

Kwaliteitsverbetering van
witloof doorheen de hele
productieketen:

ChiQon



VLAIO LA-traject HBC.2018.2212

AGENTSCHAP
INNOVEREN &
ONDERNEMEN



Vlaanderen
is ondernemen



PRAKTIJKPUNT LANDBOUW
VLAAMS-BRABANT

KU LEUVEN



inagro
ONDERZOEK & ADVIES IN LAND- & TUINBOUW





Energiebesparing mogelijk in witloofbewaring door lager debiet van ventilatoren?

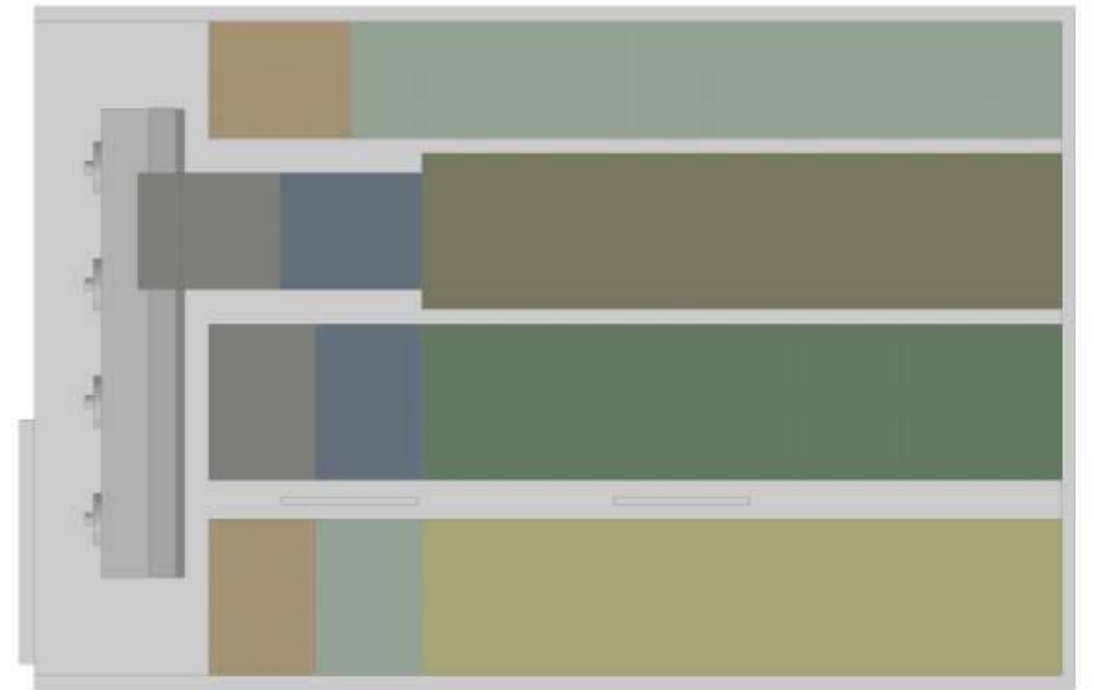
Pieter Verboven en Bart Nicolai

KU Leuven MeBioS Naoogsttechnologie

Rassenavond, Praktijkpunt, 8/3/2023

Witloofwortelcel

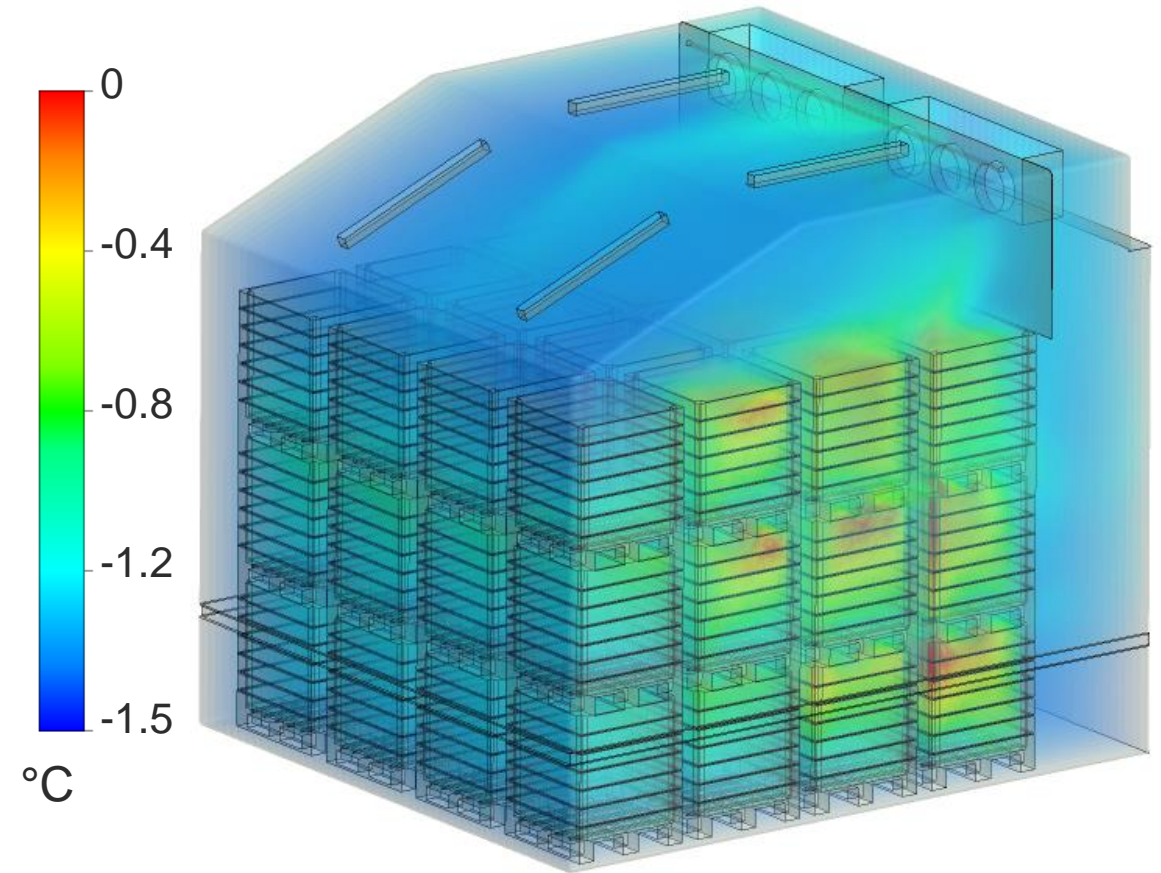
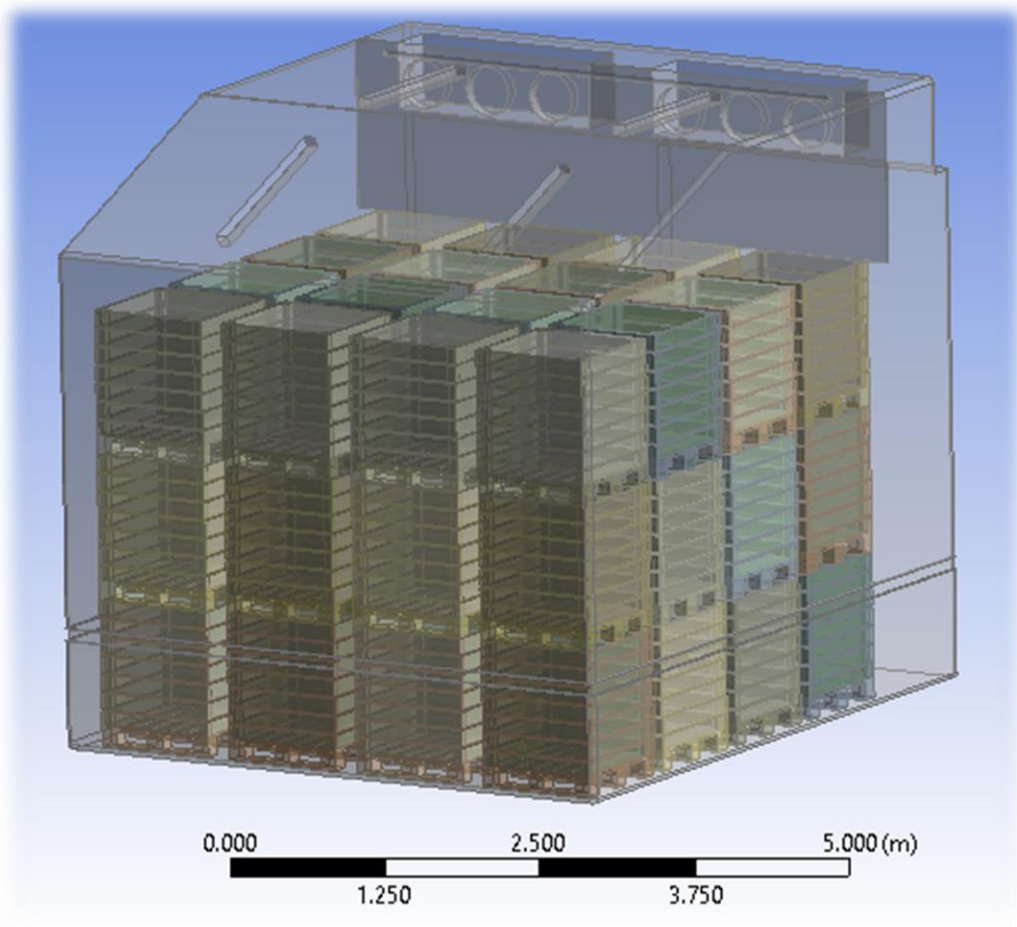
- NH3 koeling: 24 kW
- 4 ventilatoren: 28000 m³/h continue draaitijd, ~1 kW/fan



