Data-gedreven telen: beslissingsondersteuning via fysiologische plantmodellen, sensor reductie

November 12th, 2026

Johan Kon, Maarten van der Meer

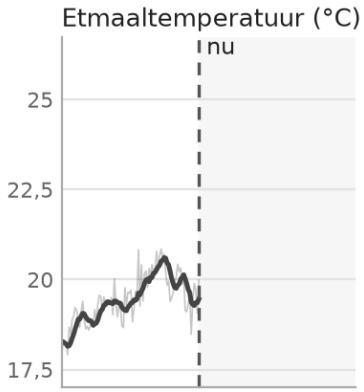
WAGENINGEN
UNIVERSITY & RESEARCH

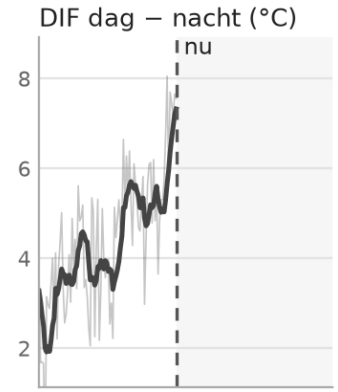
NXT GEN hightech

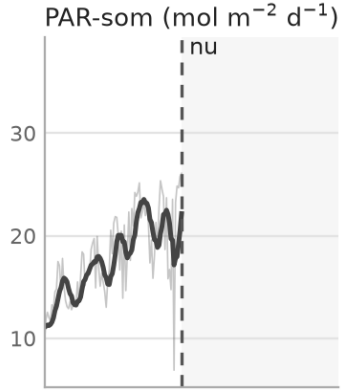


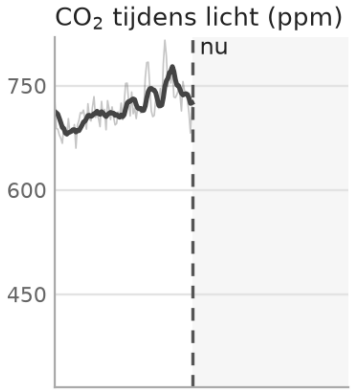
Het is 2 april. Teeltbeslissing op basis van data?

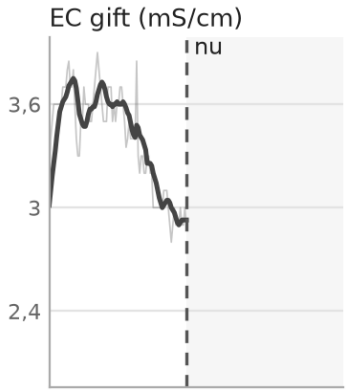
Klimaat

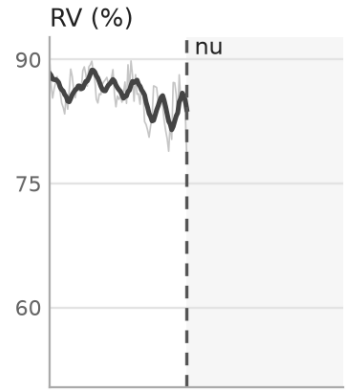




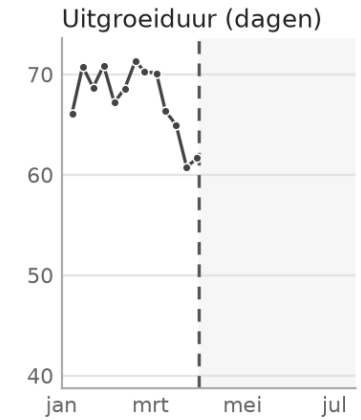


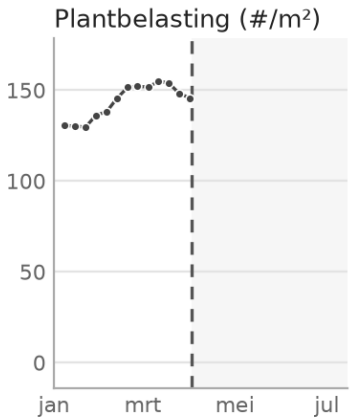


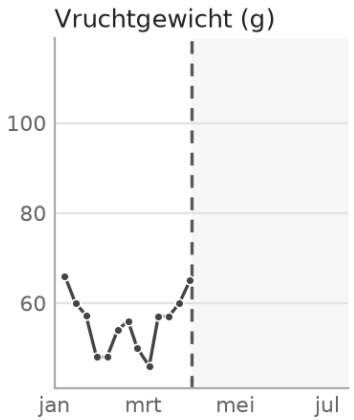


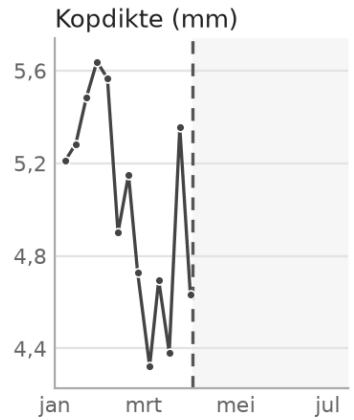


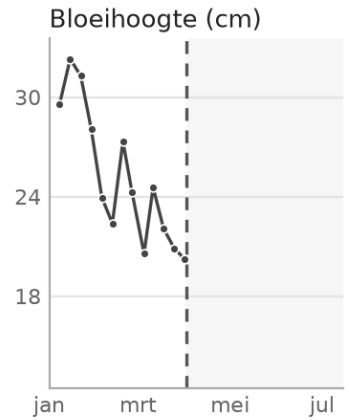
Gewas

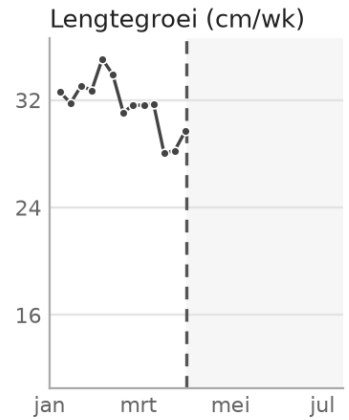








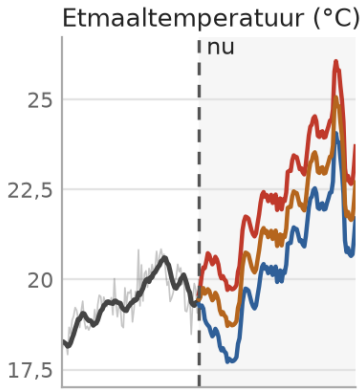


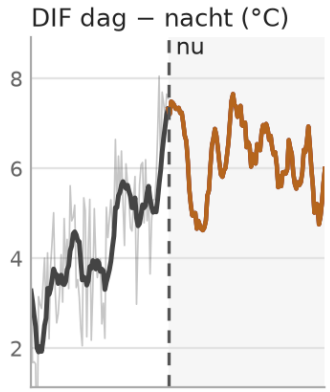


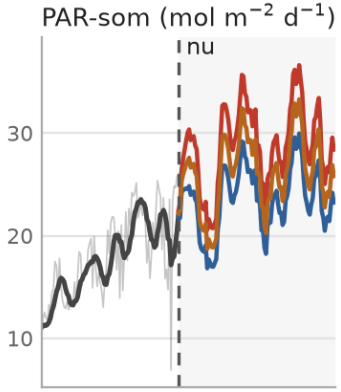
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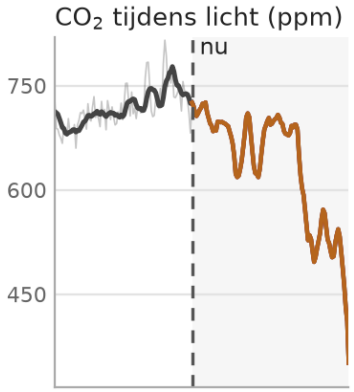
Sturen begint bij voorspellen van effect van keuzes

