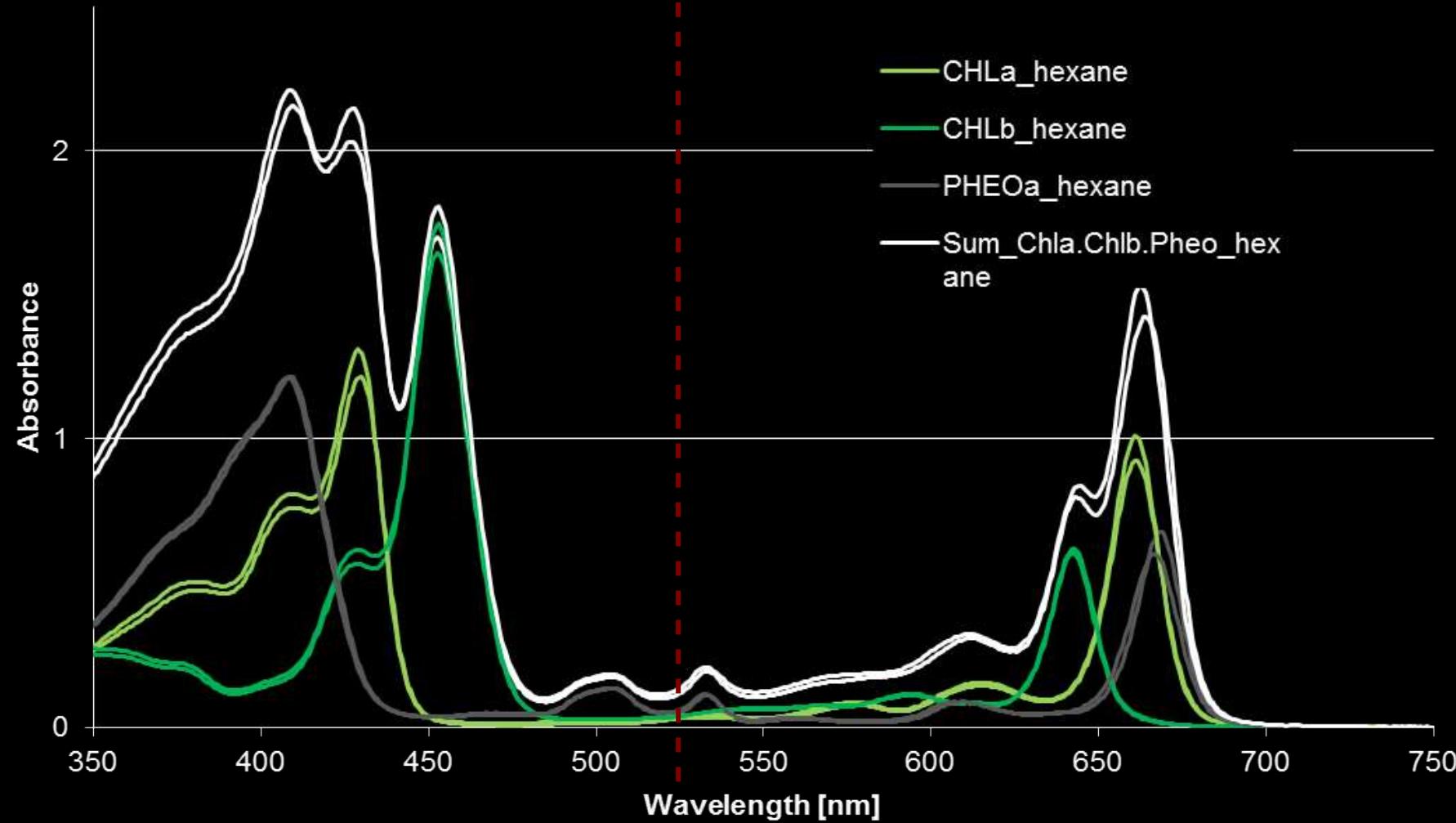
## 2. Heat stress

**MEDIUM spatial resolution & HIGH temporal resolution**



# Heat stress

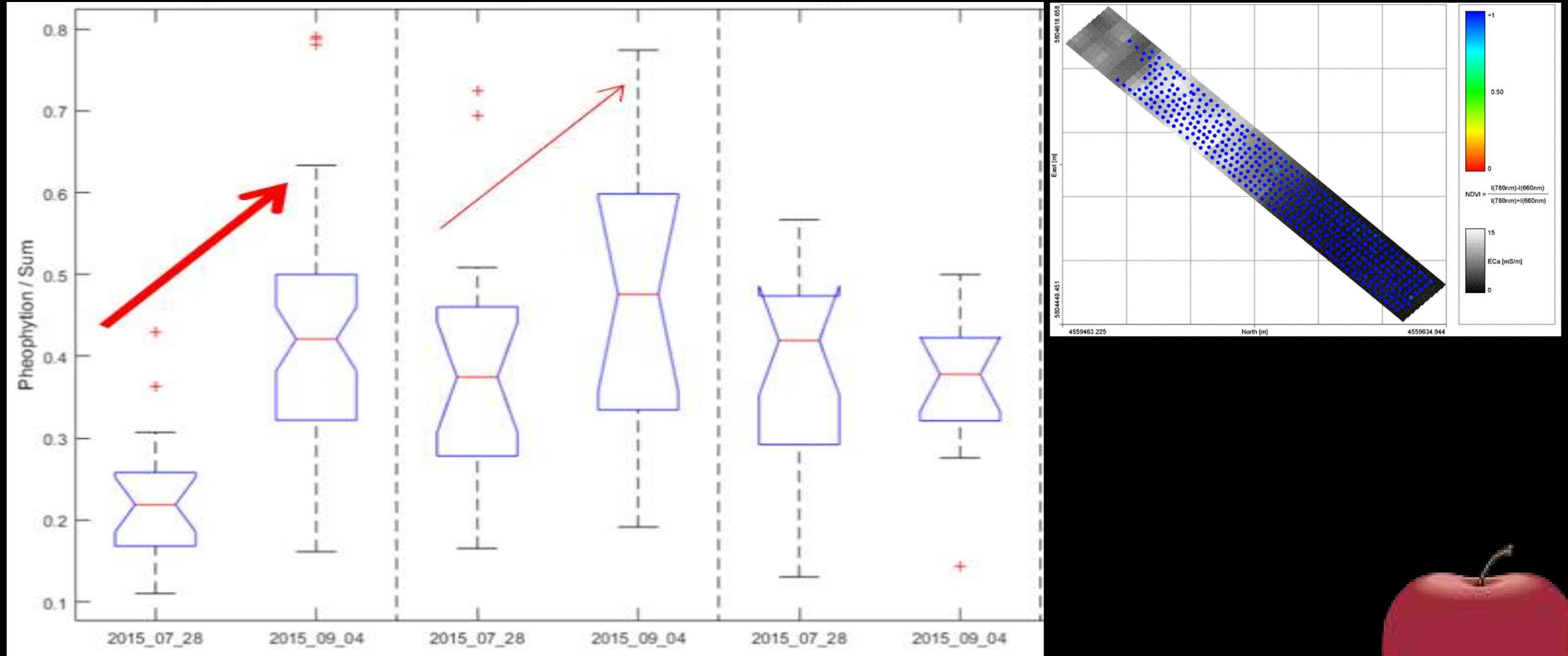
Anthocyanins



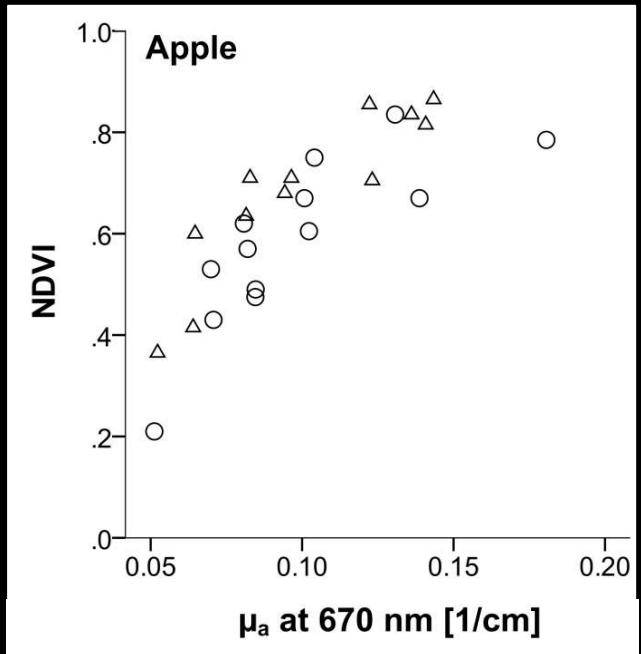
Pflanz, Zude (2008). Applied Optics 47: 5961-5970