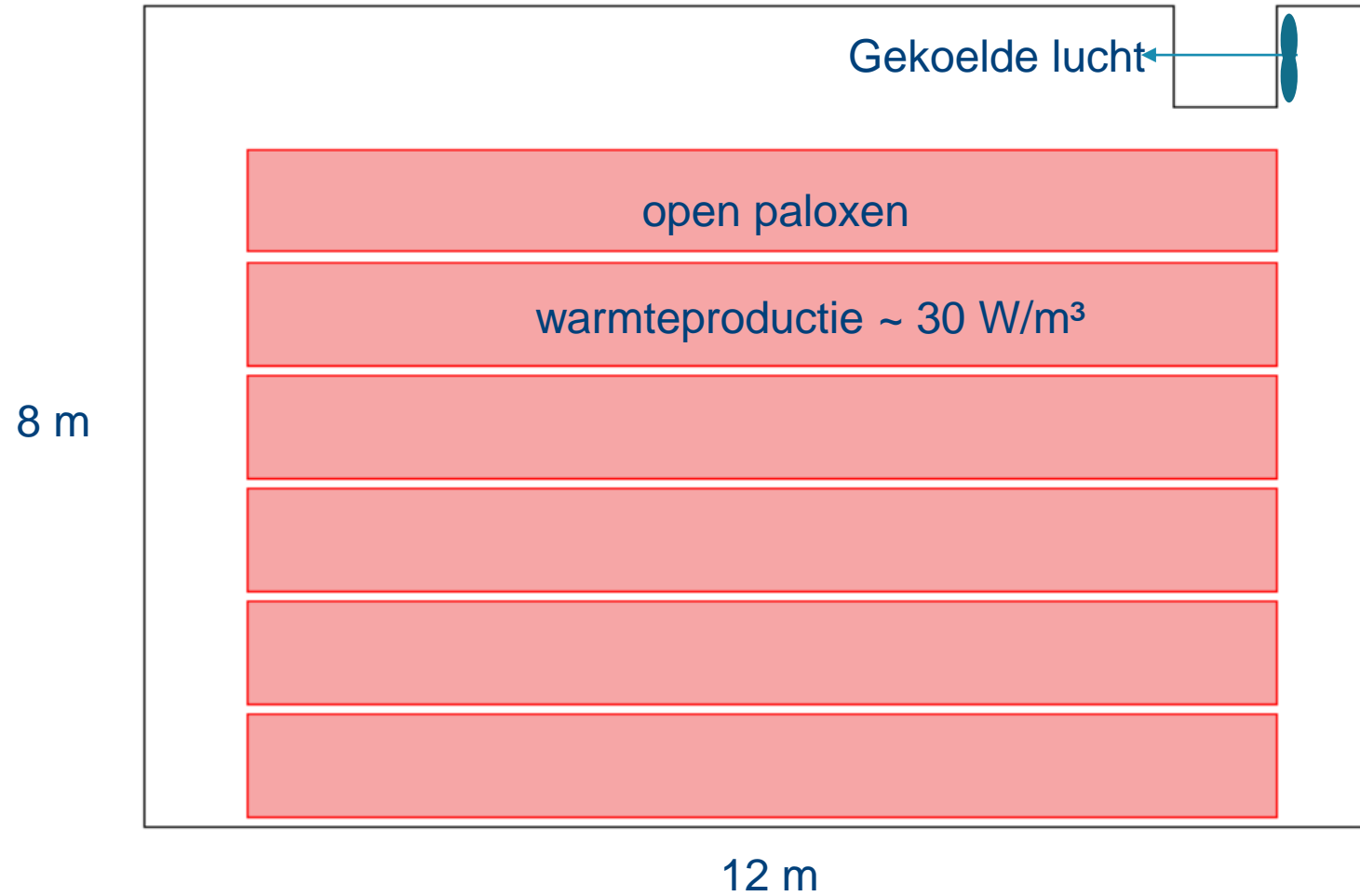
Witloofwortelcel: metingen



CFD simulatie van koelcellen

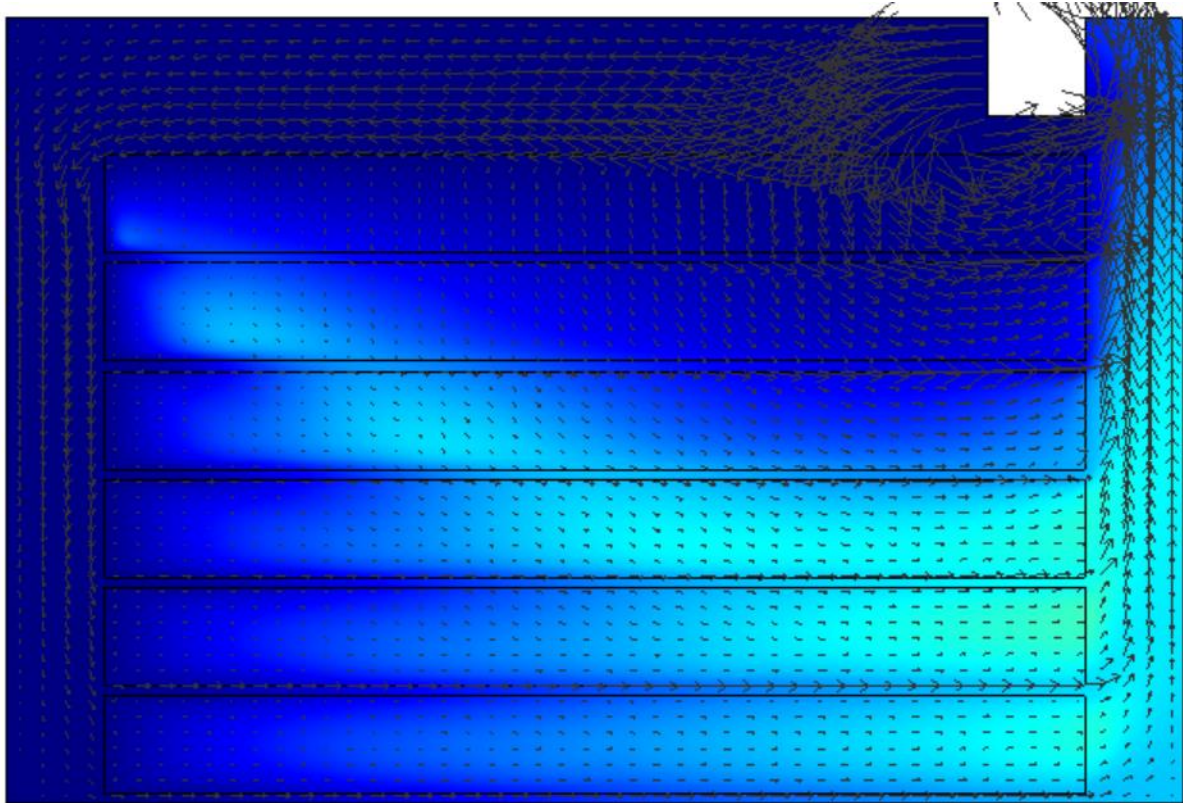


Witloofwortelcel, 180 ton



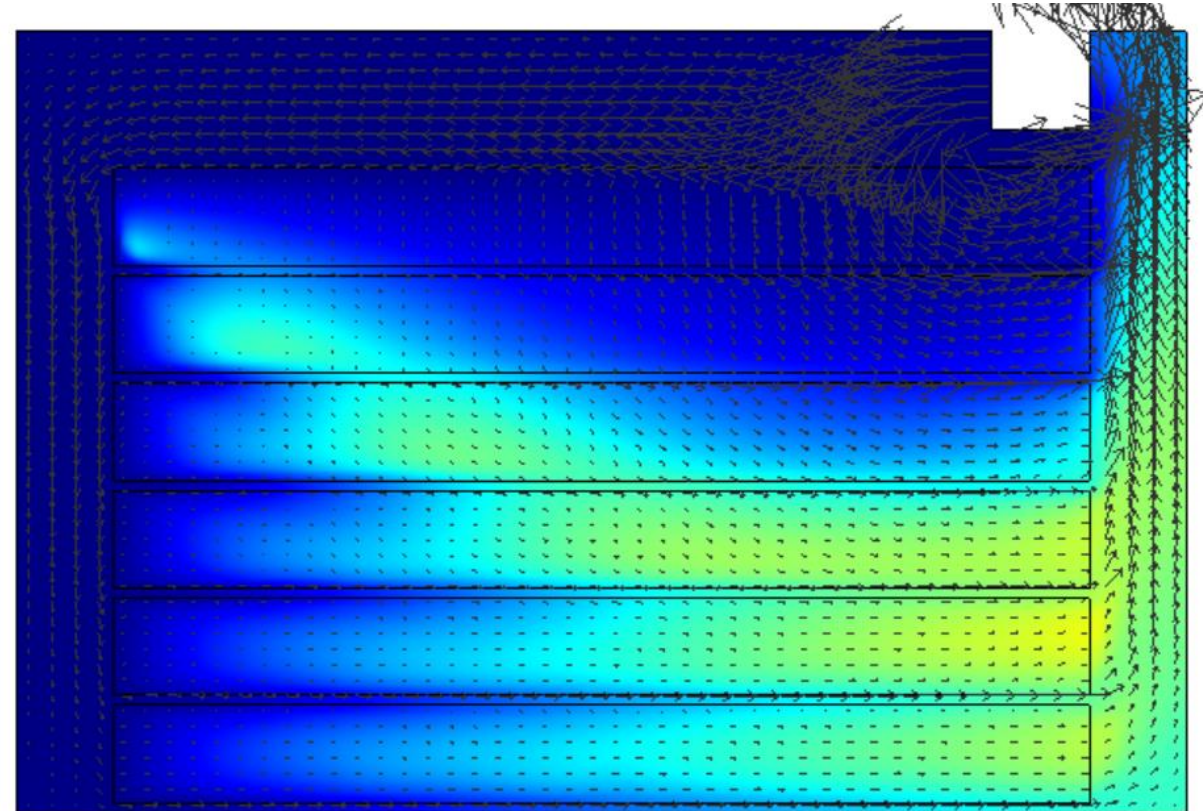
Open bins

- Fan 100%



Average root T = -1.3°C

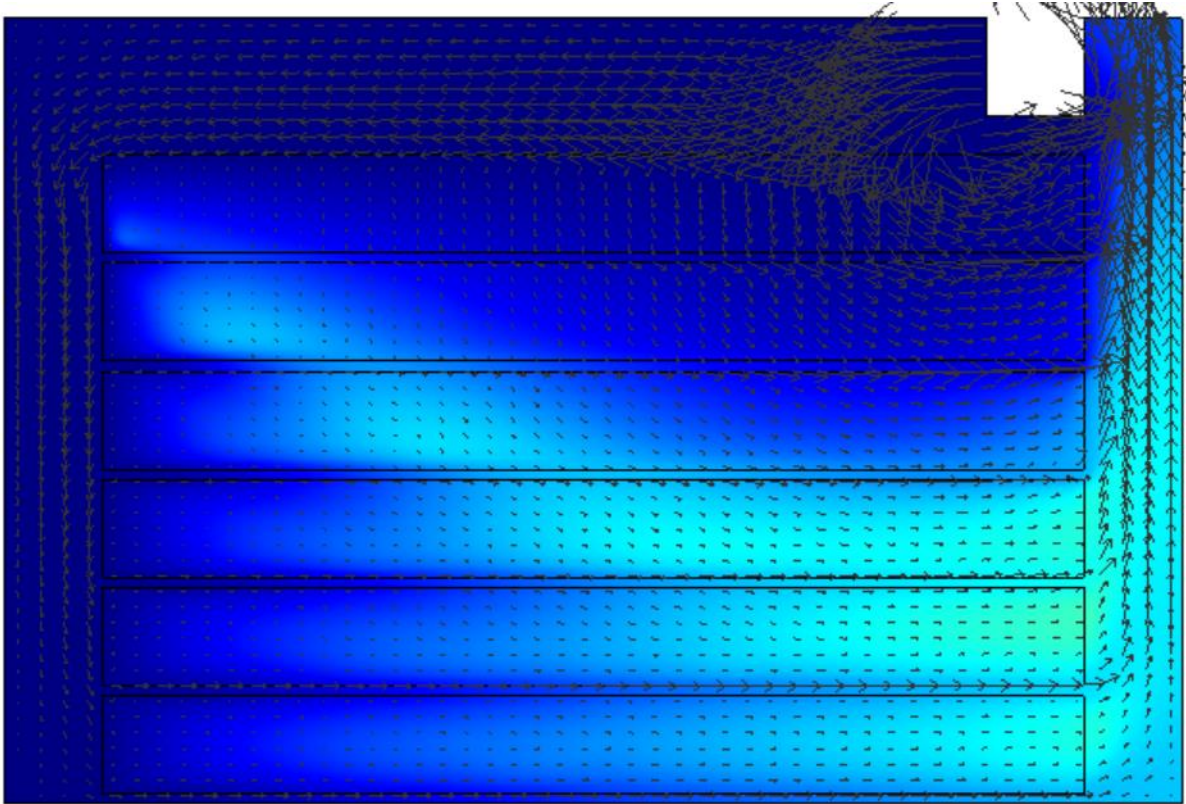
