A year-round future-proof blackberry cultivation

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Fieldday 2025

Worldwide Expertise for Food & Flowers

Aim project

- Future-proof blackberry greenhouse cultivation

- Learning goals:
  - Implement HNT → towards fossil free
  - Insights in light stress, water stress & photosynthesis
  - Cultivation concept with small DIF and high RH

→ Learning goals to fine-tune cultivation towards a future proof concept

KAS ALS ENERGIEBRON

Stichting Kennis in je Kas

Ministerie van Landbouw, Visserij, Voedselzekerheid en Natuur

Glastuinbouw Nederland

Fruit Masters.

the Greenery

svensson

Innovation Partners
collaboration as a driving force for soft fruit innovation

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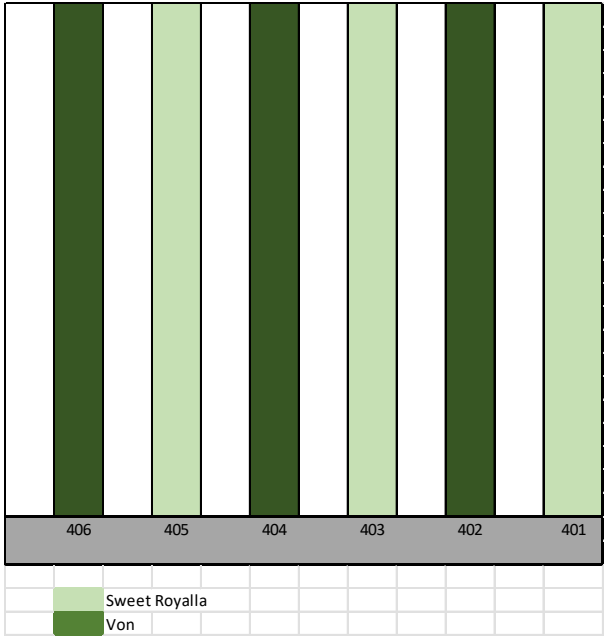
About the trial

- Two plantings: autumn and spring cultivation
- Plantdate autumn: 5 July
- Plantdate spring: 16-21 January
- Focus on flavourful varieties:
  - Sweet Royalla
  - Von
- Plant density:
  - 1 pot per 0,6m1 or 1 pot per 0,4m1
- Targets:
  - Year production 10 kg/m^2
  - Max. 5 m^3 gas/m^2
  - Minimize CO_2 inputs



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Cultivation targets

- Cultivation
  - Optimising climate
    - RTR strategy
    - High pressure fogging system
  - Year production of 10kg/m^2
- Energy
  - Max. 5 m^3 gas per m2 per year:
    - Lowering peak usage
    - No minimum pipe temp.
    - Screening against outgoing radiation
    - Active dehumification

