



**5TH INTERNATIONAL
STRAWBERRY CONGRESS**

Thursday

Parallel Session 3: Innovative Technology & Vertical Farming

Drone-based yield prediction for everbearing strawberries

18-09-2025

Yasmin Vanbrabant



5th International Strawberry Congress



Medegefinancierd door
de Europese Unie

AGENTSCHAP
LANDBOUW &
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NETWERK



**Drone
imagery
collection**



**Image
processing**



**AI Flower
detection**



**Correction
factor**



**Yield
estimation
model**



Drone
imagery
collection

DJI Mini 4 Pro drone collection in open field and scaffold systems





Drone imagery collection

Open field parcel

- Verity
- 30 plants / plot
- 6 plants/ m
- Yield prediction per 5 m



Scaffold parcel

- Karima
- 21 plants/plot
- 8.4 planten/m
- Yield prediction per 2.5 m





AI Flower detection



Model accuracy = 0.87



**Correction
factor**

Manual counted flowers AI counted flowers

Sources of differences in flower count:

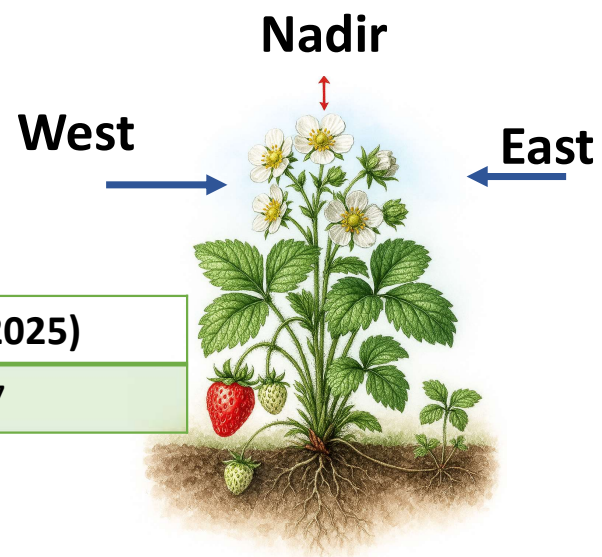
- Hidden flowers (FOV)
- Discontinuity of images (missing flowers)
- Image duplicates (double counts)
- False positives/negatives by AI detection



Correction factor

Open field parcel

FOV	Verity (2024)	Verity (2025)
Nadir	0.66	0.57



Scaffold parcel

FOV	Karima – July (2024)	Karima – July (2025)	Karima – August (2025)
East	0.5	0.45	0.72
West	0.8	0.47	0.69
East + West	1.3	0.93	1.41



Yield estimation model

	GAM 1 – number of fruits		GAM 2 – Kg fruits	
	R2	Mean error	R2	Mean error
Karima	0.81	22%	0.49	38%
Lady Emma	0.52	26%	0.59	21%
Verity	/	/	0.86	13%