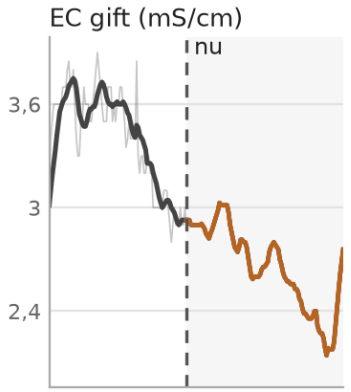
Klimaat

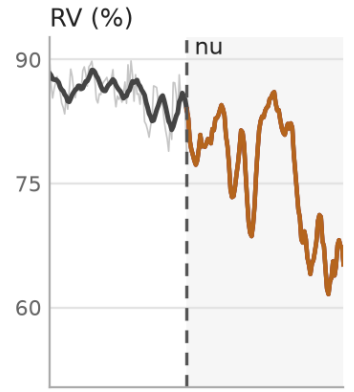




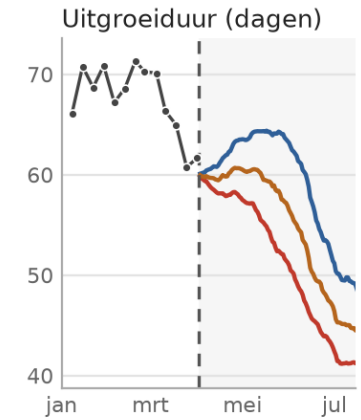


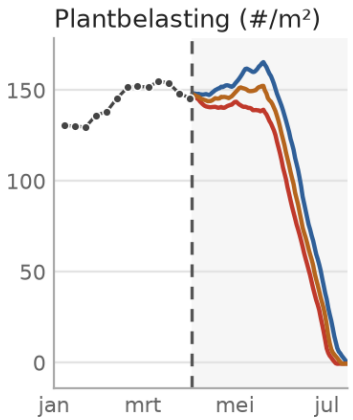


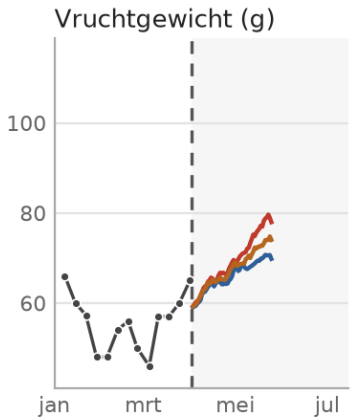


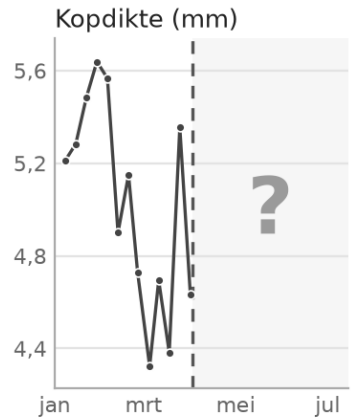


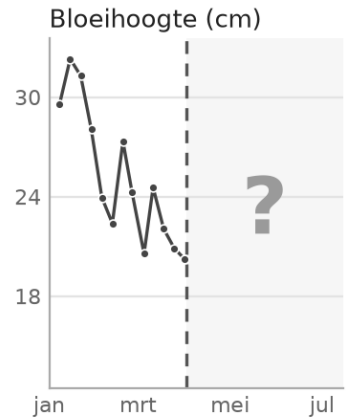
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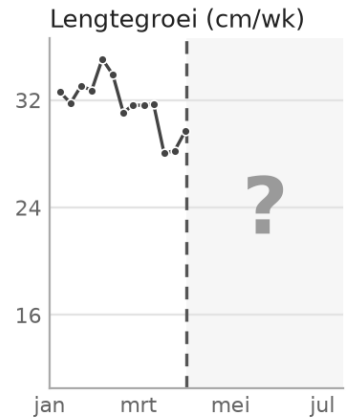






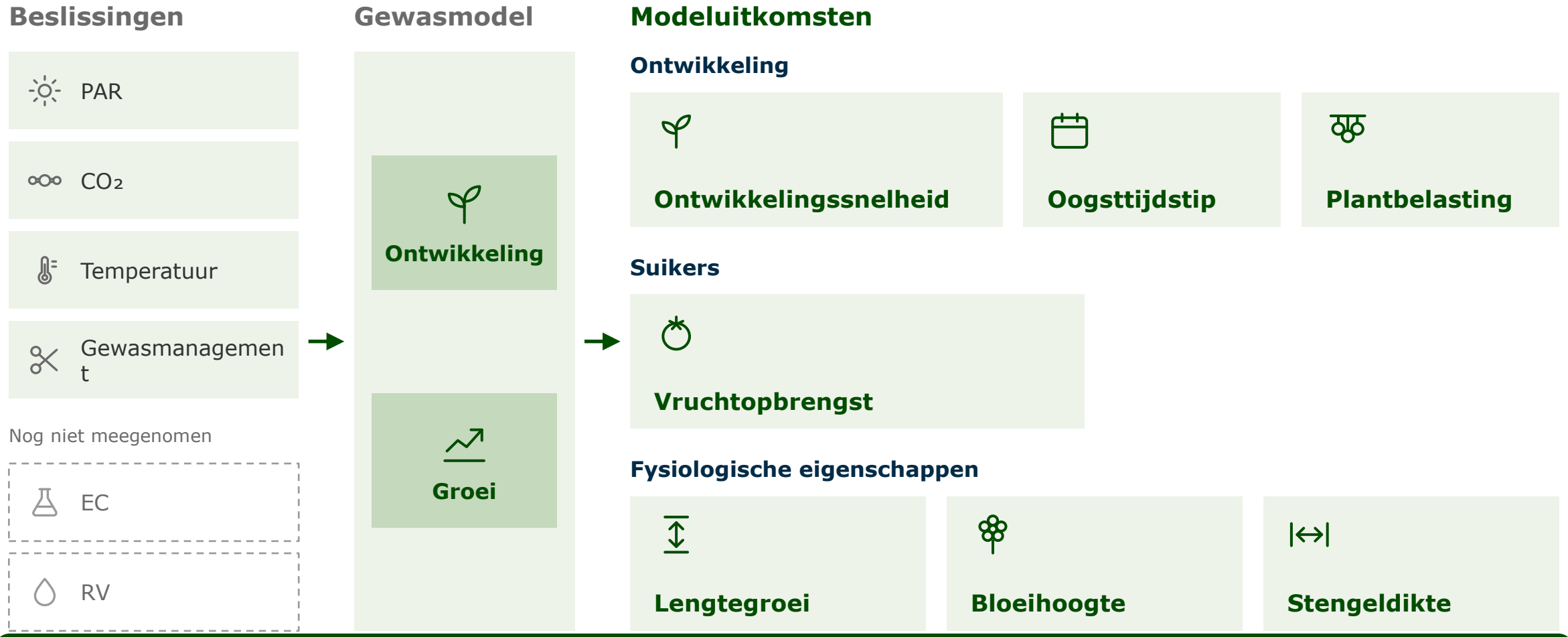






Gemeten Scenario 1 Scenario 2 Scenario 3

Model om gevolg van teeltbeslissingen te voorspellen



Inhoud

- De bouwblokken van het model
- Hoe goed zijn de voorspellingen: het model vs de data
- Onderzoek naar verbeterpunten