- Fan 75%



Average root T = -1.0°C

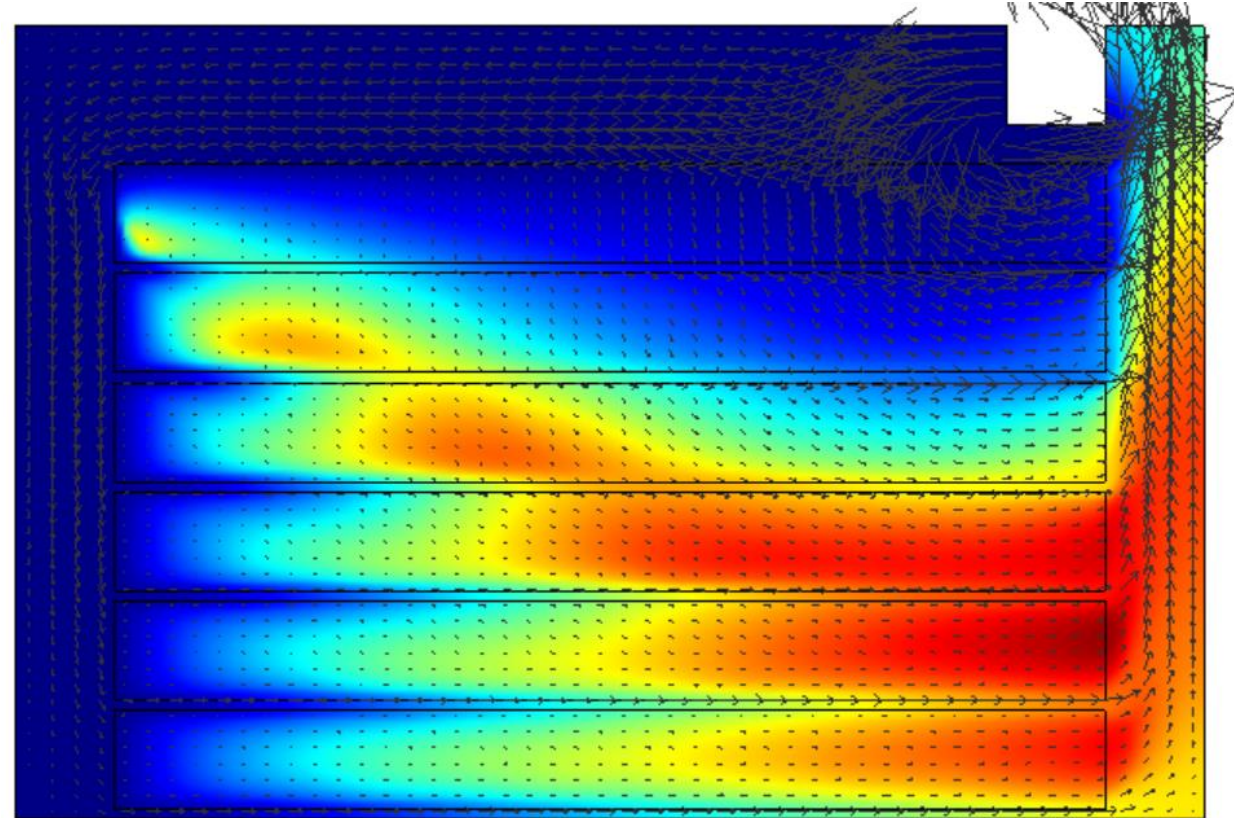
Open bins

- Fan 100%

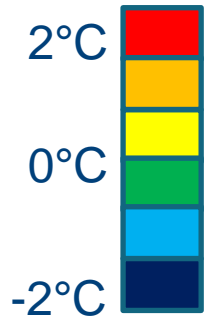


Average root $T = -1.3^{\circ}\text{C}$

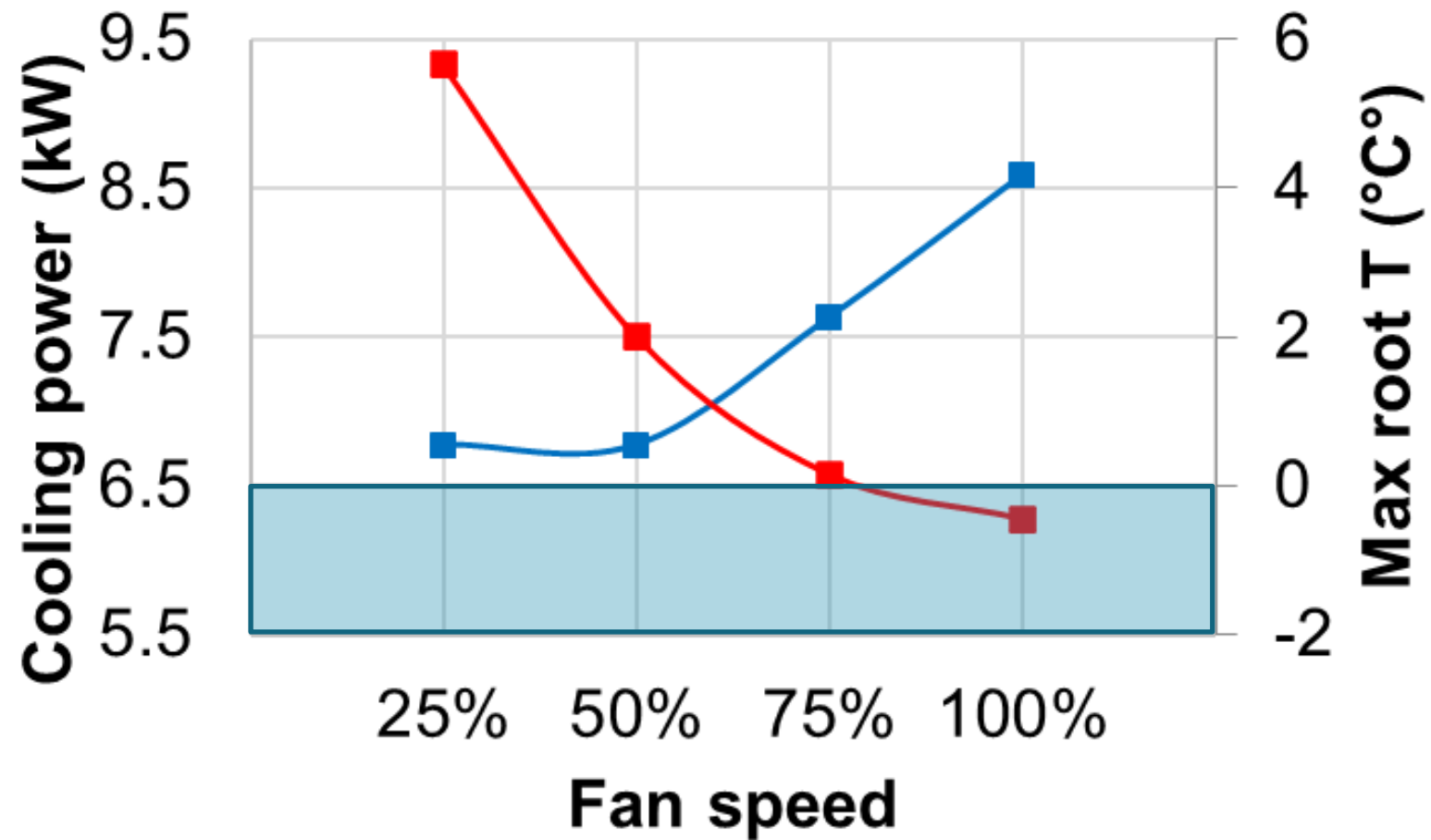
- Fan 50%



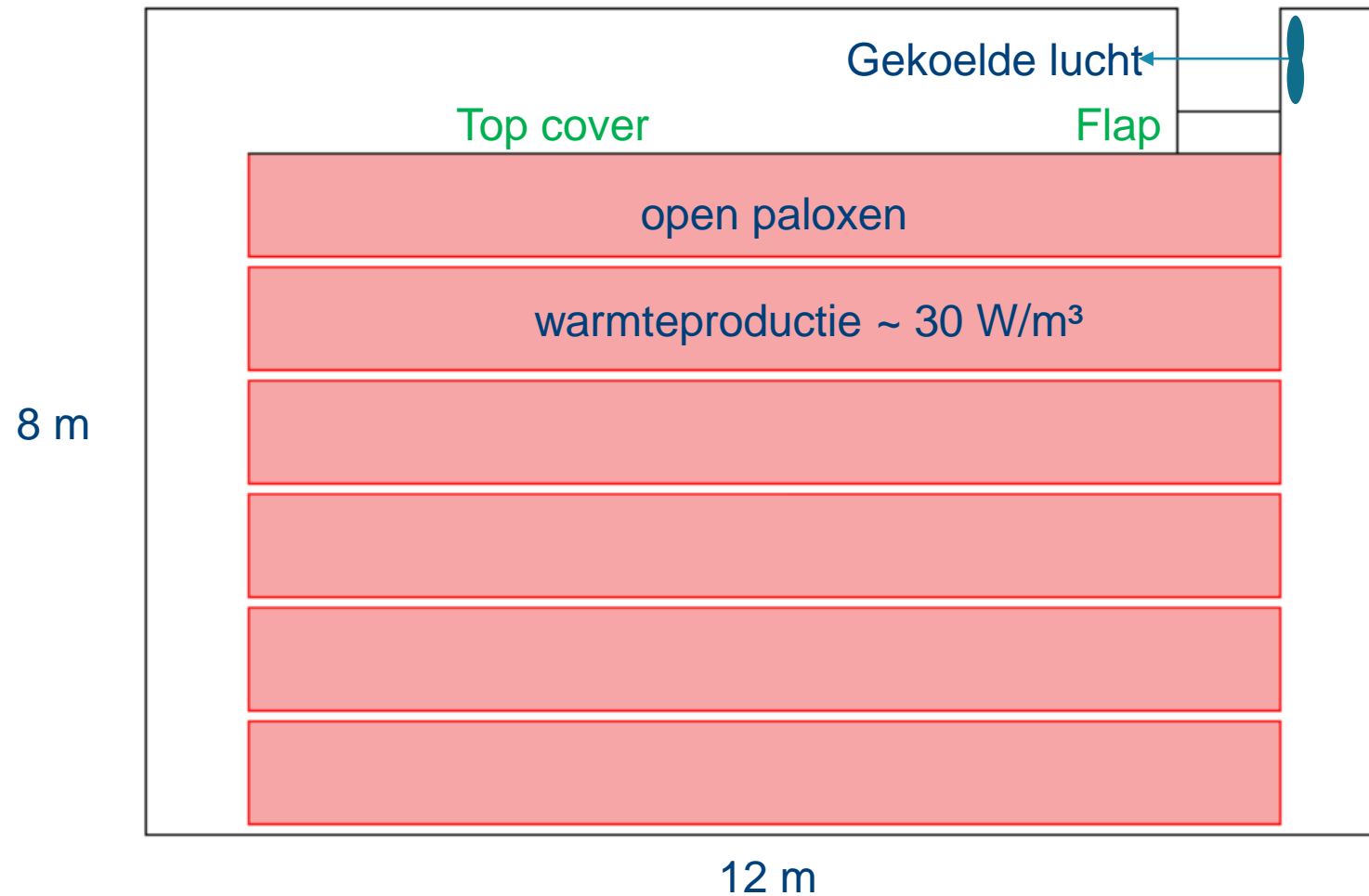