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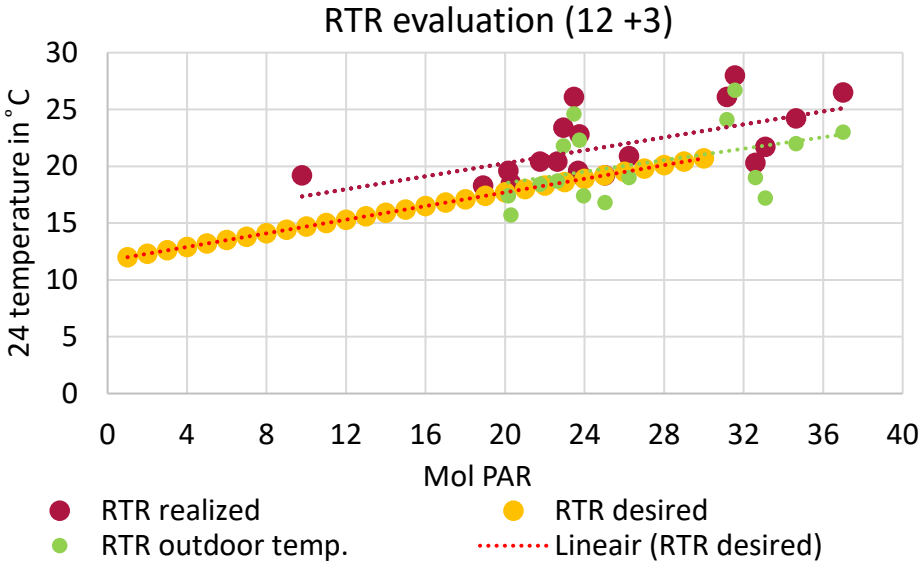
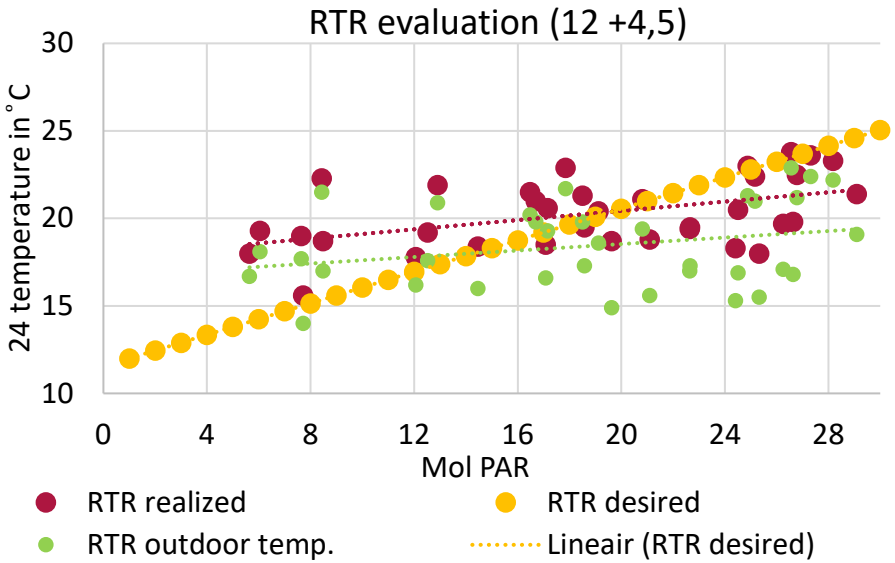
Ratio of temperature and radiation - RTR

- Allows to plan a cultivation based on GDH
- Should match with crop development
- Using ‘free’ energy to build up temperature
- Smaller DIF, higher humidity and isolation to retain heat at night

	Bud break			Lateral outgrowth			Flower bud development			Production				
Week	27	28	29	30	31	32	33	34	35	36	-	42	-	48
RTR	12+3			12+4,5			12+3			RTR 14+3				
GDH week	2.645	2.582	2.582	3.210	3.199	3.115	2.428	2.315	2.219	2.476		2.070		1.767

RTR evaluation





- Balancing plant development and sugar production
- In summertime, realising RTR can be limited due to high outside (night) temperatures
- Retaining ‘free’ energy from daytime to limit heating at night