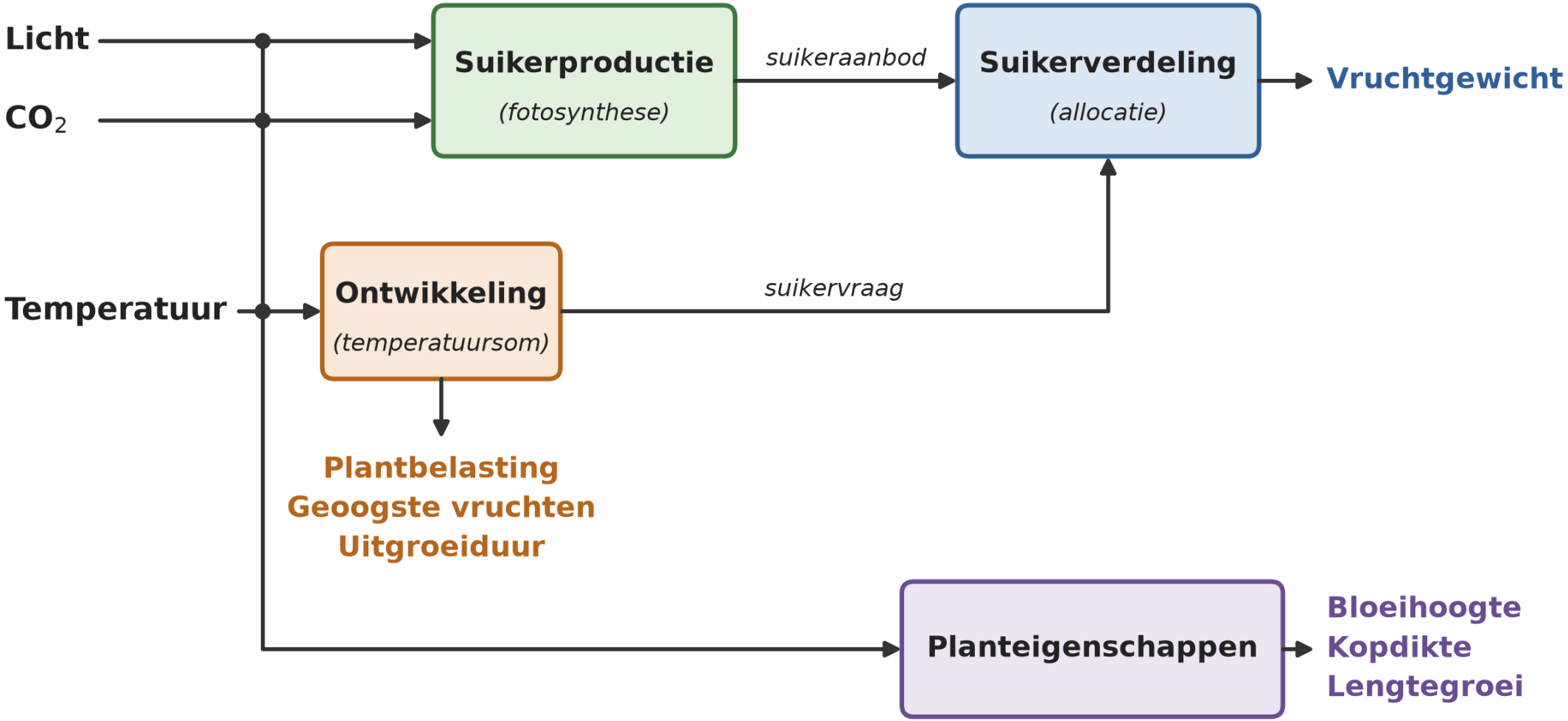
Case studie: tomatoworld

Tomatoworld teelt 2024-2025 (tros)
Huidige teelt 2026-2027 (tros, cherry)