Average root $T = -0.3^{\circ}\text{C}$



Open bins, 180 tons

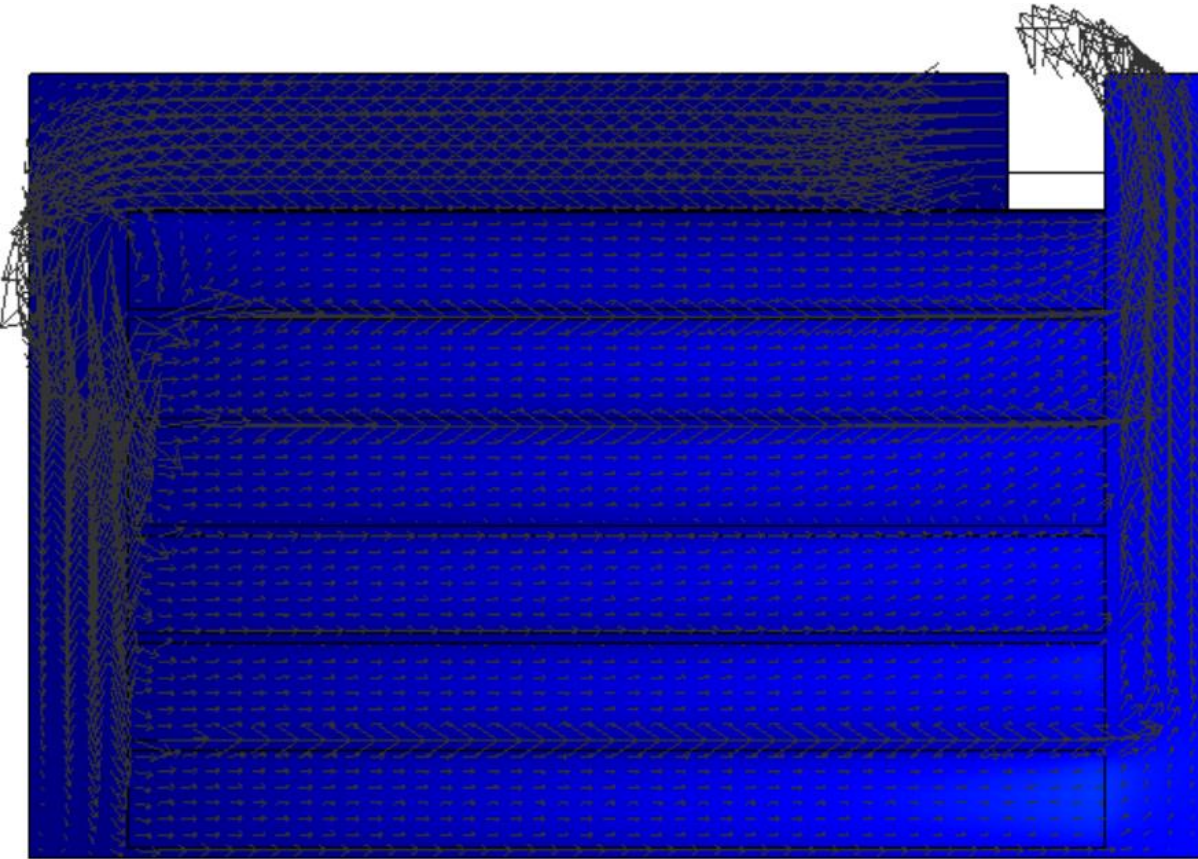


Witloofwortelcel, 180 ton



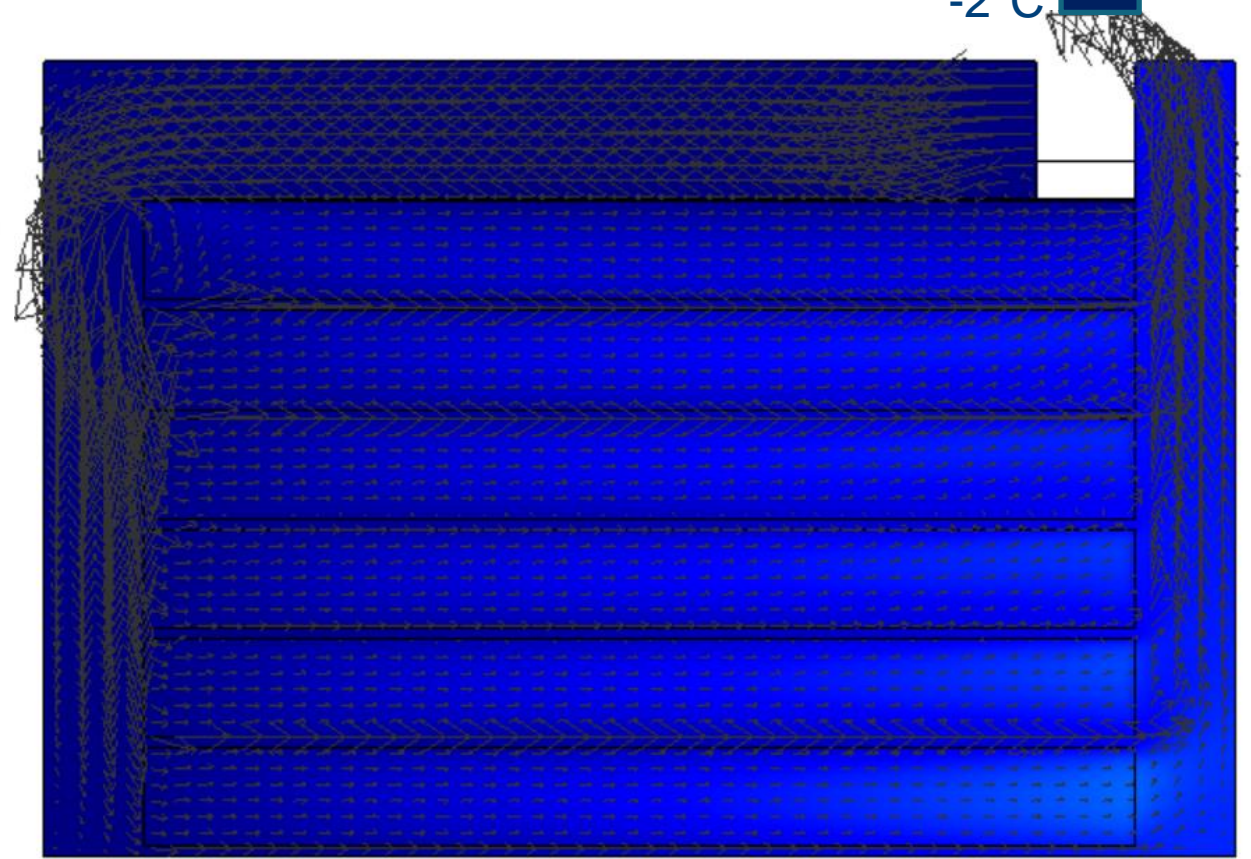
Top cover bins

- Fan 100%

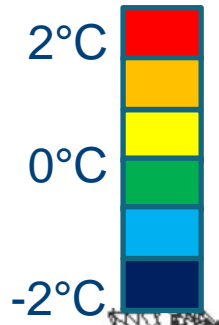


Average root T = -1.8°C

- Fan 75%