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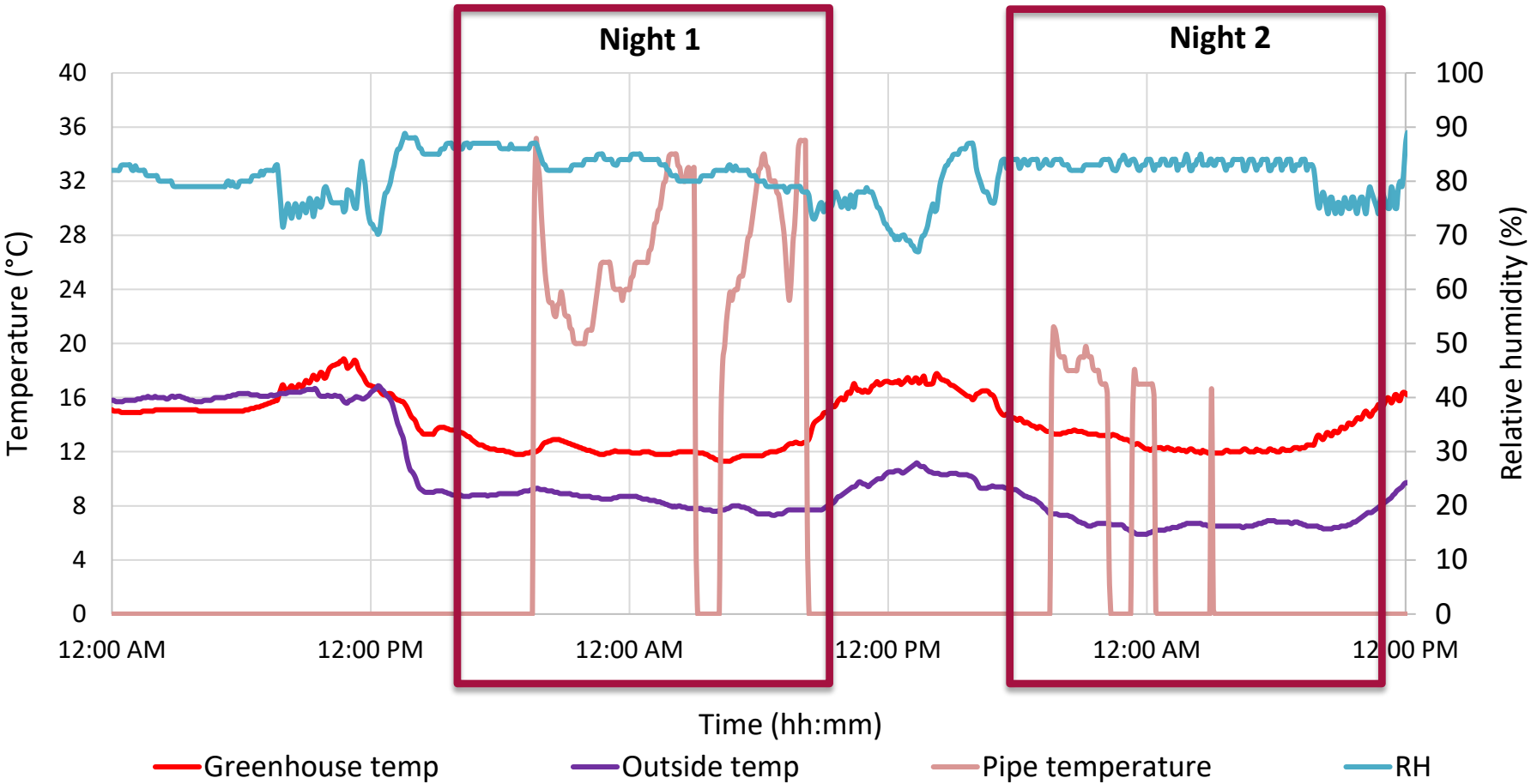
