

Presisielandbou in die praktyk: Navorsing en Insigte vanuit die SU-BFAP Leerstoel

Andries Le Roux

Overberg Agri Voorplant dag – Mar 2026

Why Precision Agriculture Matters Now



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- Rising input cost
- Climate variability
- Yield variability within fields
- Need for better risk management



Why the SU-BFAP Chair was Established?

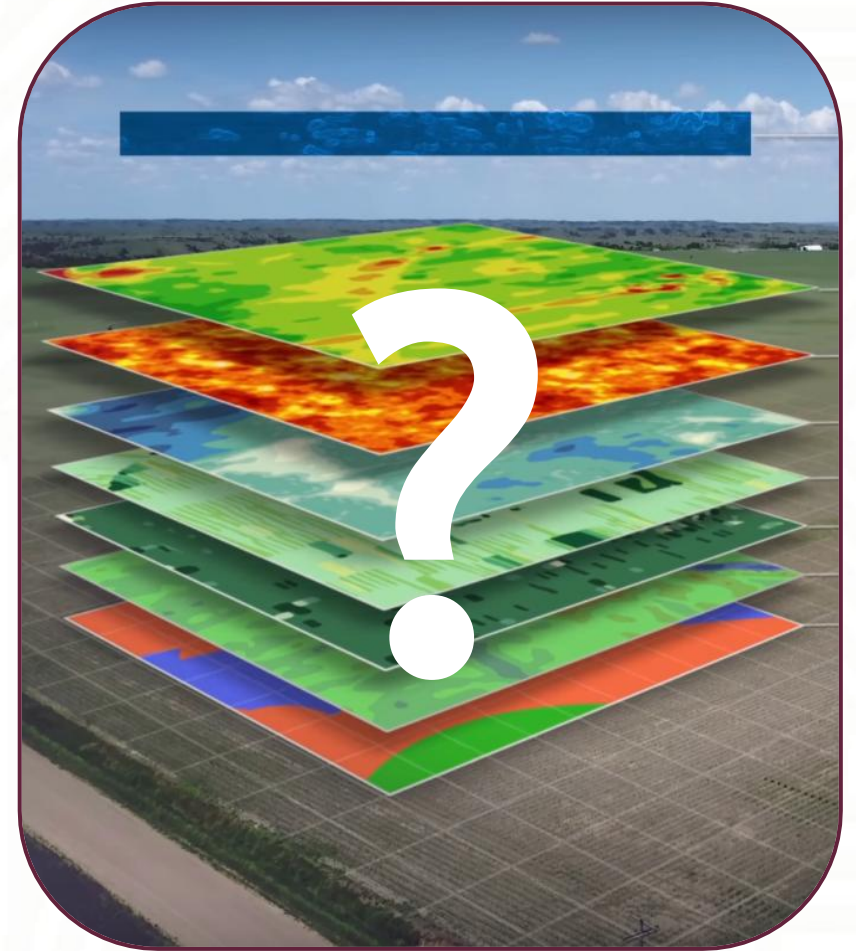


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SU-BFAP Chair:

- ✓ Independent + Unbiased research
- ✓ Leadership, Capacity Development, Training
- ✓ Test new products
- ✓ Connect technology with farmer challenges
- ✗ Not a technology-selling platform



Research outcomes including improved management practices and agronomic advice, to both large-scale and smallholder farmers.



SU-BFAP Chair in Precision Agriculture

Supported by



SU-BFAP Chair Database

DIFM project



Scaling OFPE Project



..Forthcoming Projects

Collaborating Farmers (with precision equipment/technology)

Spectrum Farmers i.t.o. farm size and access to technology / equipment

What are we currently doing?