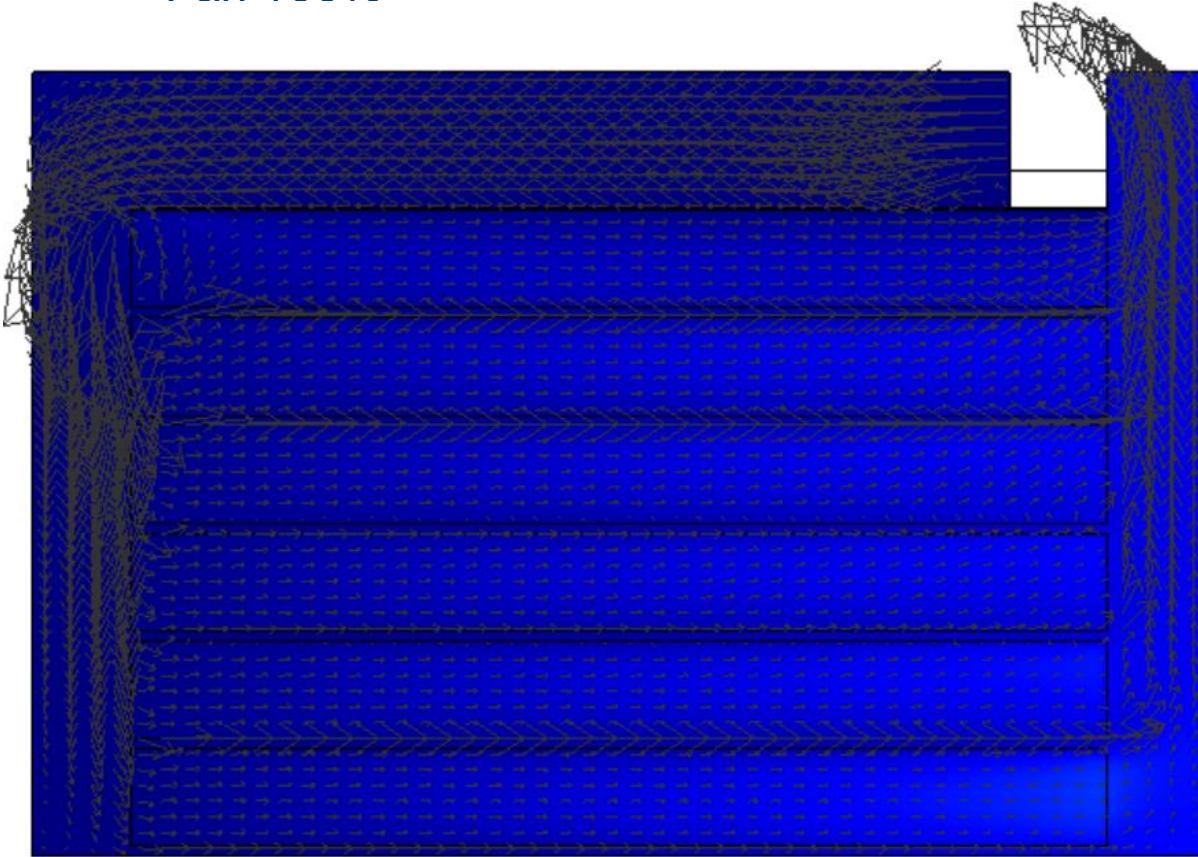


Average root T = -1.7°C



Top cover bins

- Fan 100%

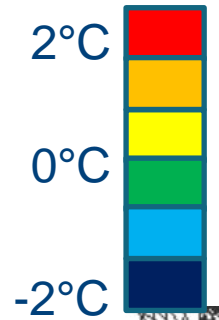


Average root $T = -1.8^{\circ}\text{C}$

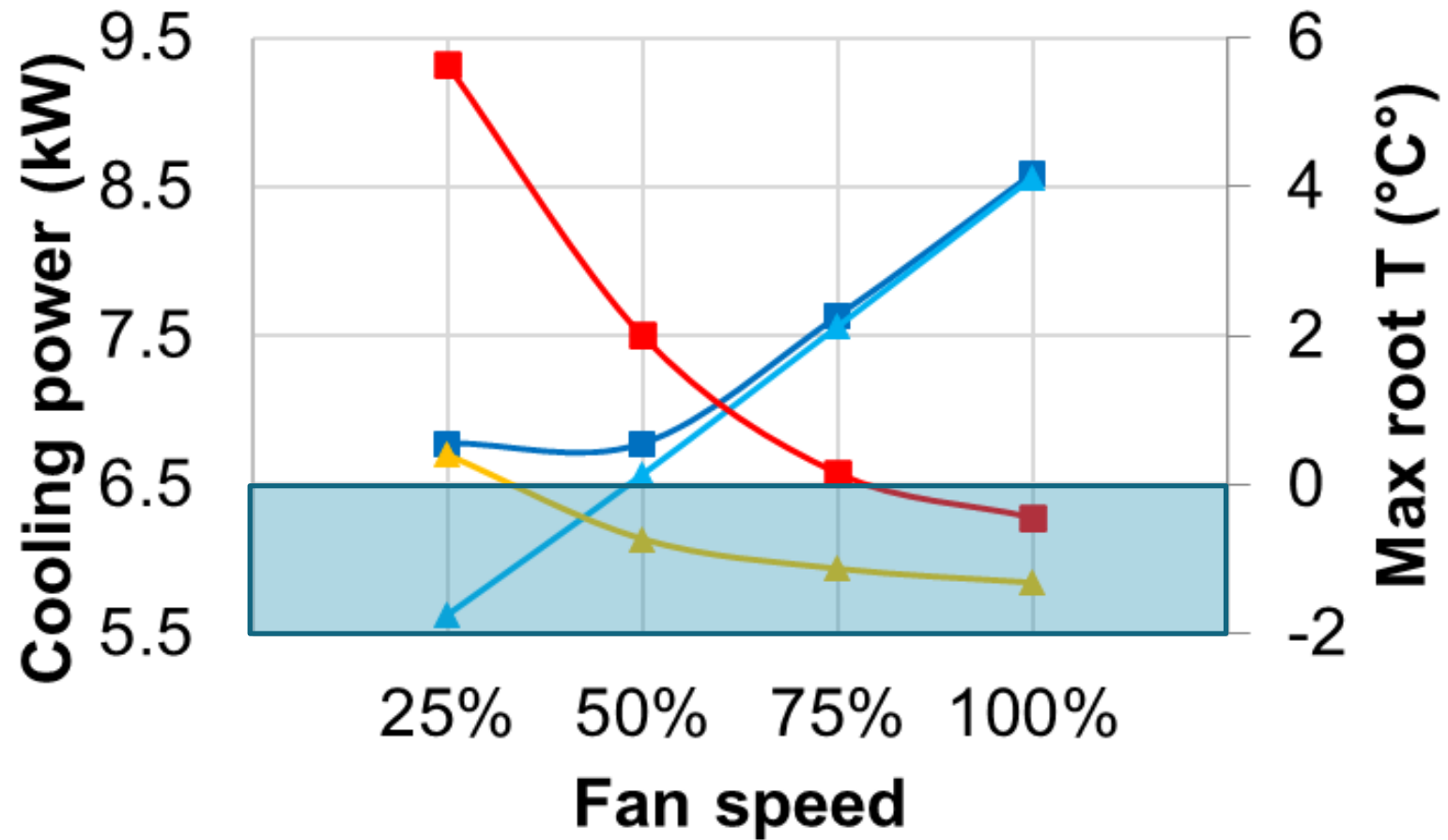
- Fan 50%



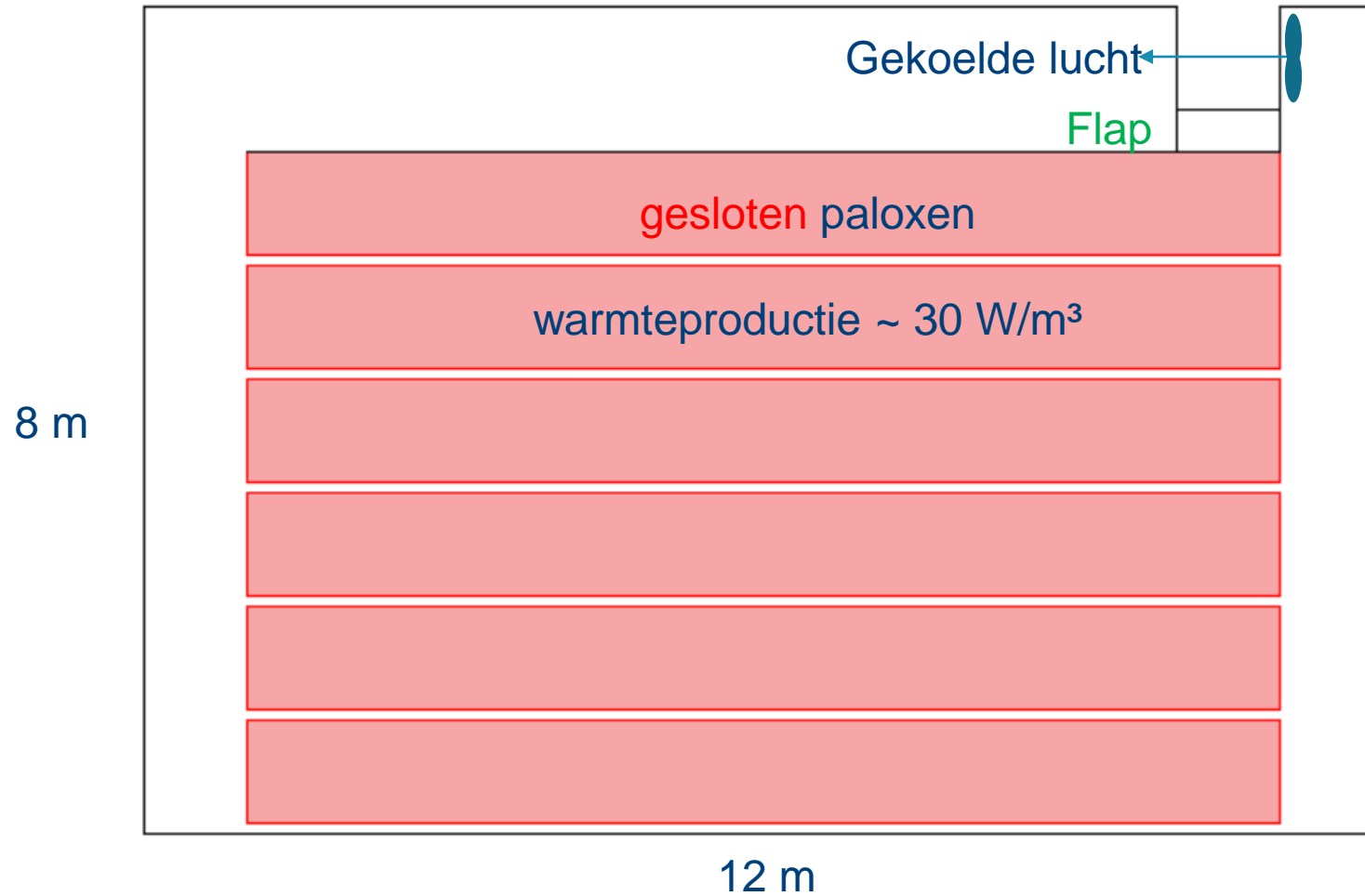
Average root $T = -1.5^{\circ}\text{C}$