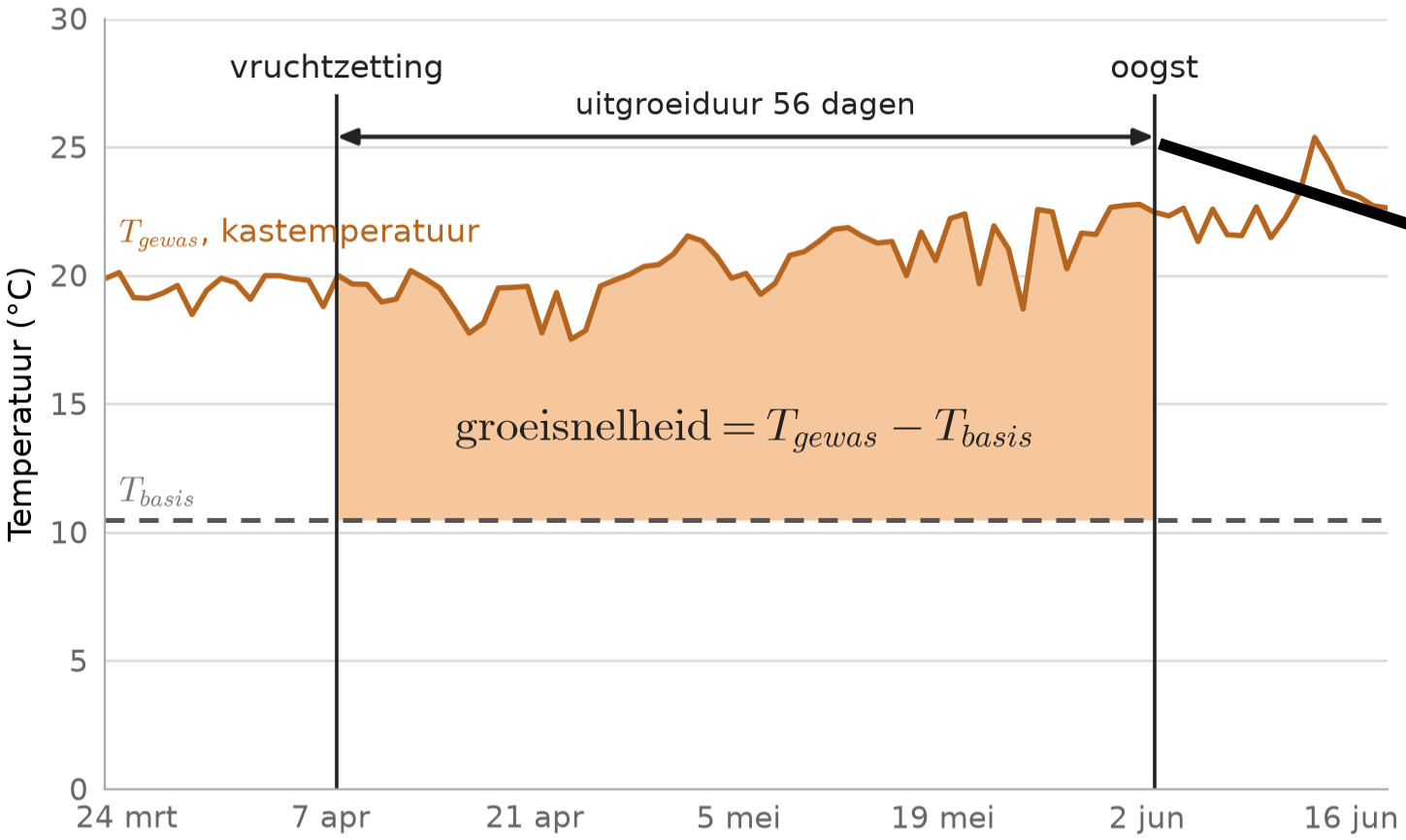


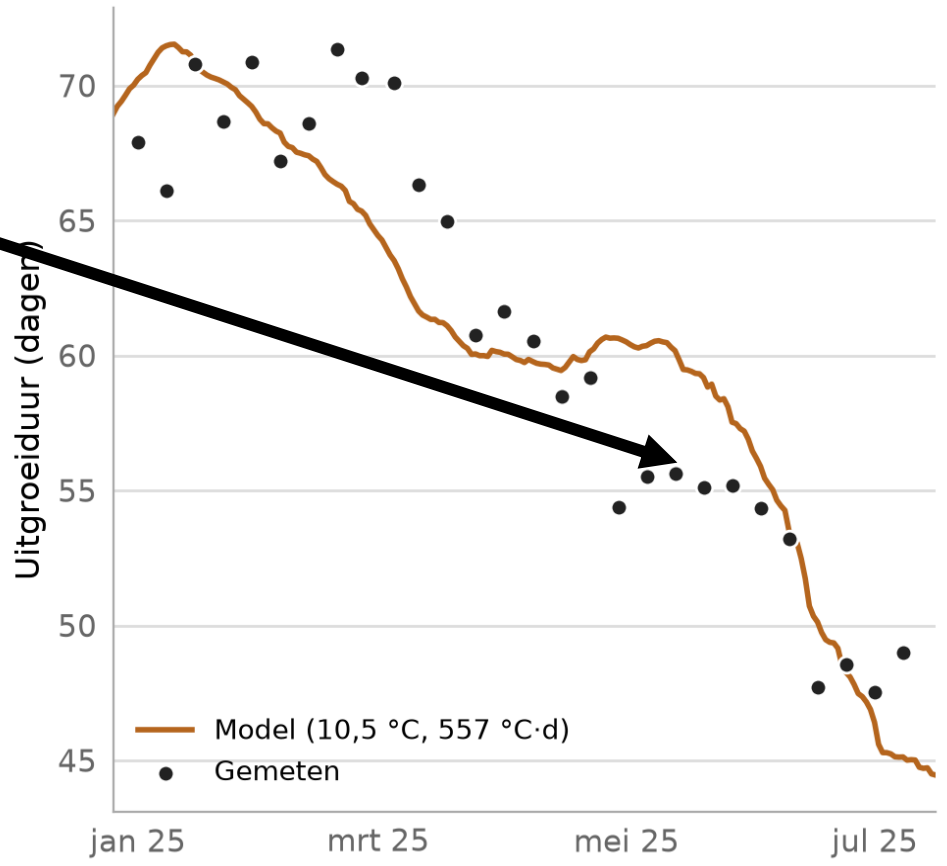


Een kijkje in een fysiologisch plantmodel

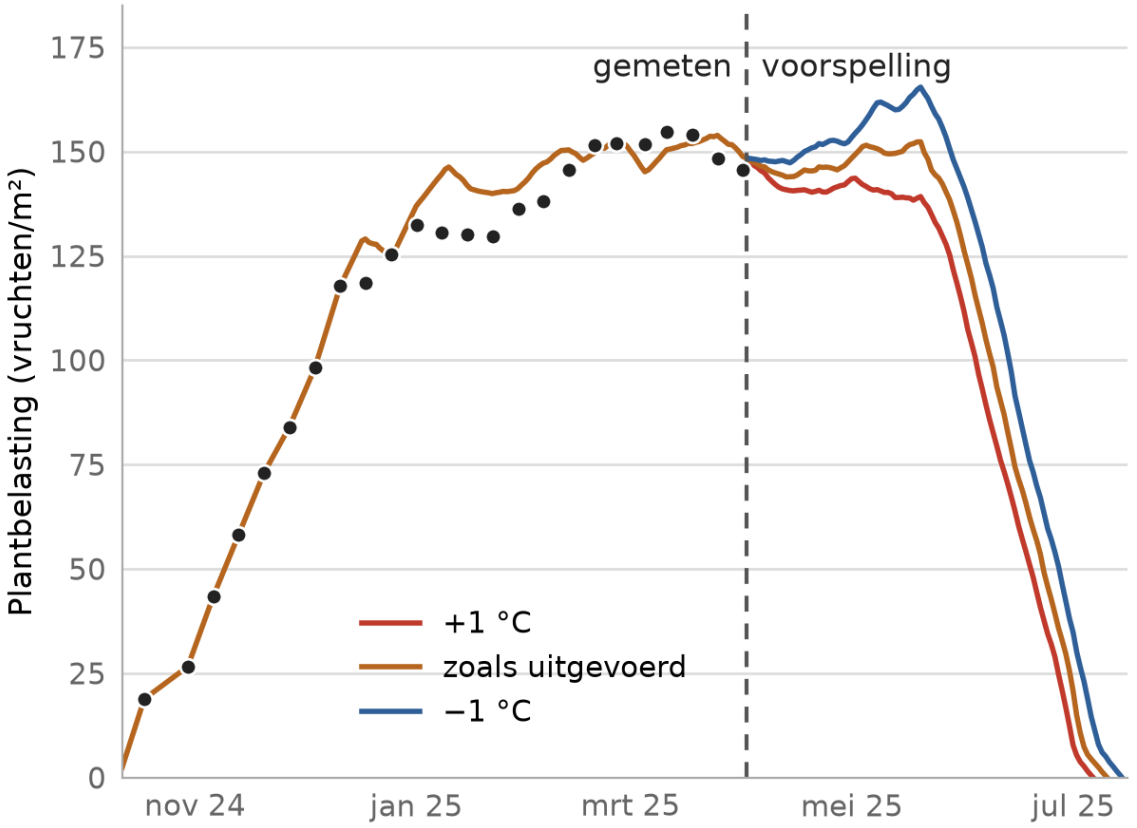


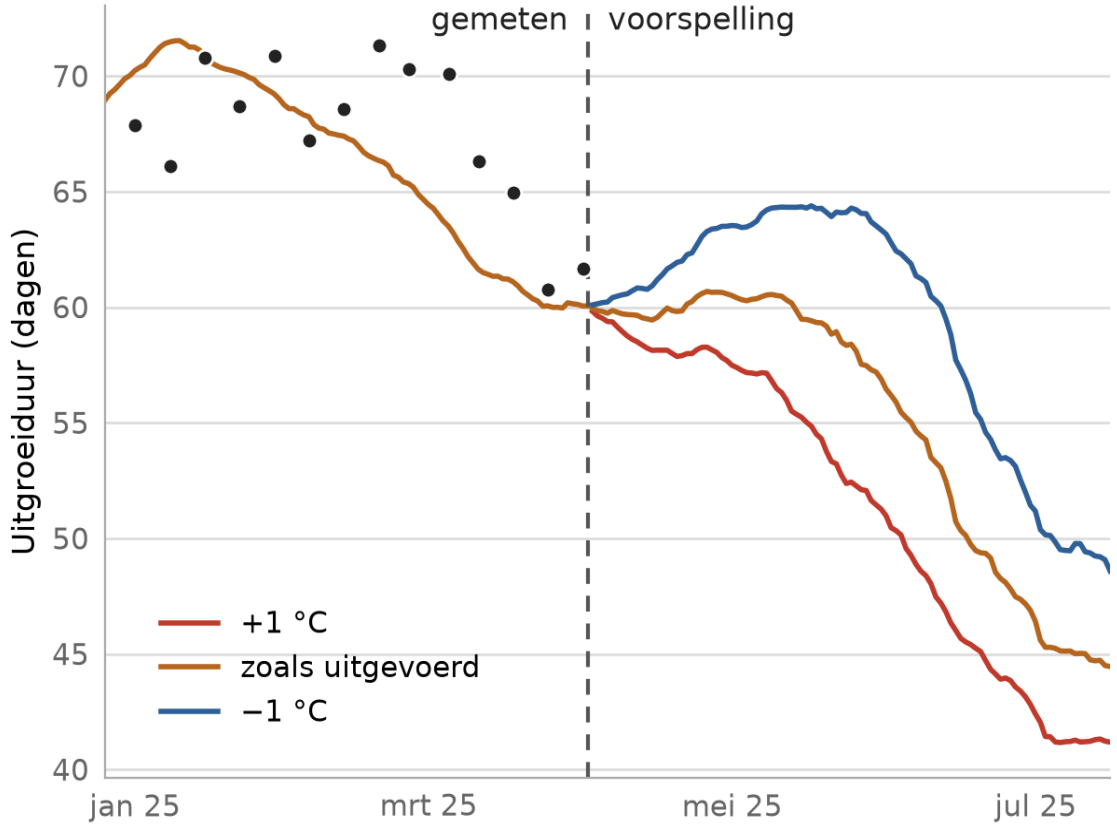