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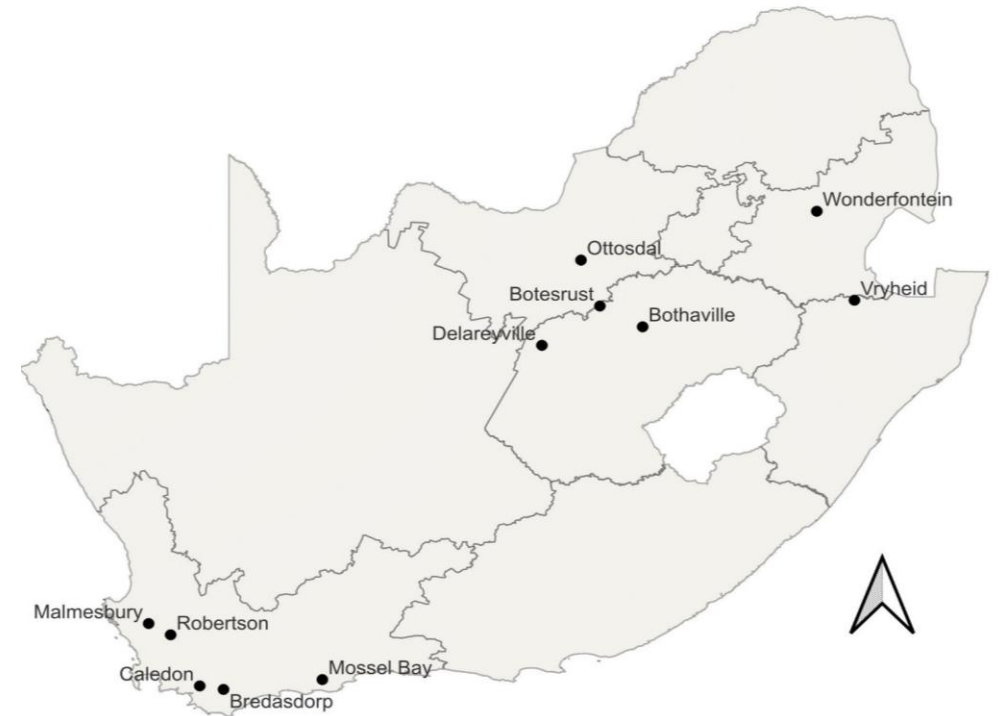
Data Intensive Farm Management (DIFM)

2019 - present

- 40 + On-Farm Precision Experimentation trials
- 8 Commercial farmers
- Maize, Soybean, Wheat, Barley, and Canola
- Multi-year datasets

Partners

- Protein Research Foundation
- Agricultural Research Council
- GrainSA
- Sasol



What are we currently doing?



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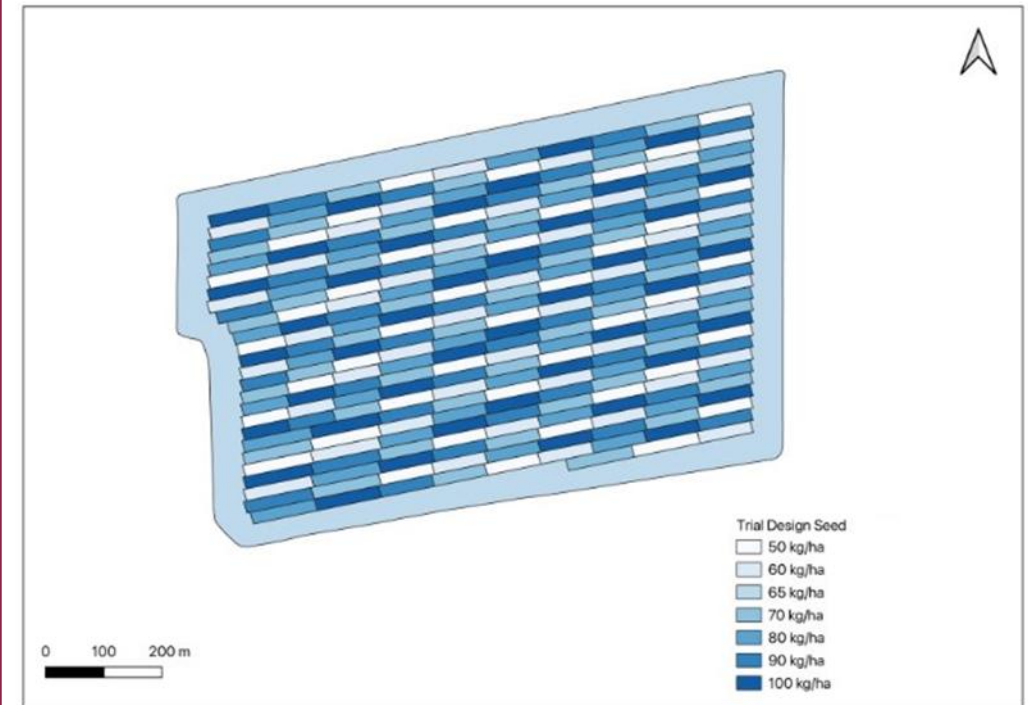
2019 - present