Top cover bins, 180 tons

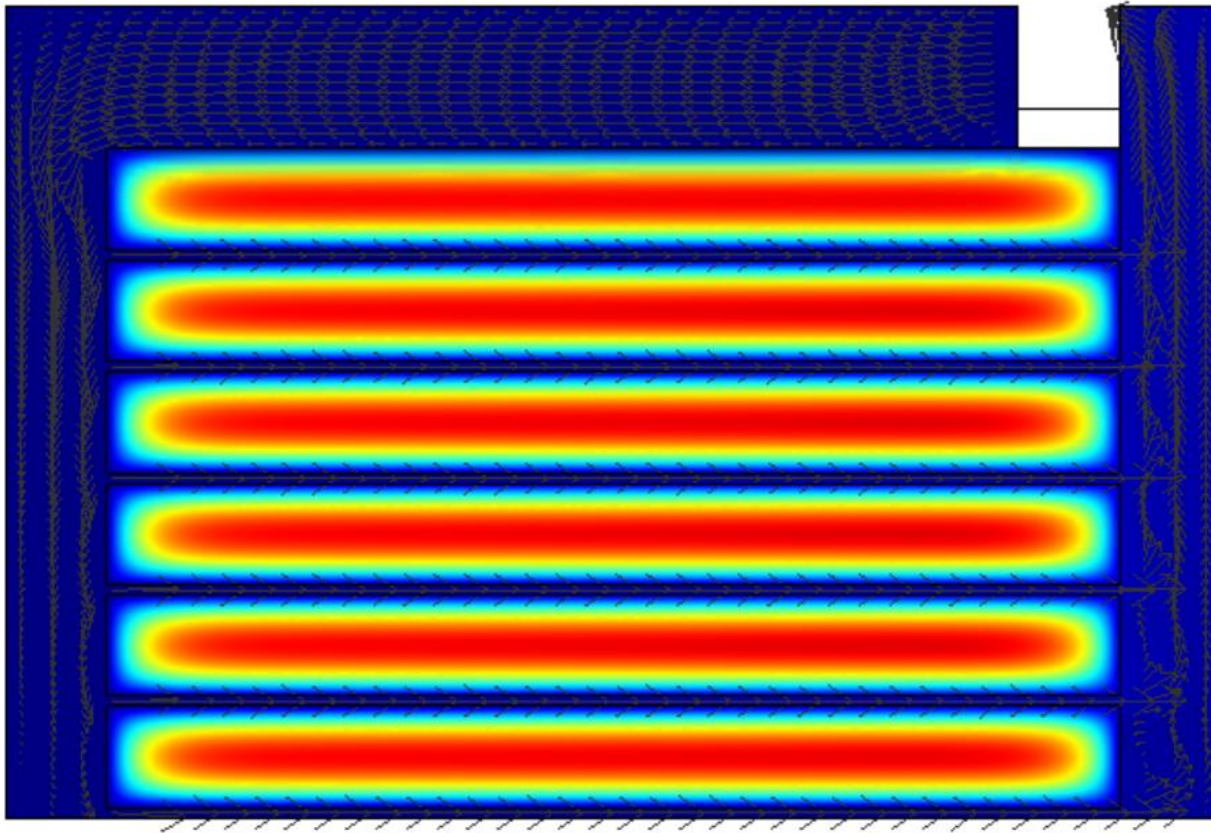


Witloofwortelcel, 180 ton



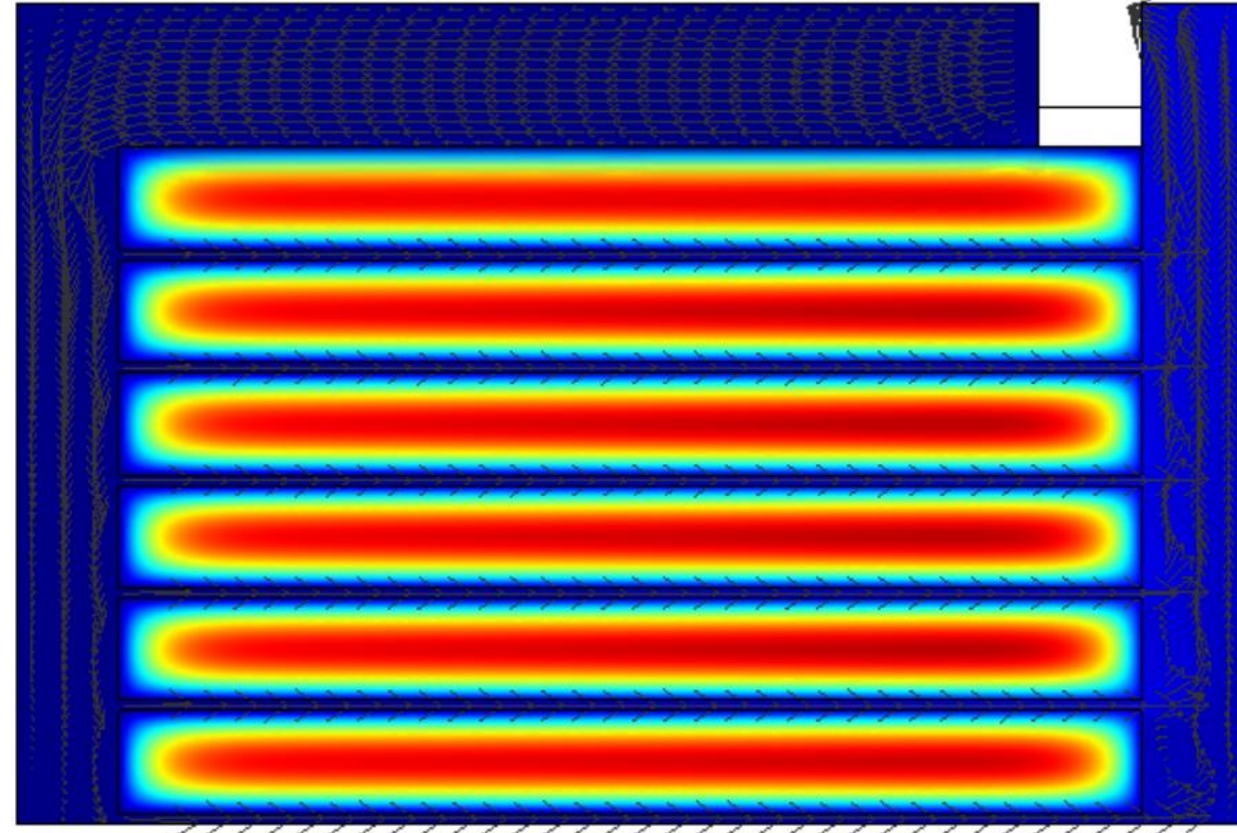
Gesloten bins

- Fan 100%

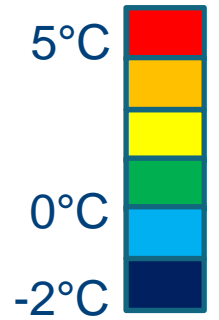


Average root T = 1.9°C

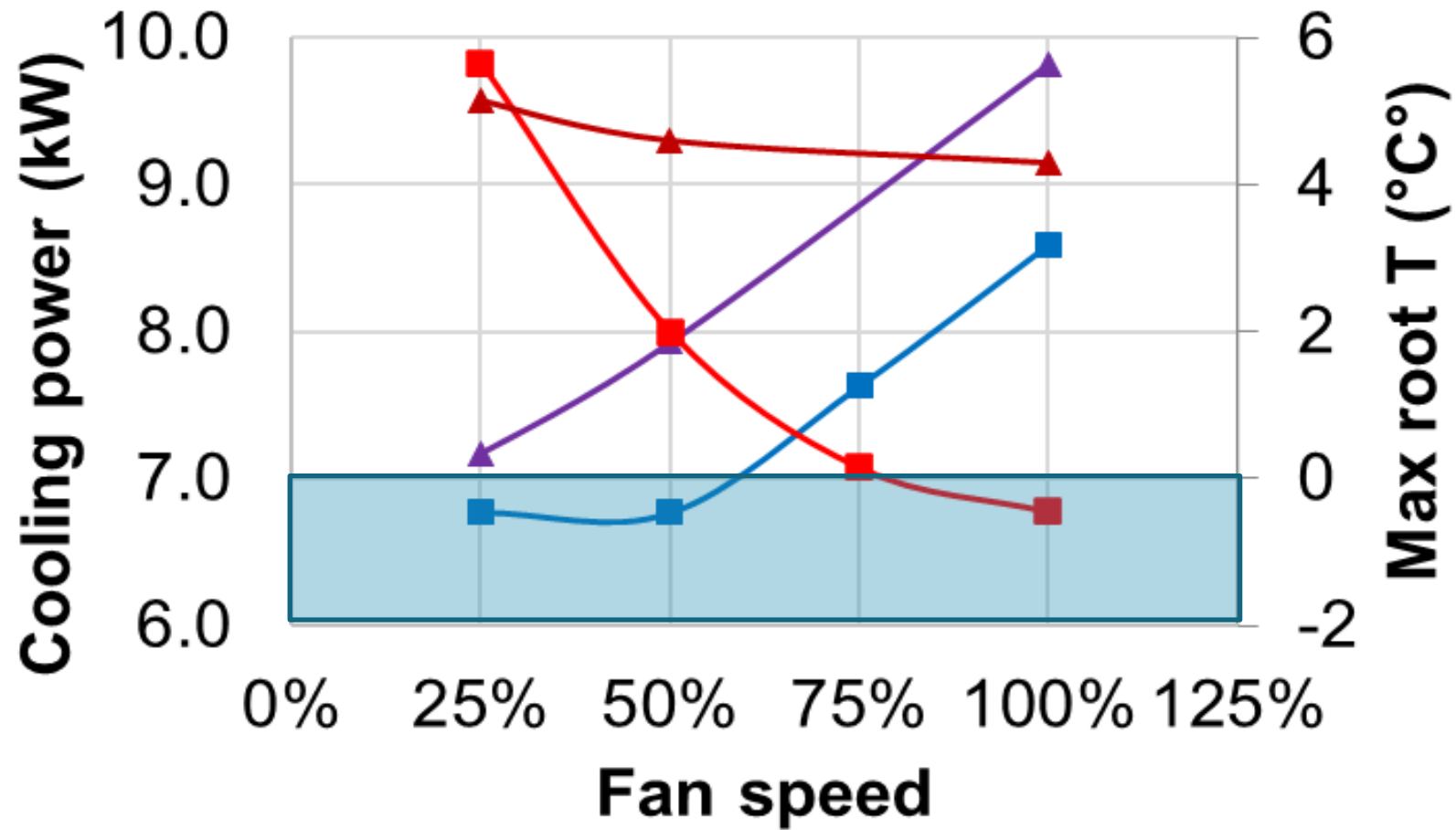
- Fan 50%



Average root T = 2.1°C



Gesloten bins, 180 tons



Besluit

- Open bins
 - Kortsluiting van de koude luchtstroom
 - Grote warme zone bij lage ventilatordebieten
 - Hoog debiet nodig om hot spots te vermijden
- Top cover en flap
 - Lucht beter geleid over en door de paloxen
 - Homogenere temperatuur
 - Ook bij lagere debieten (-50%) minder kans op hot spots
 - Energiebesparing tot -25%
- Gesloten bins
 - Lucht beweegt enkel rond de paloxen
 - Gemiddelde temperatuur in paloxen veel hoger
 - Weinig effect van ventilatordebiet
 - Energieverbruik stijgt tot +15%



Cooling/fan power