Vruchtontwikkeling laat zich redelijk voorspellen





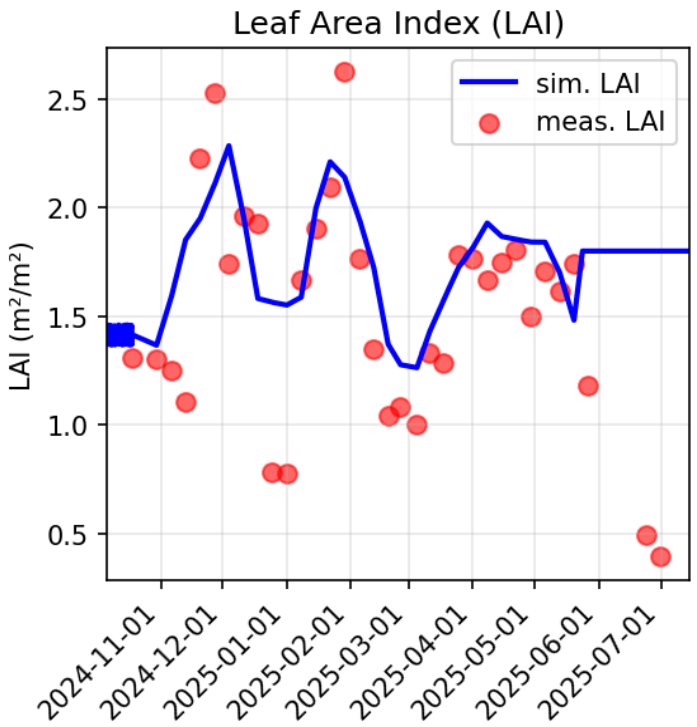
Met model kan effect van temperatuurbeslissingen op uitgroeiduur en plantbelasting worden berekend