Key findings emerging

- Economic optimums differ across fields and seasons
- Yield maximisation does not always maximise profit
- Spatial variability drives economic variability

Industry-scale research generating independent evidence

Seeding rate (50 - 100 kg/ha)



What are we currently doing?



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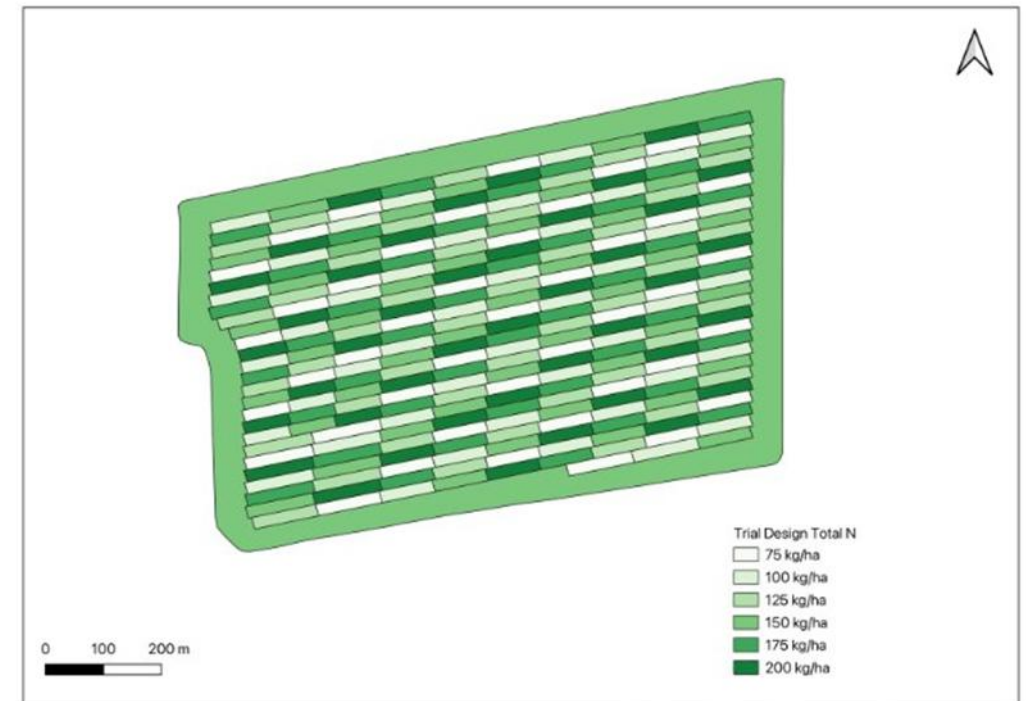
2019 - present

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Industry-scale research generating independent evidence

Fertilizer rate (75 - 200 kg/ha)



What are we currently doing?