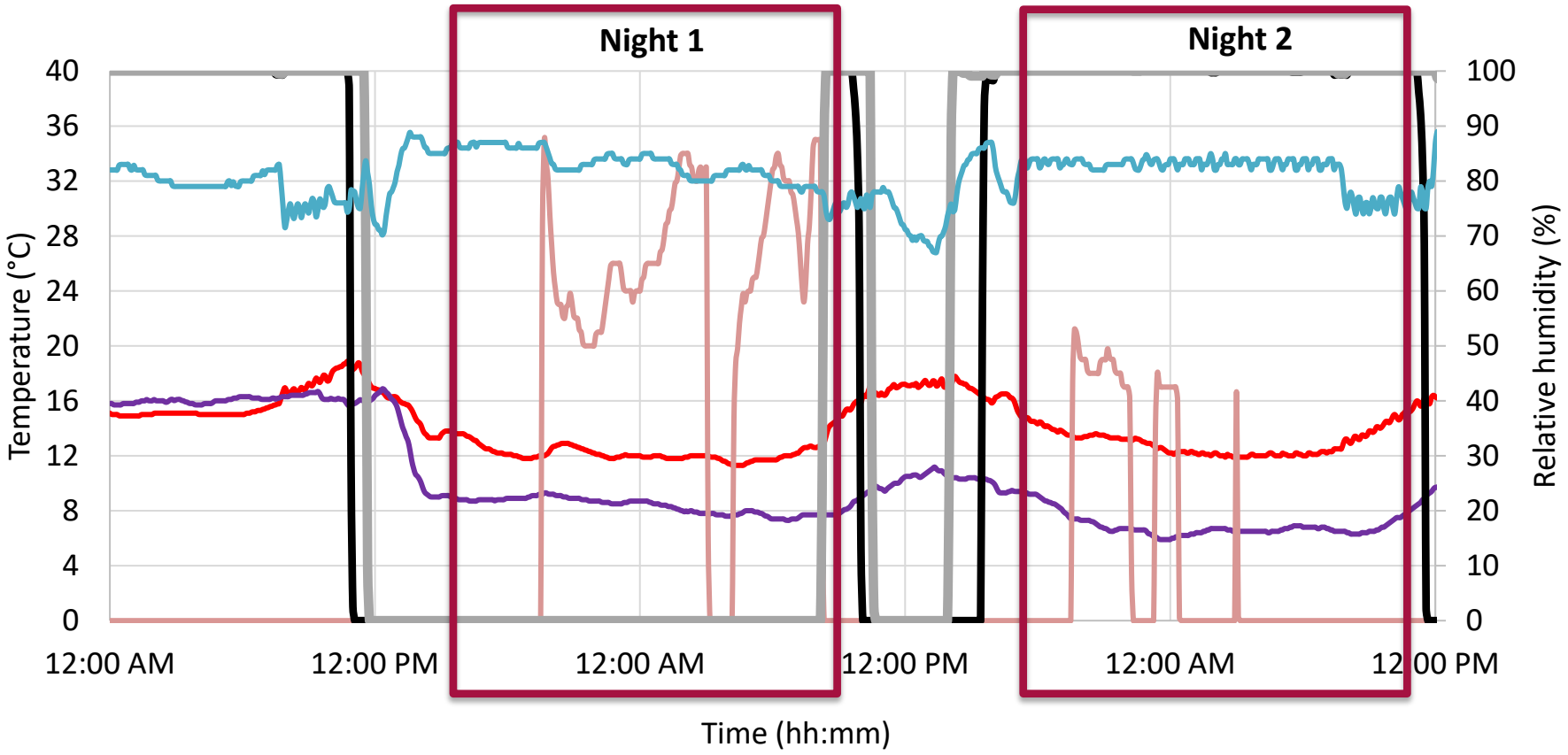
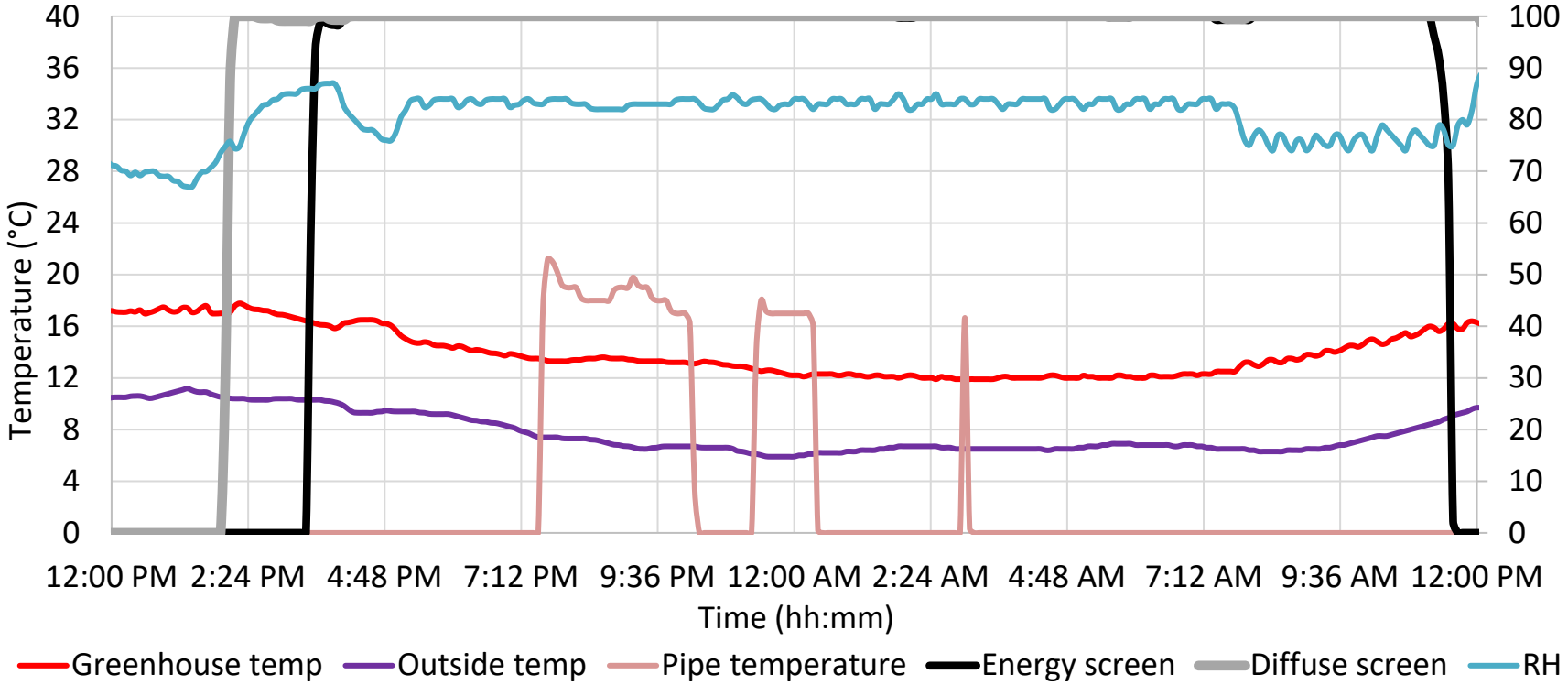
Two screens - isolation



