Managing the assimilate balance in strawberry using a data-driven crop model

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Worldwide Expertise for Food & Flowers

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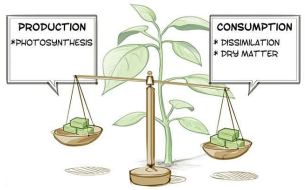
The role of assimilates

- Fundamental role in plant growth
- Available assimilates are divided
- Balance is key
  - Shortage: small fruits, bad quality, hindered truss development, flushes
  - Surplus: Excessive vegetative growth, problematically high future plant load



Bron: https://www.plantempowerment.com

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Crop modelling in strawberry

- Genotype X environment = Phenotype
- Up-to-date crop information
  - Leaf area, number of fruits, stage of ripening, etc.
  - Digital twin
- Calculations of internal plant processes
  - Light, CO_2 and Temperature effects on photosynthesis
  - Usage of assimilates
- Optimize cultivation strategy and learn from earlier cultivations

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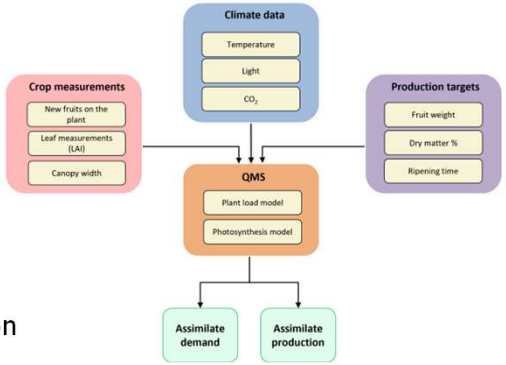
Crop modelling in strawberry

- Input
  - Crop
  - Climate
  - Targets
- Output
  - Assimilate demand
  - Assimilate production



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New crop registration protocol

- Goal: Efficient method to track all strawberries individually
- Rings are used to mark the setting date

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The assimilate balance in practice

- Data of the cultivation in compartment 2
- Working together with pilot growers, ISFC and IC to build and improve the model

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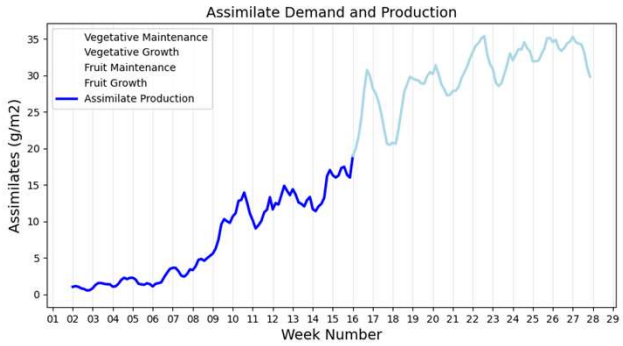
The assimilate balance in practice



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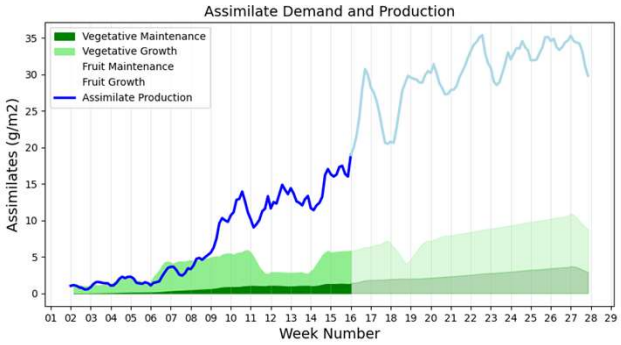
The assimilate balance in practice



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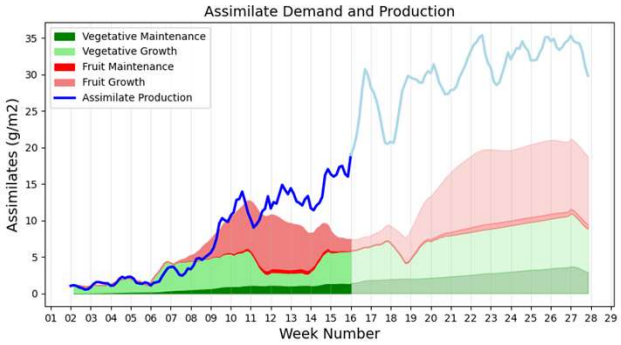
The assimilate balance in practice



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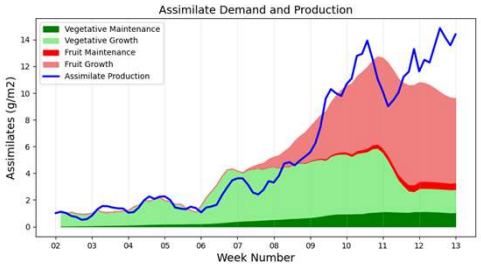
Zooming in on the start of the cultivation

- Some shortages in the first couple of weeks
- Leaf growth hit a pause



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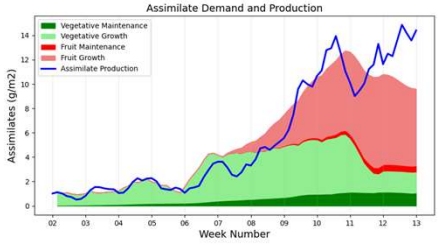
Zooming in on the start of the cultivation

- What to do?
  - Increase CO2
  - Lower temperature
  - Increase lighting
  - Change crop strategy
- And in which quantity?
- In practice options are often limited
- A good cultivation plan at the start minimizes the potential disbalance



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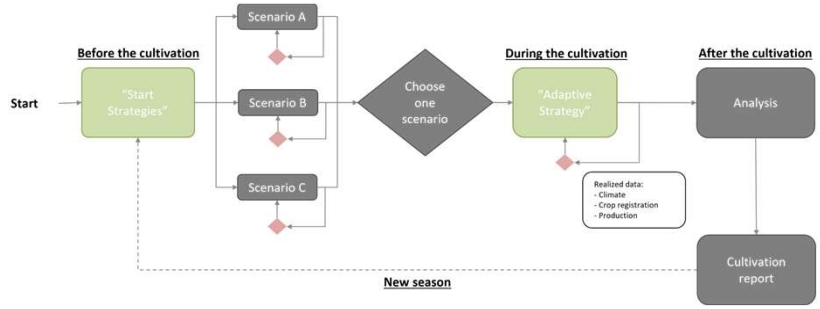
The data-driven approach



- Get a grip on your cultivation

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Summary

- Assimilates are fundamental to crop growth
- Crop modelling as a cultivation optimisation tool
- We developed a new crop registration method
- The assimilate balance provides insights and supports decision making
- A data driven approach allows for a better overview and grip on your cultivations

This is our approach, what should the value of data-driven growing be according to you?

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