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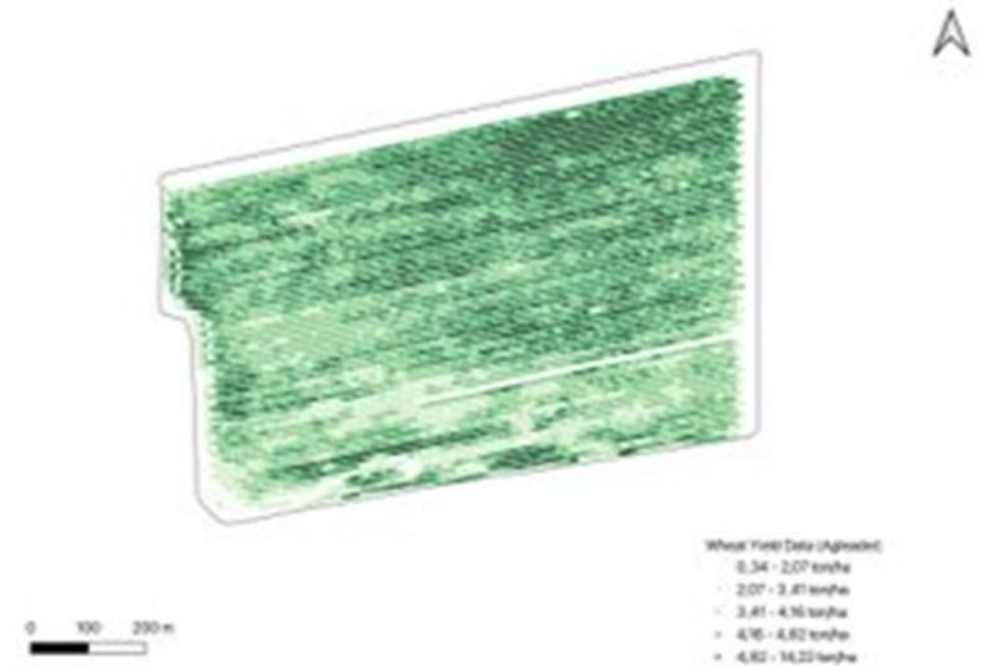
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Industry-scale research generating independent evidence

Yield data



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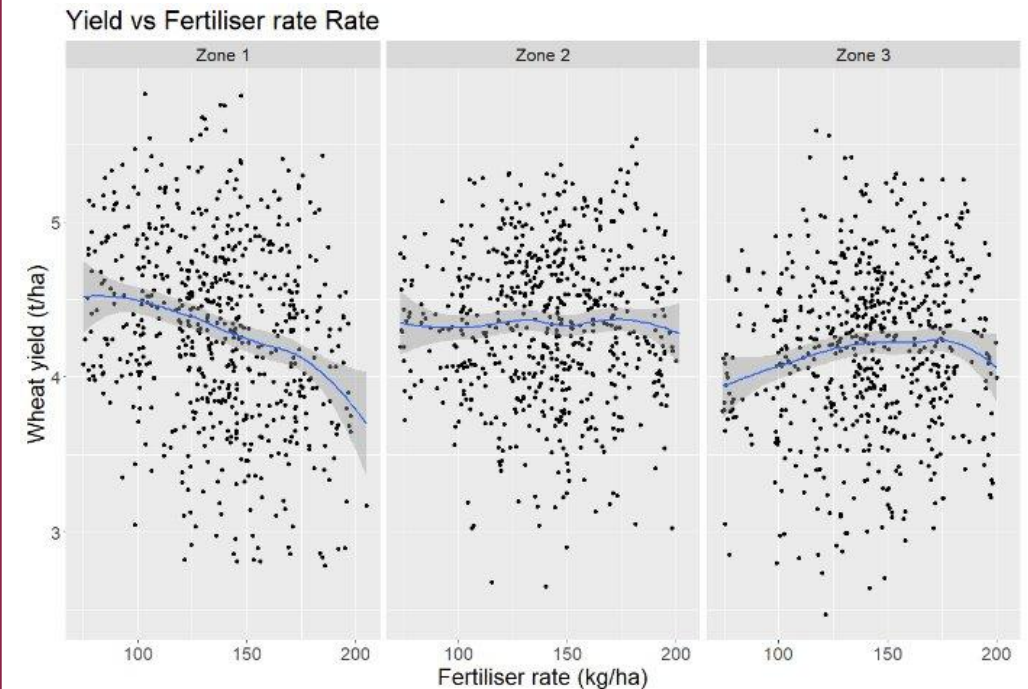
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Industry-scale research generating independent evidence