Seifert, Regen, Zude (2014). Food and Bioprocess Technology 7: 2050–2059

# Heat stress



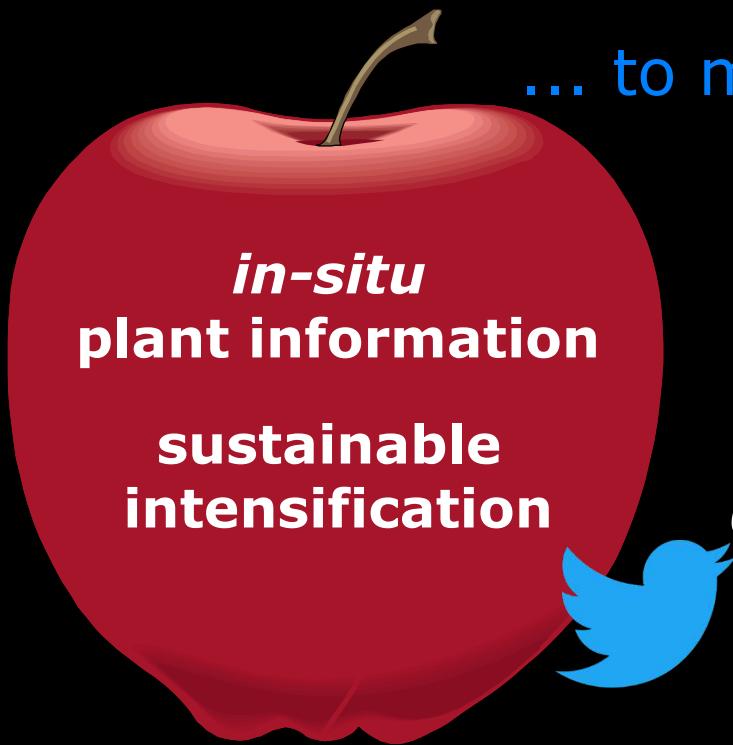
# 3. Implementation for harvest decision



FIORAMA mobile App, 2020



More ...  
robust automated sensors,  
physiological models, and  
integration in processes



@Prec\_Hort

... to make life easier.