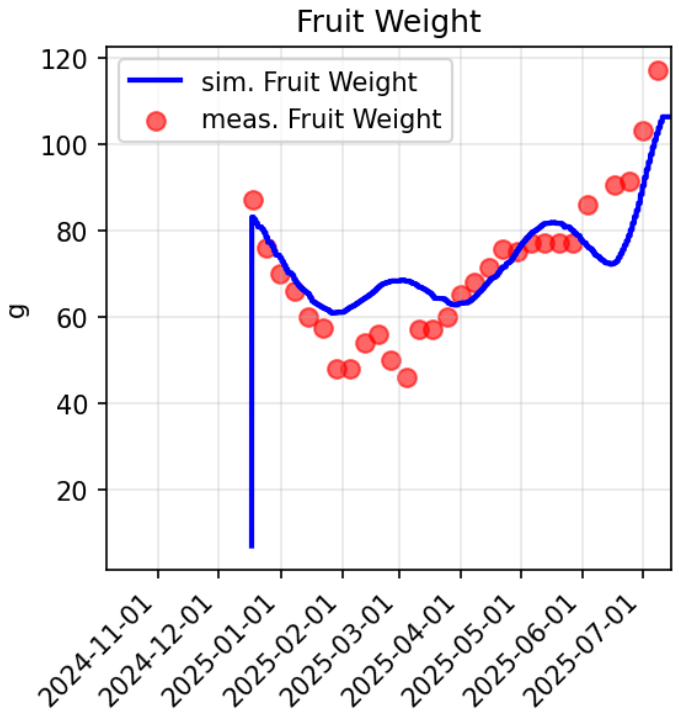




Bouwblokjes

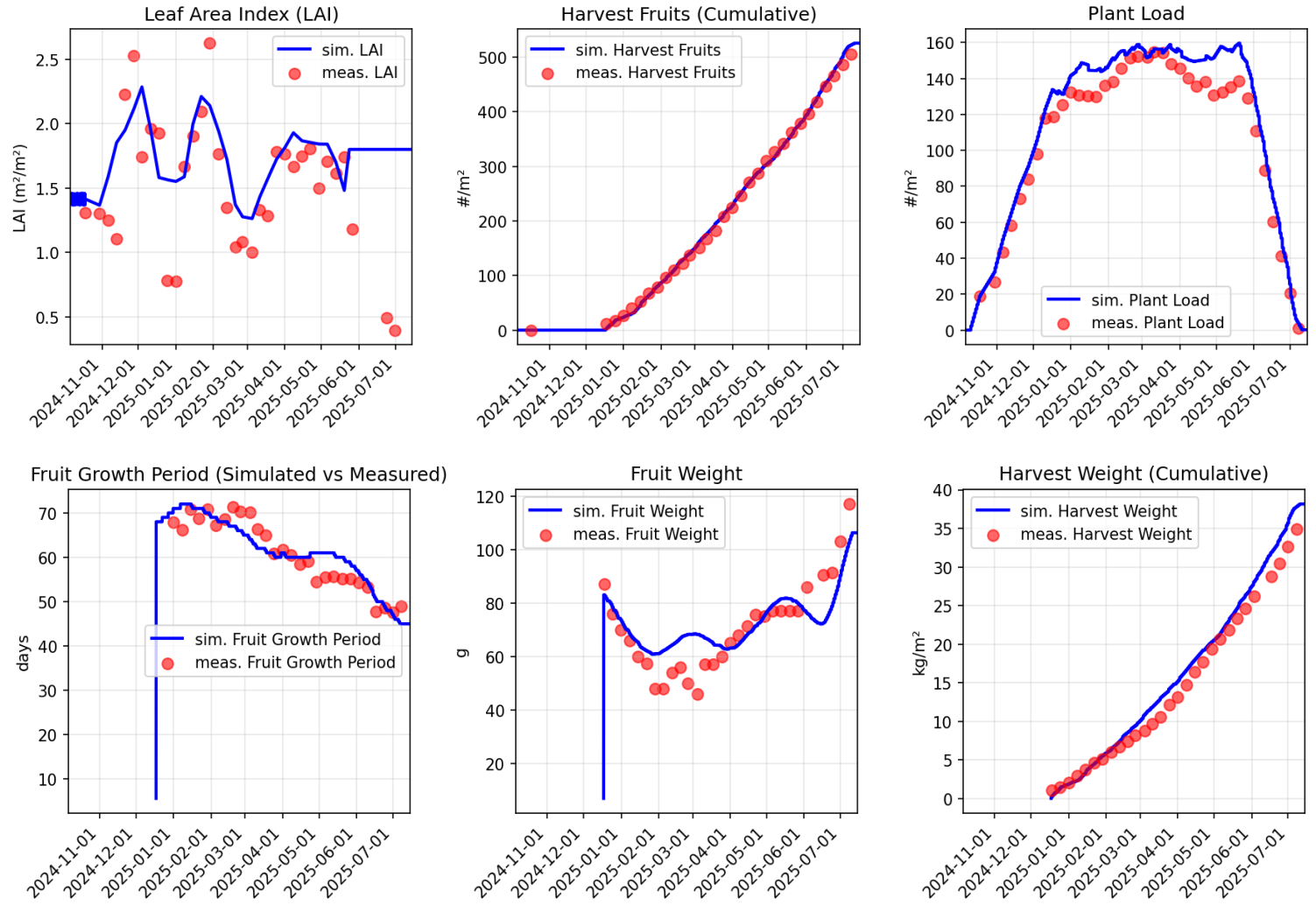
Hoeveel suikers maakt de plant, en waar gaan ze heen



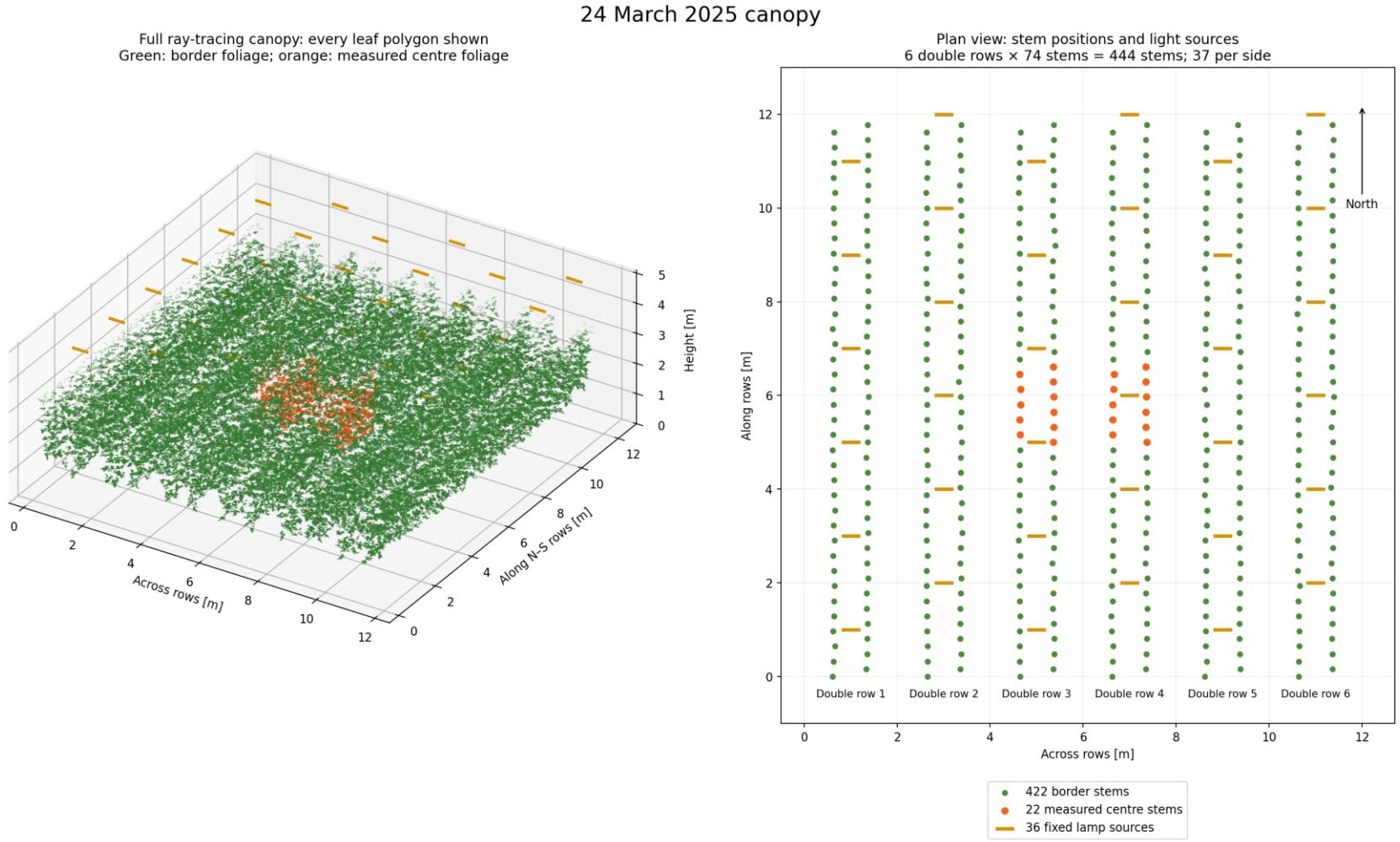


1D: hoe goed kan het

Seizoensfactor voorspellingsonzekerheid

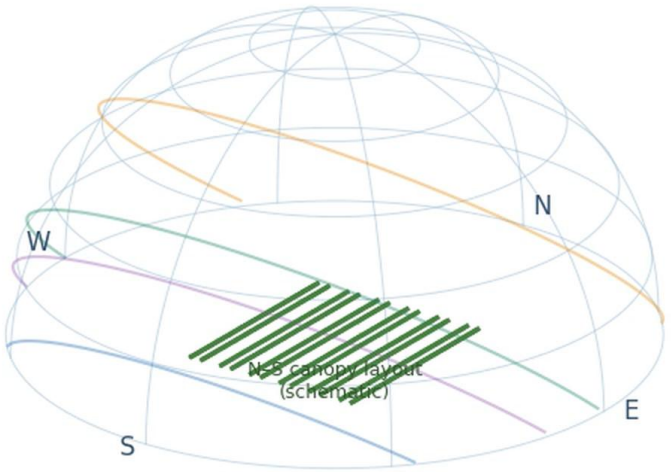


Seizoensfactor: lichtverdeling?