Yield vs Fertiliser rate



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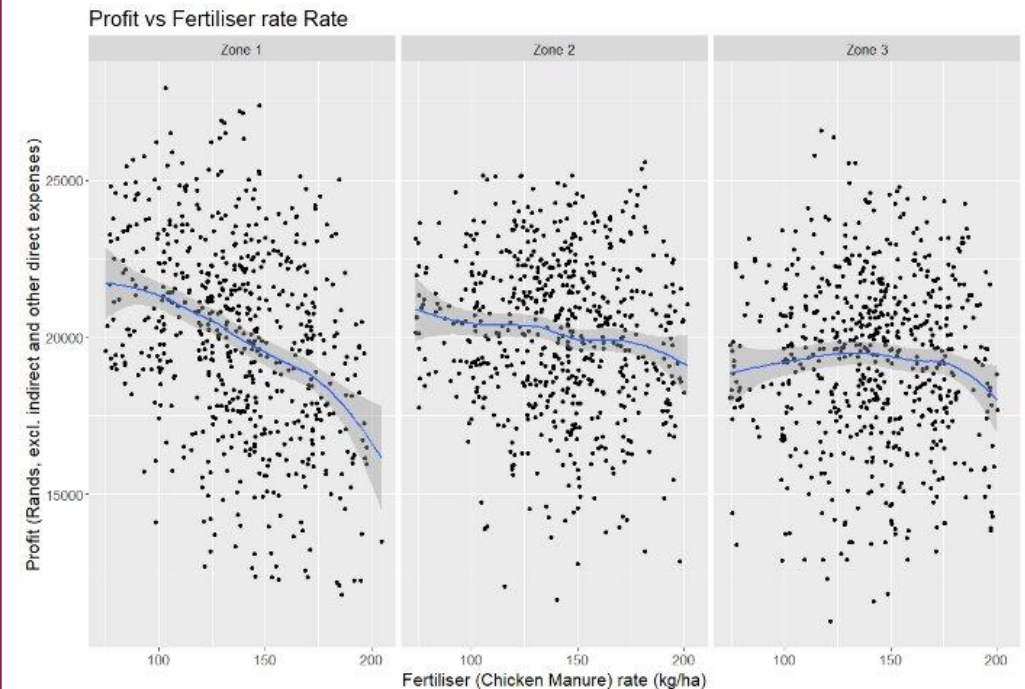
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Industry-scale research generating independent evidence

Profit vs Fertiliser rate



What are we currently doing?



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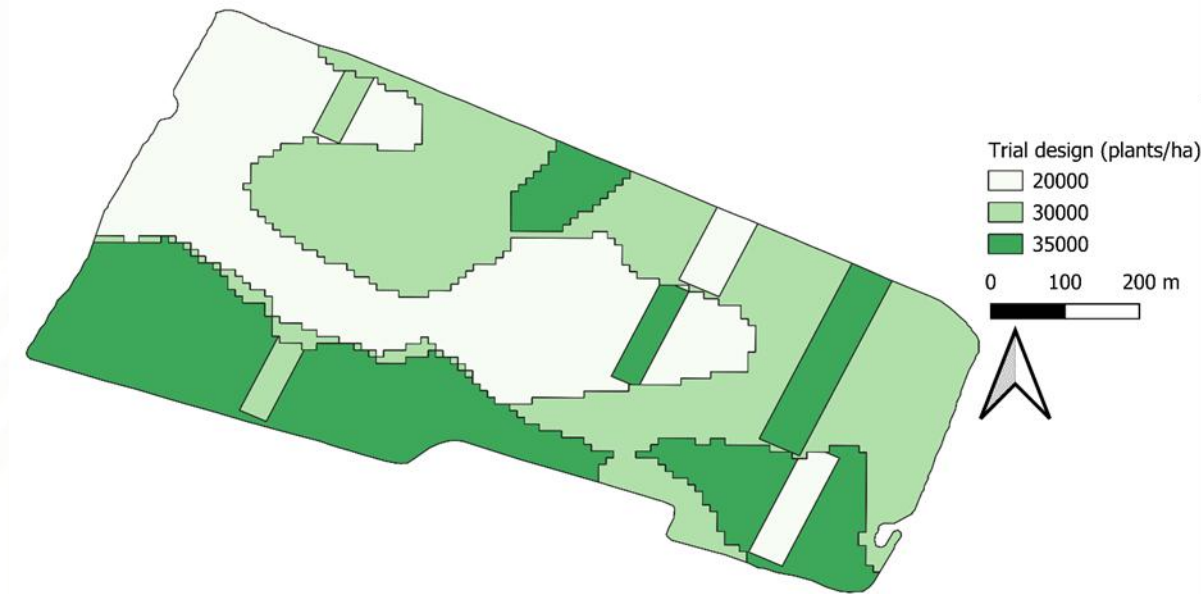
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On-Farm Precision Experimentation Project 2024 - present

