

## Heike Bach

PhD in 1995 on the derivation of agricultural and hydrological parameters from hyperspectral data

Since 1995 CEO & Founder  
VISTA Remote Sensing in  
Geosciences GmbH

since 2017 Vista  
part of BayWa AG

The logo for BayWa, consisting of a green square with the word "BayWa" in white text.

## Mission and Vision

### VISTA GmbH

Integrated solutions for  
sustainable management of the  
water-energy-food nexus

- Improve the global footprint of agriculture.
- Increase the resilience of the food system.



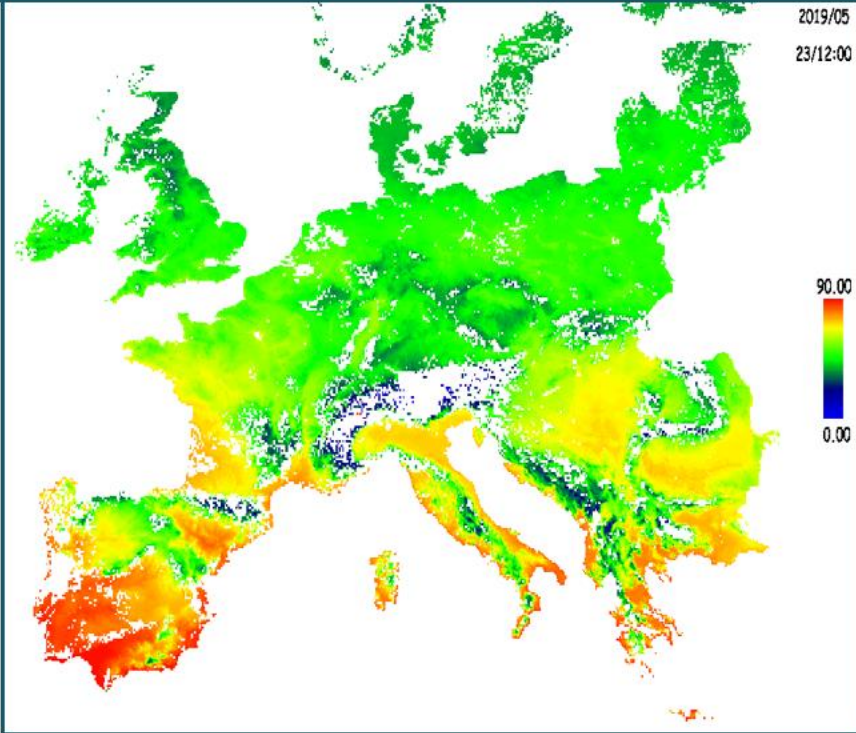
- **Methods**
- **Smart Farming**
- **Carbon Farming**
- **Why do we need hyperspectral data?**