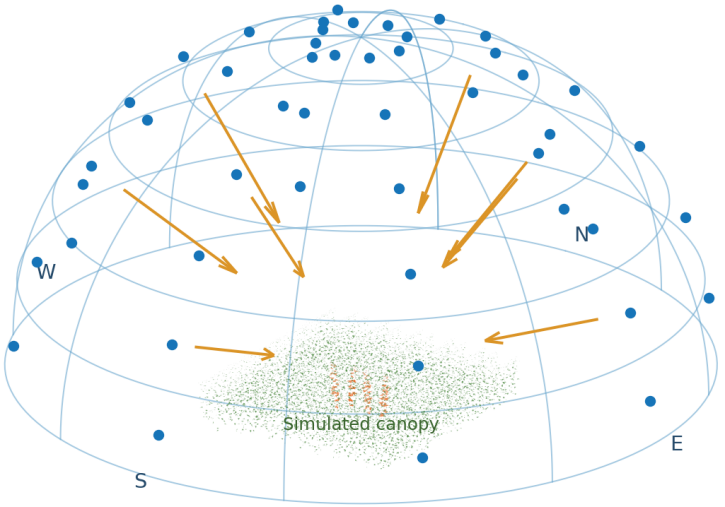


Seizoensfactor: lichtverdeling?

Sun directions different seasons

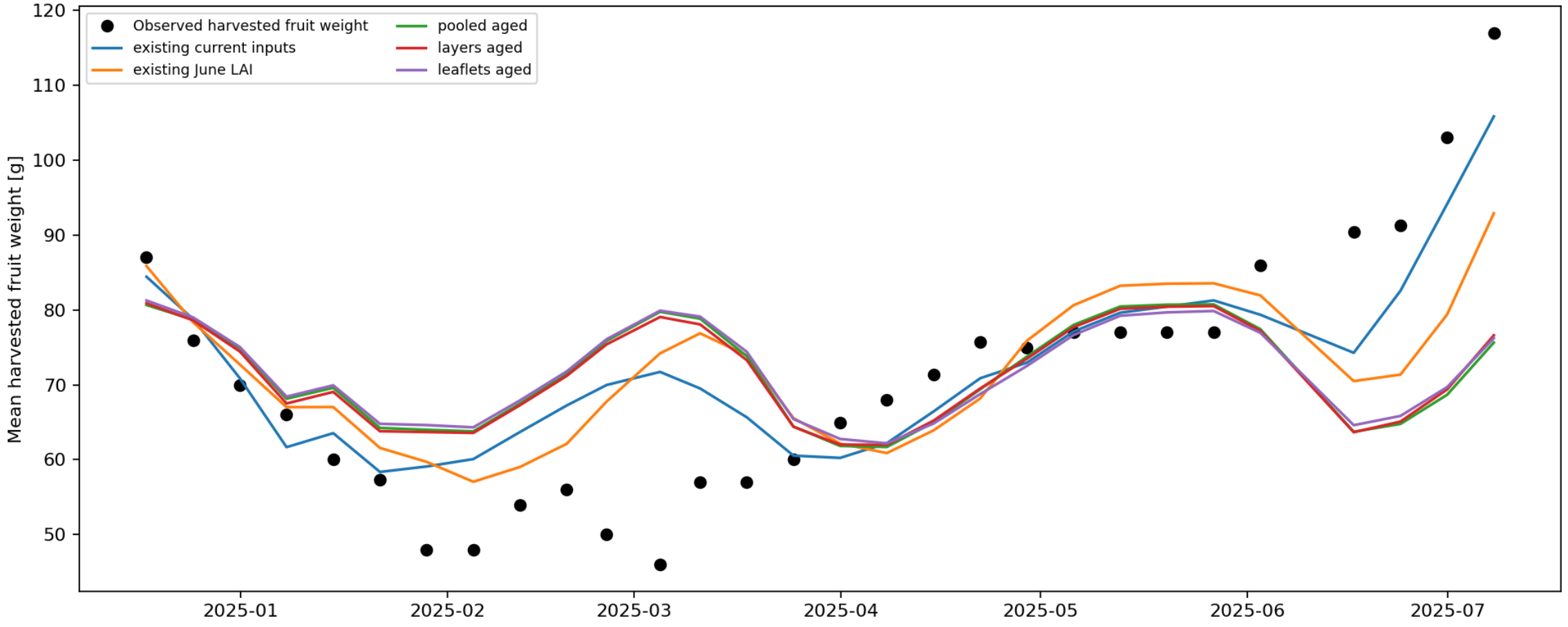


15 Oct 2024
21 Mar 2025



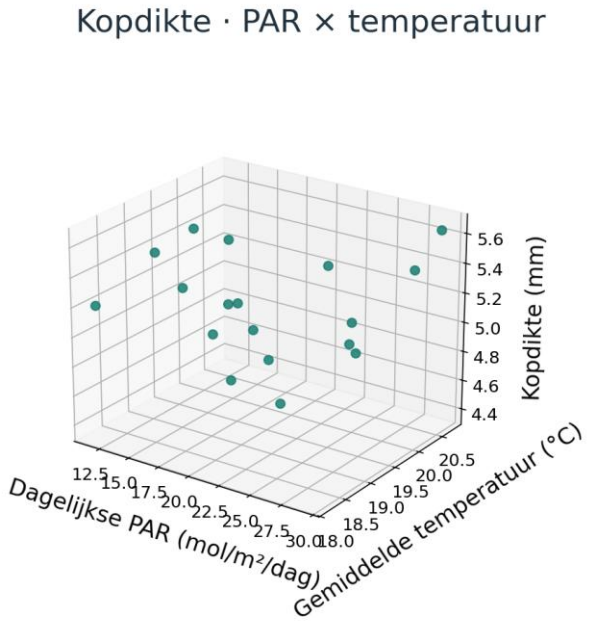
21 Dec 2024
21 Jun 2025

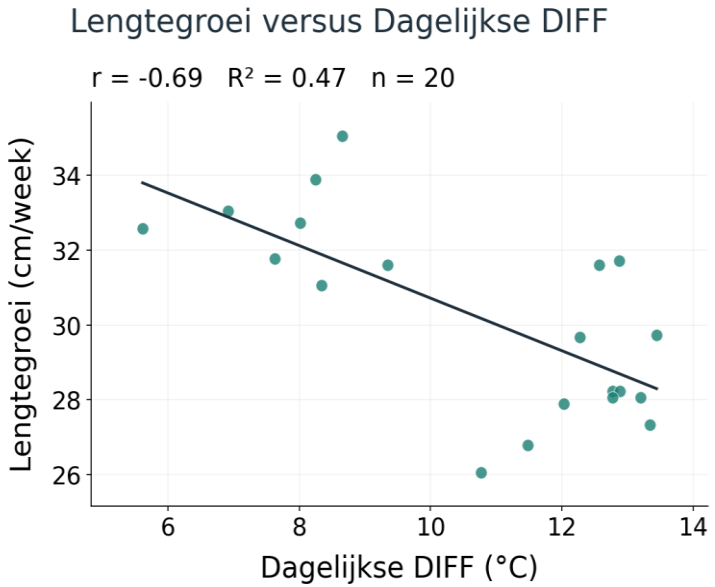
3d licht simulatie verklaart seizoenlijkheid niet