- 10 On-Farm Precision Experimentation trials
- 10 Commercial farmers
- Maize and Soya
- Ongoing trials
- *Small-scale farmers (without technology)*

Partners

- OneSoil
- GrainSA



What are we currently doing?



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On-Farm Precision Experimentation Project *2024 - present*

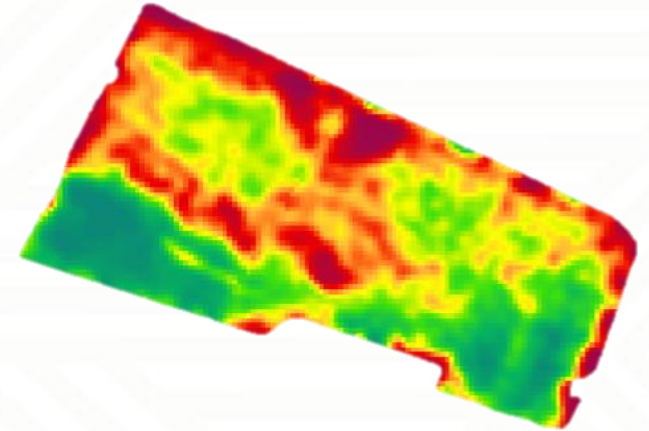
Platform:

- Three management zones
- Recommendation map development tools
- Digital infrastructure for scalability

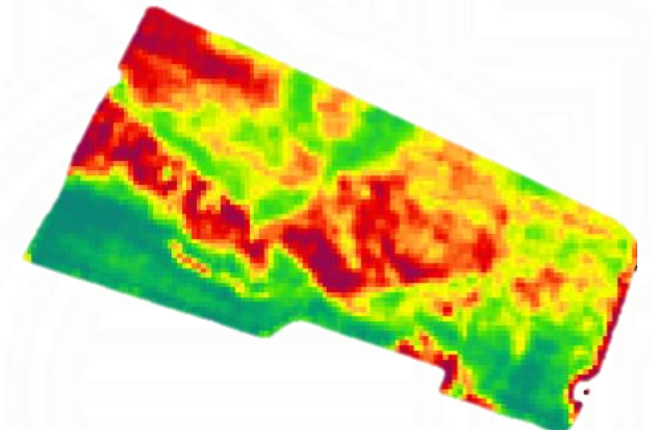
SU-BFAP Chair:

- Intendant statistical validation
- Economic interpretation of results

Yield map 2025



Productivity map 2018-2014



What are we currently doing?