Two screens – isolation



Night 2: Isolation + dehumidification



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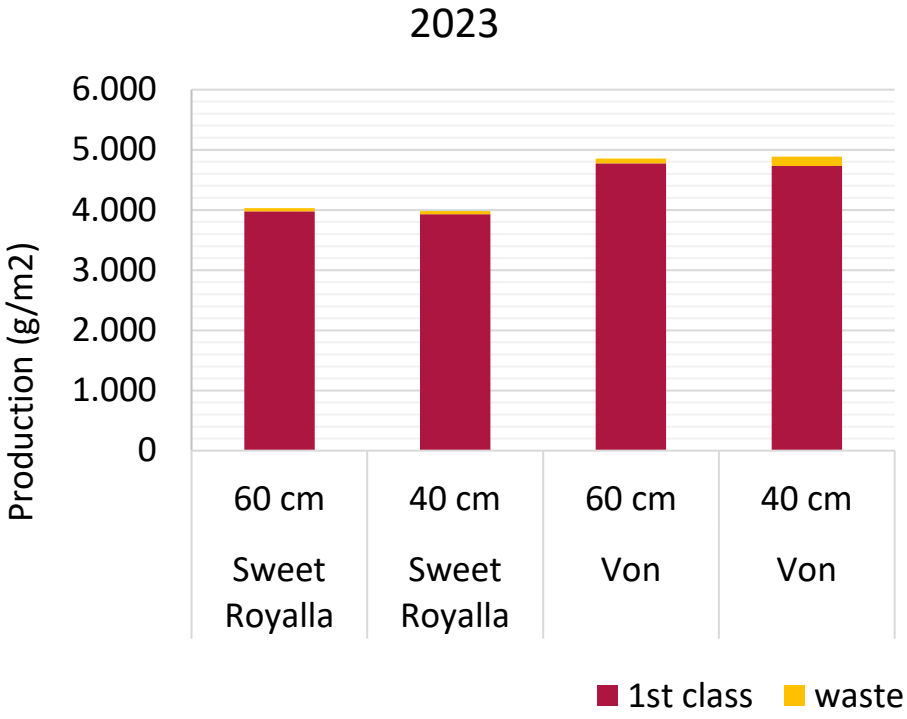
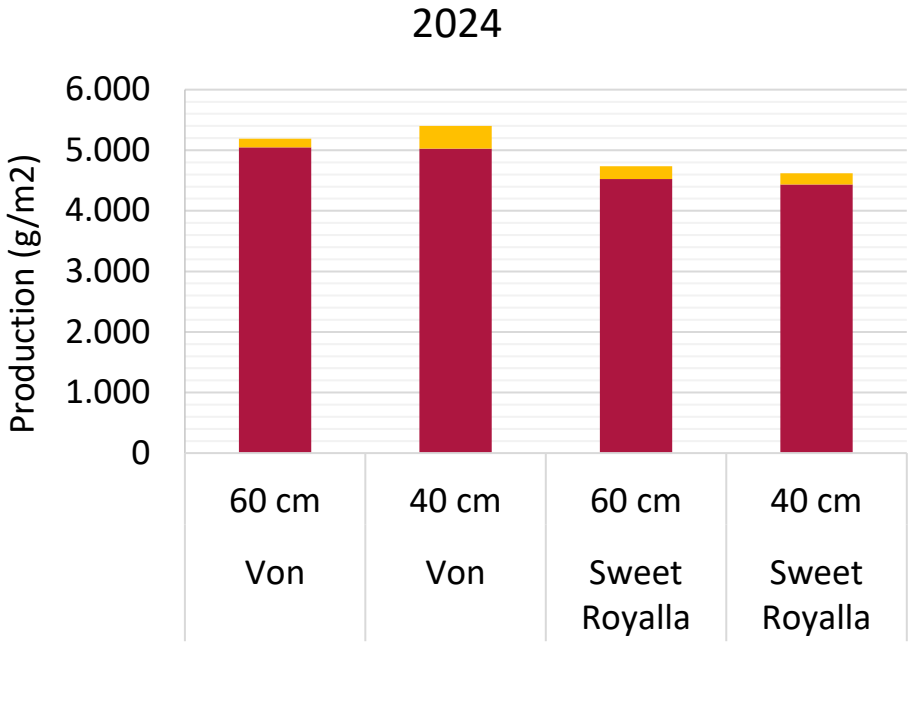
Autumn results 2023 & 2024