Yield estimation model

Verity
2025

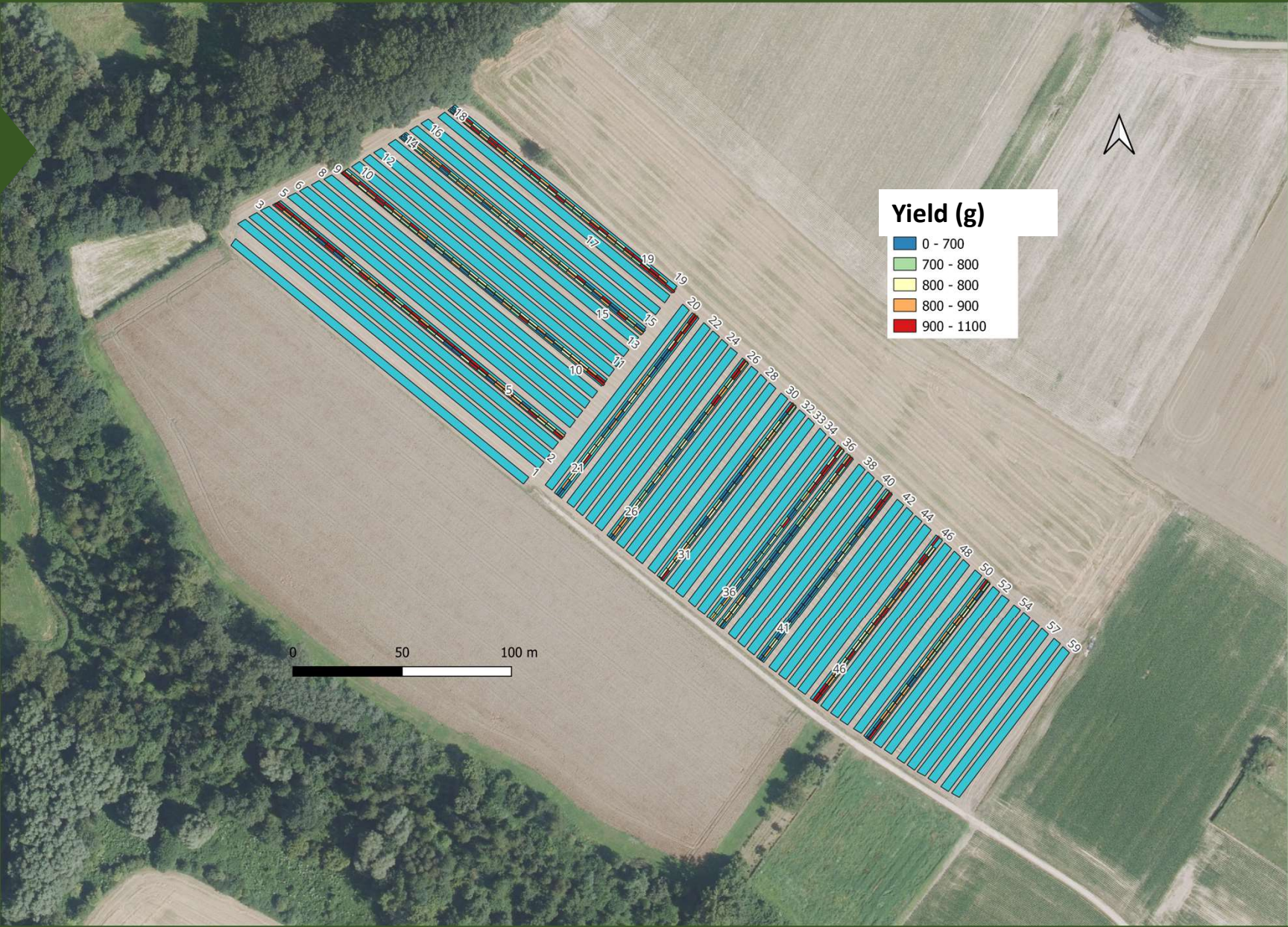
Sample= 10%





Yield estimation model

Verity
2025





Yield estimation model

Karima
2025

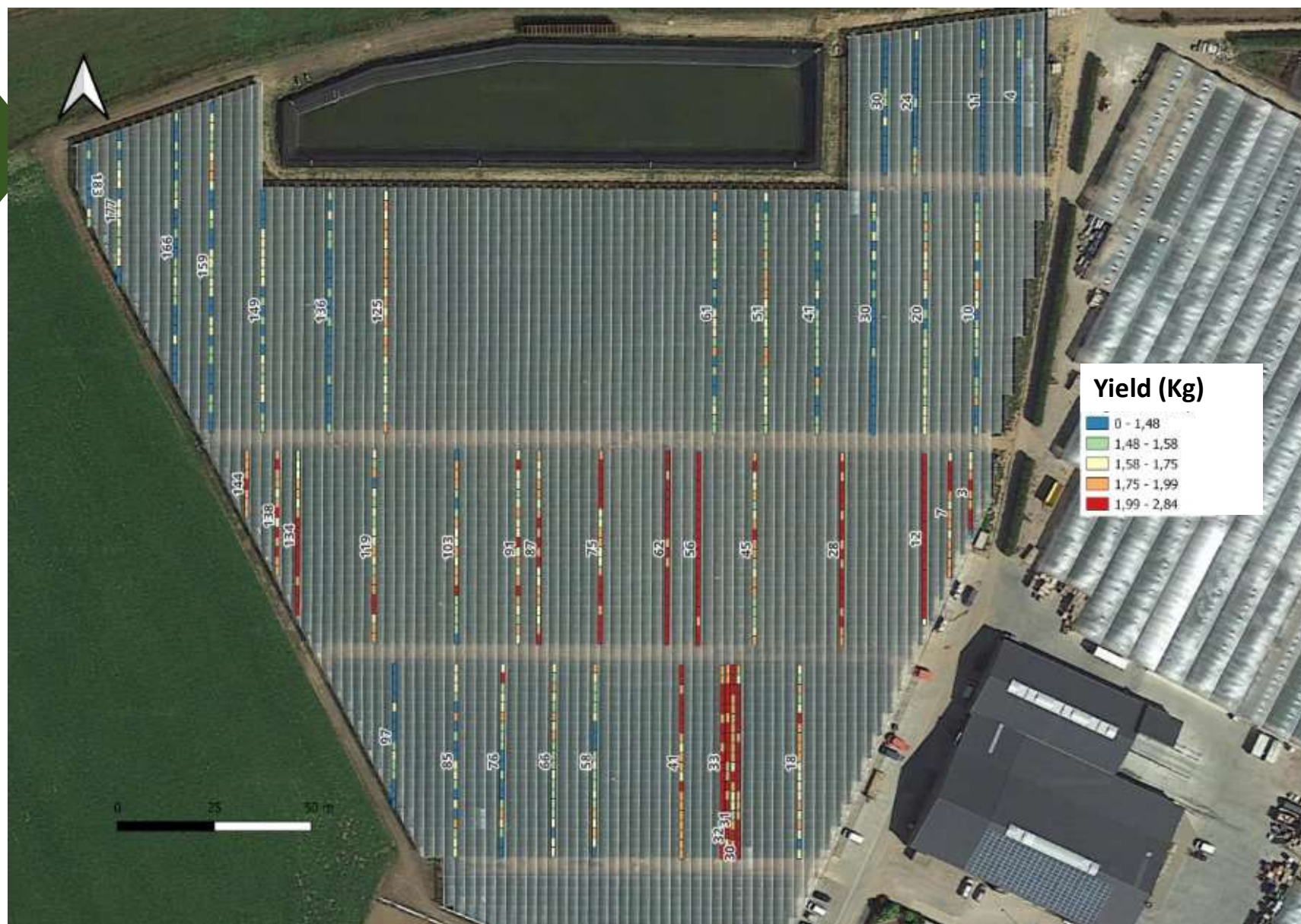
Sample= 10%





Yield estimation model

Karima
2025





Yield estimation model

2024+2025

GAM YIELD PREDICTIONS FOR THE CULTIVAR **VERITY** IN PERCENTAGES OF THE ACTUAL YIELD

	GAM 2- kg fruits	
	Percentage of actual yield	
Data	No correction factor	Correction factor
Nadir (2024)	91	104
Nadir (2025)	107	121



Yield estimation model

2024

GAM YIELD PREDICTIONS FOR THE CULTIVAR **KARIMA** IN PERCENTAGES OF THE ACTUAL YIELD

	GAM 1– number of fruits Percentage of actual yield		GAM 2- kg fruits Percentage of actual yield	
Data	No correction factor	Correction factor	No correction factor	Correction factor
East + West	127	116	98	89
East	106	132	80	101
West	101	106	77	81



**Yield
estimation
model**

2025

TABLE 1: GAM YIELD PREDICTIONS FOR THE CULTIVAR **KARIMA** IN PERCENTAGES OF THE ACTUAL YIELD

	GAM 1– number of fruits Percentage of actual yield		GAM 2- kg fruits Percentage of actual yield	
Data	No correction factor	Correction factor	No correction factor	Correction factor
East + West	134	115	115	118
East	96	133	91	114
West	110	144	96	123



Future prospects

- Data collection method
Drone vs tractor vs manual sampling
- Sampling size and methodology
- Accuracy beginning and end of growing season
- Training data



**5TH INTERNATIONAL
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Thursday

Networking Break

- Sponsors & Exhibitors Fair
- Poster Sessions

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