# The Benefit of Hyperspectral Data for Smart Carbon Farming Services

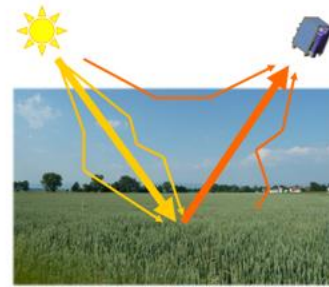
Heike Bach, Silke Migdall, VISTA GmbH



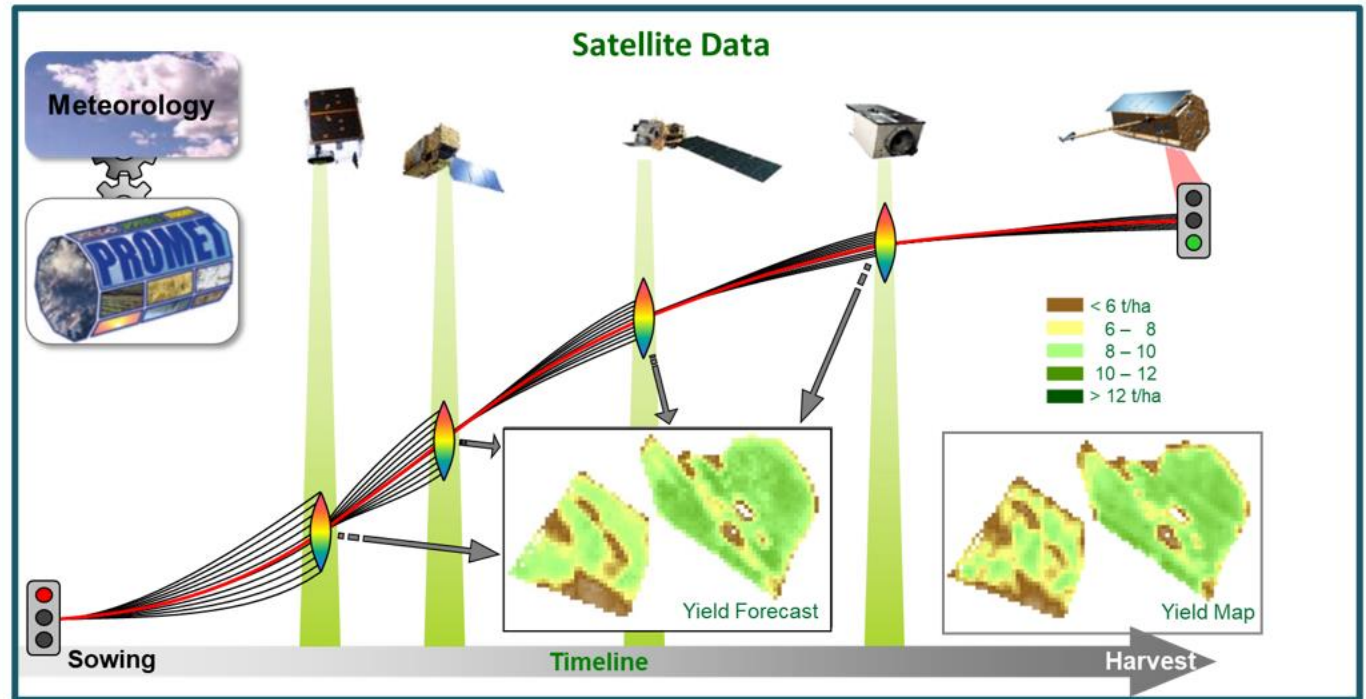
PROMET simulates crop growth, yield, the water-, carbon-, nitrogen cycles considering all relevant land surface processes under different agricultural management alternatives e.g. wheat phenology in Europe:



SLC Soil Leaf Canopy Reflectance Model

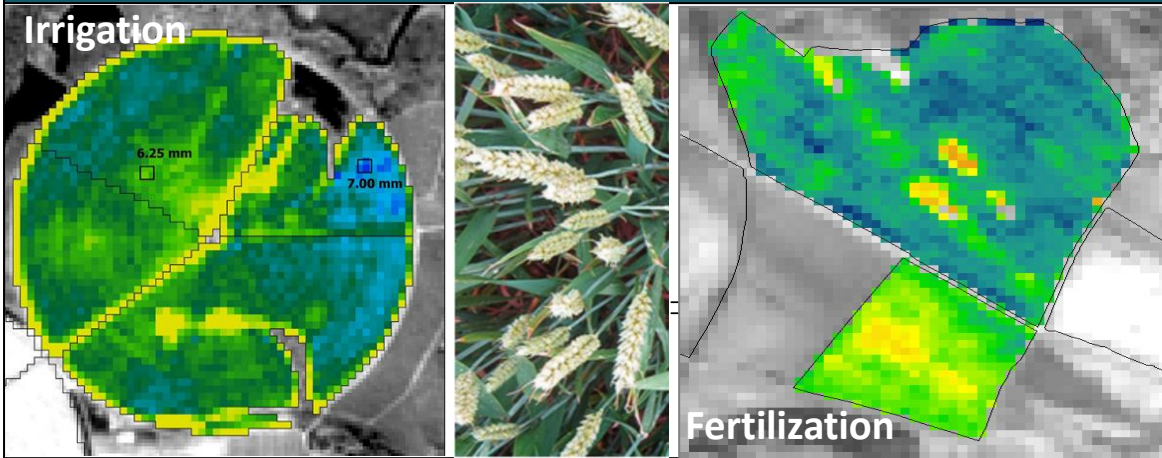


## Data assimilation approach using radiative transfer modelling for multi-temporal multi-source EO data

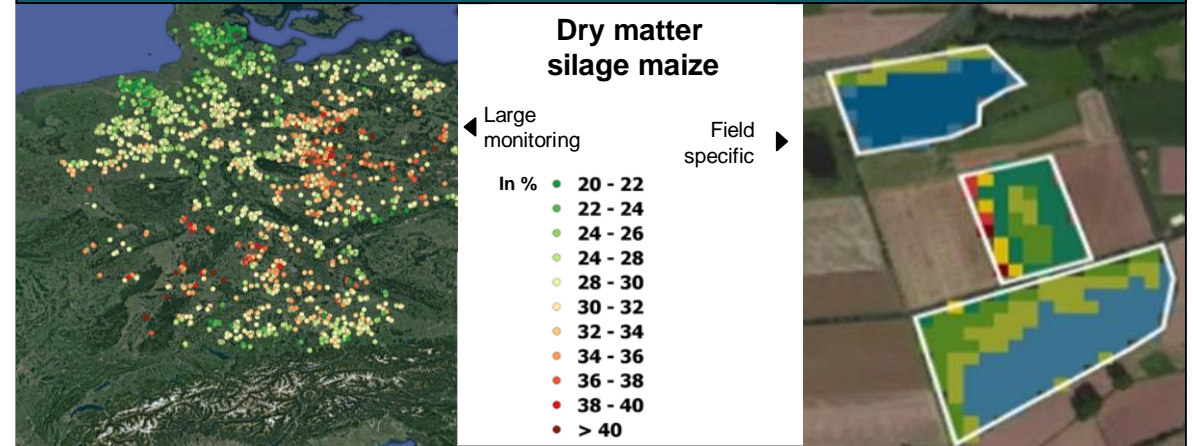


# VISTA's Operational Smart Farming Services

## Smart Farming Services: Talking Fields



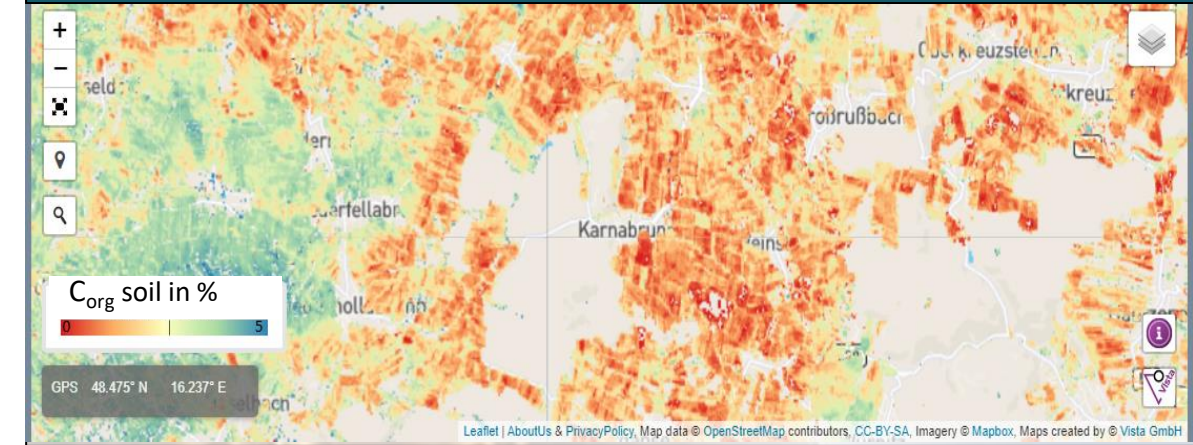
## Crop Monitoring and Risk Management



## Yield Prediction and Harvest Progress: Ypsilon

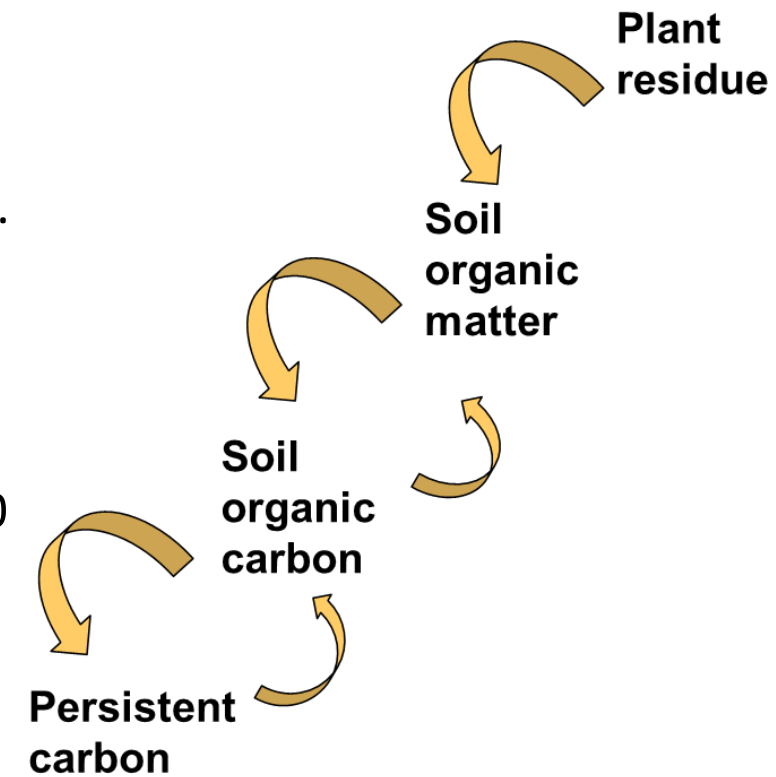


## Sustainability Services: EO4CarbonFarming

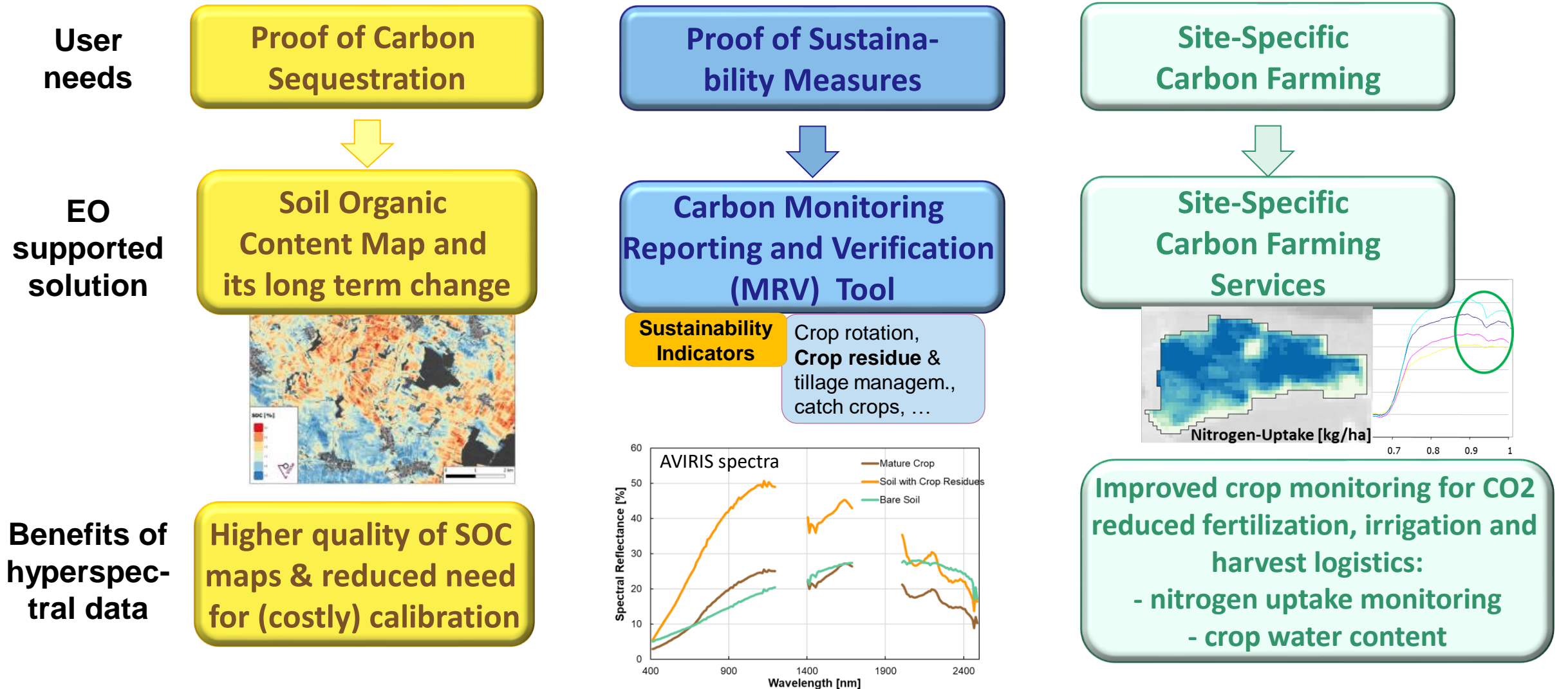


# Why is Carbon Farming so important?

- Ensuring that a growing world population can be fed with **sustainably produced food** under the conditions of climate change is one of the most important policy areas worldwide (SDG , Green Deal of the EC).
- Agriculture has a dual role: (1) as a GHG emitter the emission for food production must be reduced, (2) agriculture can contribute to solving the climate problem by accumulating carbon in the soil (**carbon farming**).
- Carbon farming is part of the EU Commission's initiative to achieve climate neutrality by 2050 and should therefore be promoted as a "**green business model**" in the future.
- **Economic** importance: Total global carbon market hit €194 billion in 2020 (<https://carbon-pulse.com/90631/>)
- **Reliable determination of field carbon stocks (soil and crop)** is key to monitoring the climate impacts of carbon farming and developing business models.



# EO contribution to Carbon Farming



# Improved Chlorophyll and Nitrogen Information for Sustainable Fertilization supported by EO data