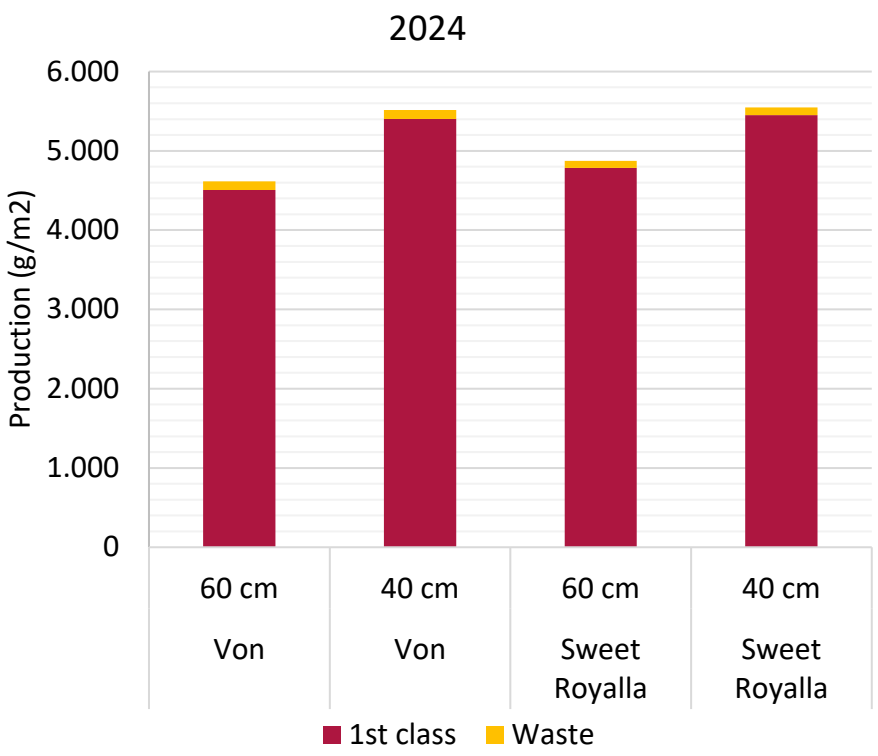


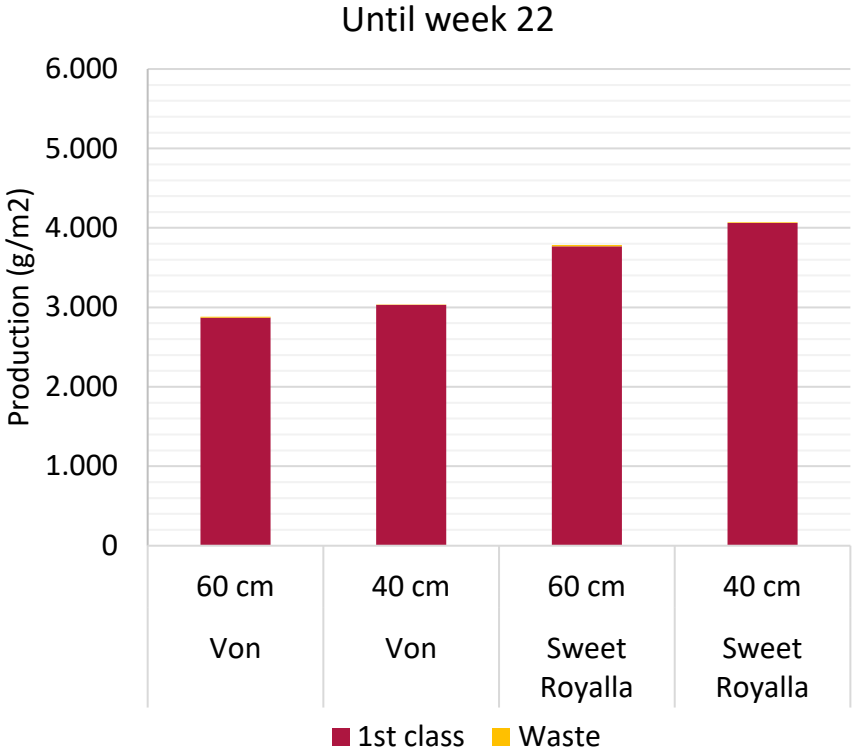


2023: 1,3 gas m^3/m^3

2024: 1,3 gas m^3/m^3

Spring production 2024-2025



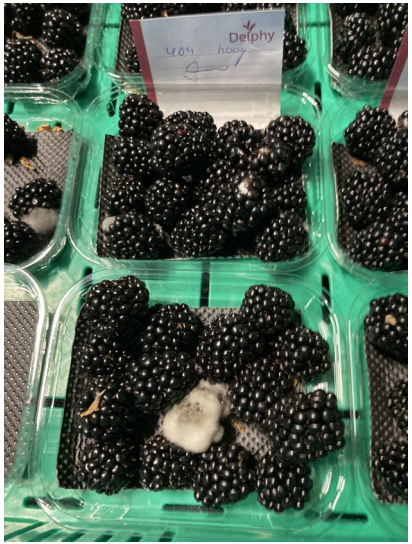


2024: 3,5 gas m^3/m^3

2025: 3,2 gas m^3/m^3

Fine-tuning: optimizing yield and quality

- Production potential has definitely been shown!
- In first years trial, we've seen a decrease of quality in autumn