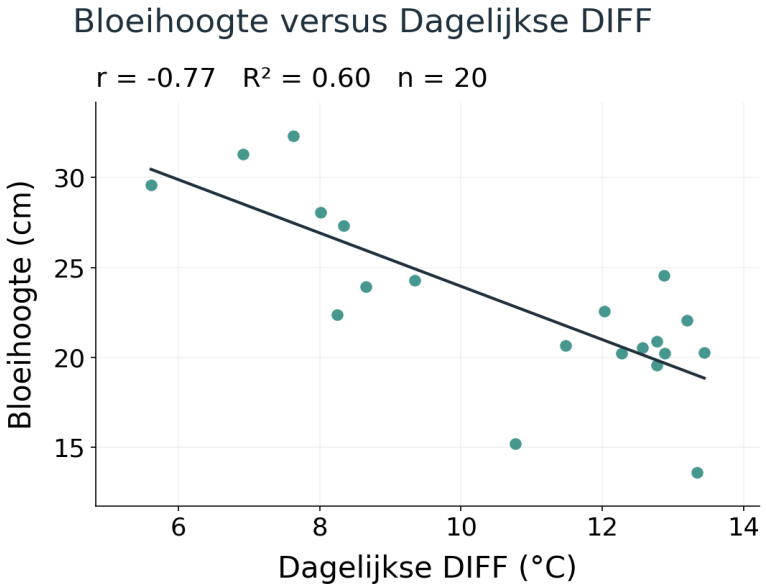


Plantindicatoren

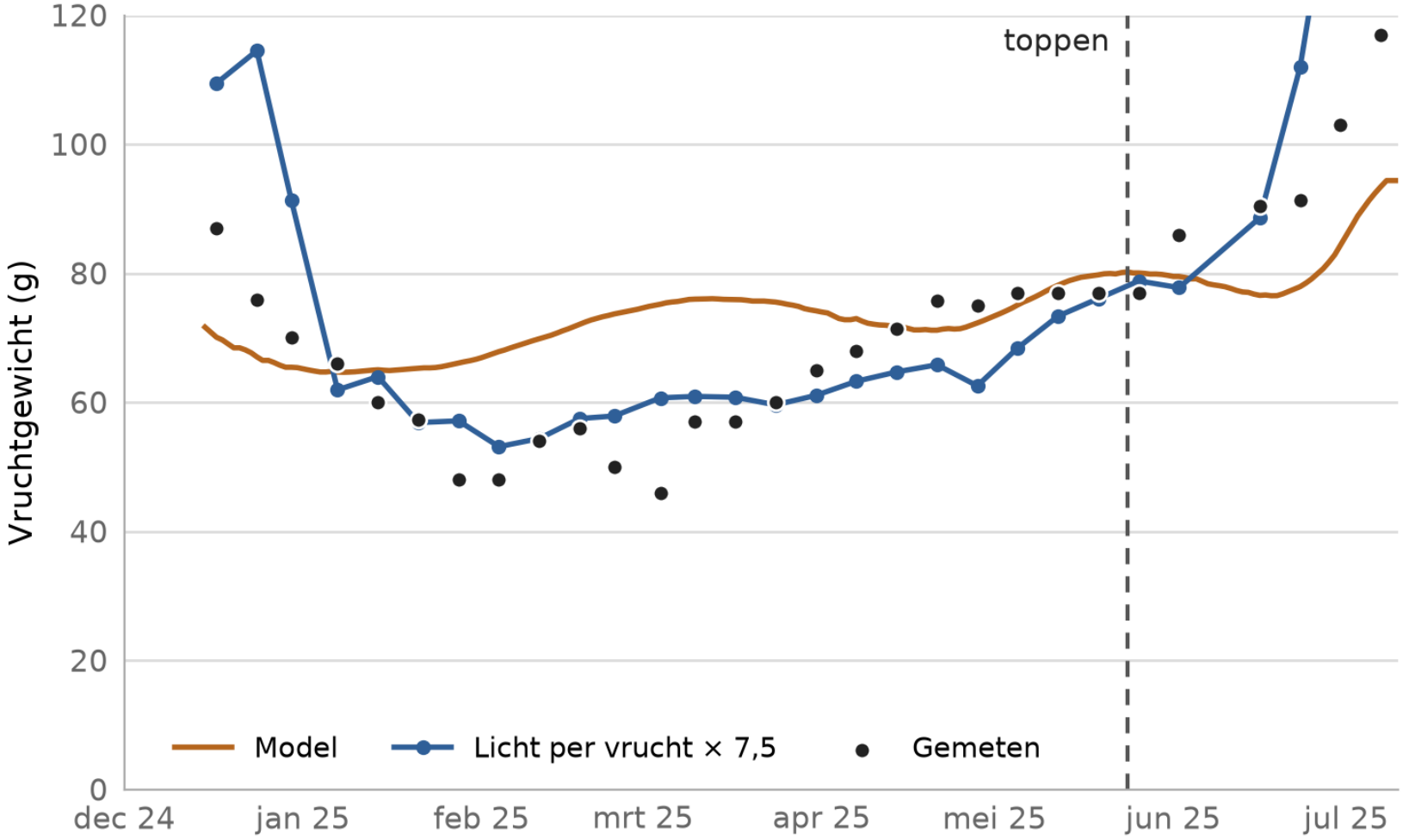
(On)voorspelbaarheid







Het model vs een LUE benadering



Conclusie

- Voorspelbaar: ontwikkeling, oogst & plantbelasting
- Indicatoren lengtegroei en bloeihoogte voorspelbaar (tot 60%), stengeldikte niet
  - Andere indicatoren niet bekeken
- Huidig gewasfysiologie model kan niet het seizoenseffect voorspellen om binnen de bandbreedte te komen van +/- 10g
  - Welk effect zit hier dan wel?
- Toekomstperspectief
  - Datasets voor jaar tot jaar evaluatie, meetfrequentie voor statistiek

Conclusie

Variabelen

- PAR
- CO_2
- Temperatuur
- Gewasmanagement

Nog niet meegenomen

- EC
- RV

Gewasmodel

- Ontwikkeling
- Groei

Modeluitkomsten

Voorspelbaar

- **Ontwikkelingssnelheid**
- **Oogsttijdstip**
- **Plantbelasting**

Deels voorspelbaar (~60%) · niet consistent tussen teelten

- **Lengtegroei**
- **Bloeihoogte**

Nog onverklaard

- **Vruchtopbrengst**
  Seizoenseffect onverklaard
- **Stengeldikte**
  Geen correlatie