  - Weak fruits and fungal development in storage
  - Allowed (too) high humidity → risk of condensation
- Second year autumn
  - Better quality, better storage
  - Only near end of autumn cultivation, weaker fruits and quicker softening during storage
- Still too high humidity with dehumidification? Or different reason?



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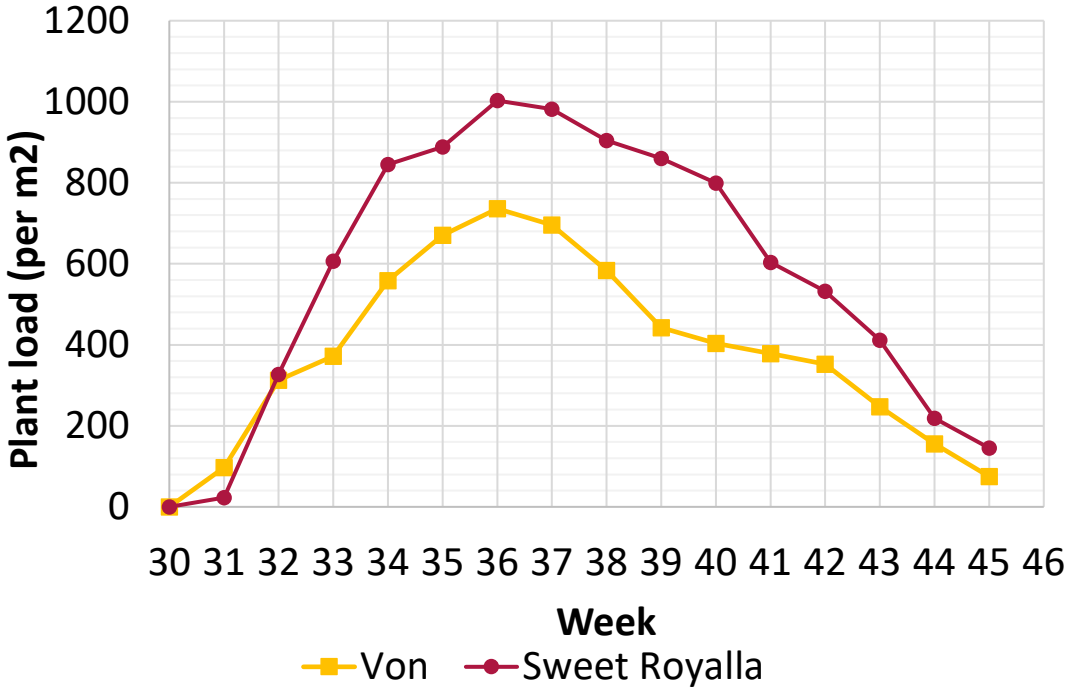
Blackberry has a huge assimilate demand

- High plant load per m^2
- Fruits continuously ripen from week 36 onwards
- Due to high competition, the total sugar demand is high
- In addition, light levels are decreasing…



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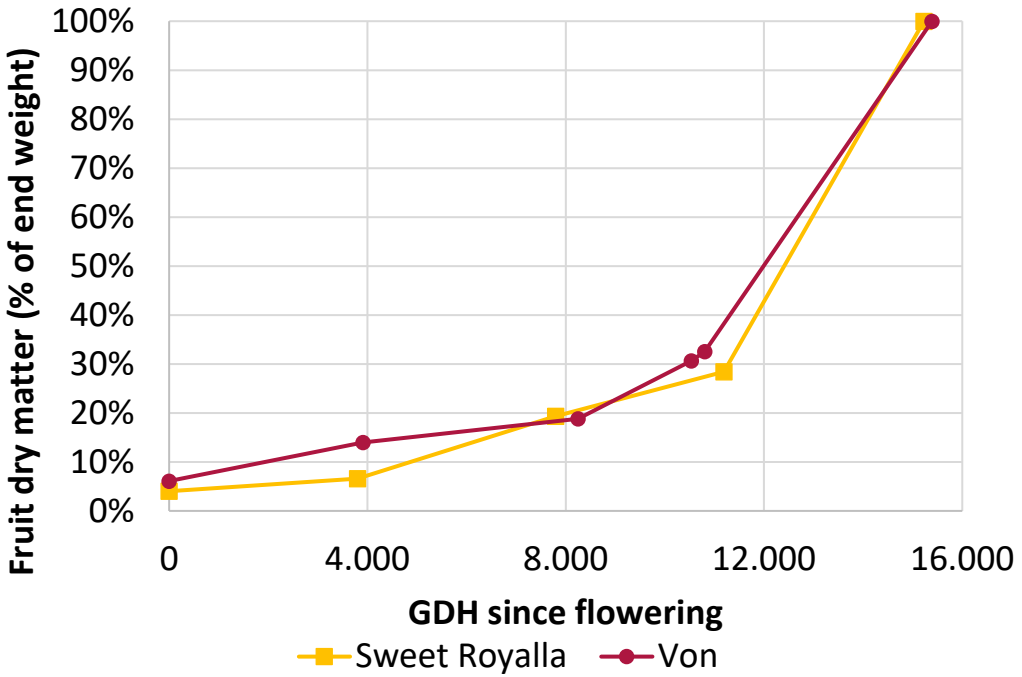
Fruit dry matter development

- Dry matter development of first top fruits
  - Fruits with limited competition
  - "ideal" ripening situation
- High dry matter increase during last ripening phase
  - Demand for sugar increases
- Limited sugars available for latest fruit:
  - Competition
  - Low light levels
  - Crop respiration / maintenance

→ Weaker fruits in late autumn



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Summary of trial results

- Production >10 kg/m^2 ✓
  - Autumn: lower plant density
  - Spring: production increase at high density
- Energy: Gas usage <5 m^3/m^2 ✓
  - RTR good method to plan cultivation of blackberry
  - Two screens improve isolation
  - Dehumidification decrease energy losses + more control
- Opportunity's?
  - Based on assimilate balance:
    - Further optimize RTR strategy
    - Matching peak sugar demand

  →Optimizing yield and fruit quality!

An energy efficient blackberry cultivation is definitely possible!

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Thank you for your attention!

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