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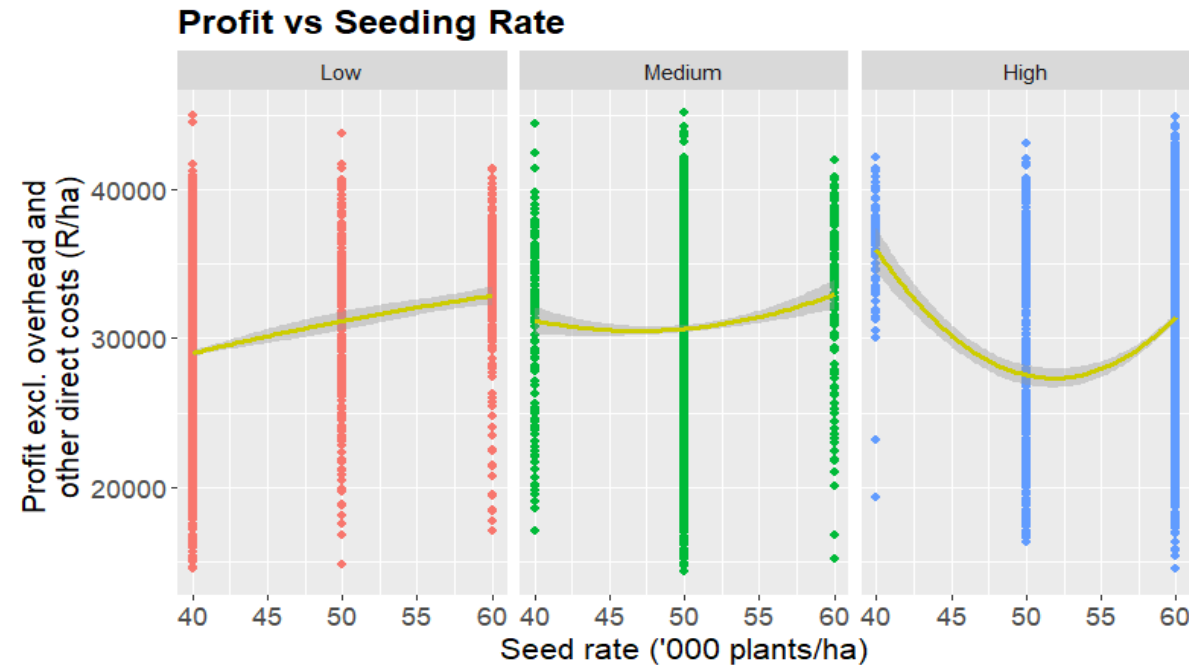
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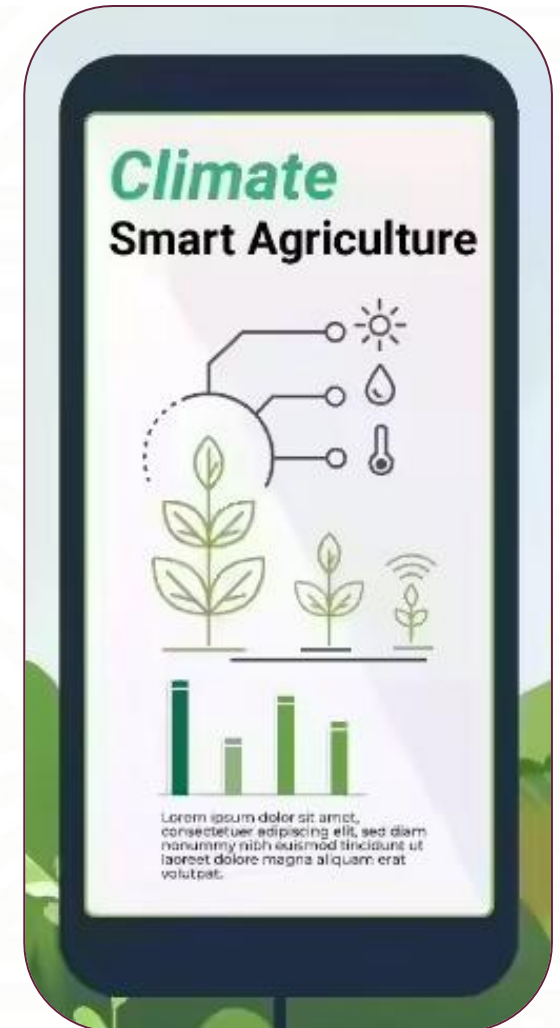
Future projects



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- 1 Climate-smart agriculture
 - Integrating weather data to on-farm trials
 - Long term datasets
 - Identifying weather-driven yield impacts
 - Drought, waterlogging, heat stress, germination temperature
 - Linked to postgraduate research capacity
- 2 GSA PGP Programme - Emerging Farmers (**OneSoil**)
 - Production zone management
 - Manual seeding rate adjustment
 - Determine optimal seeding rate per field
 - Supporting emerging farmers decision-making



Independence and Unbiased Benchmarking



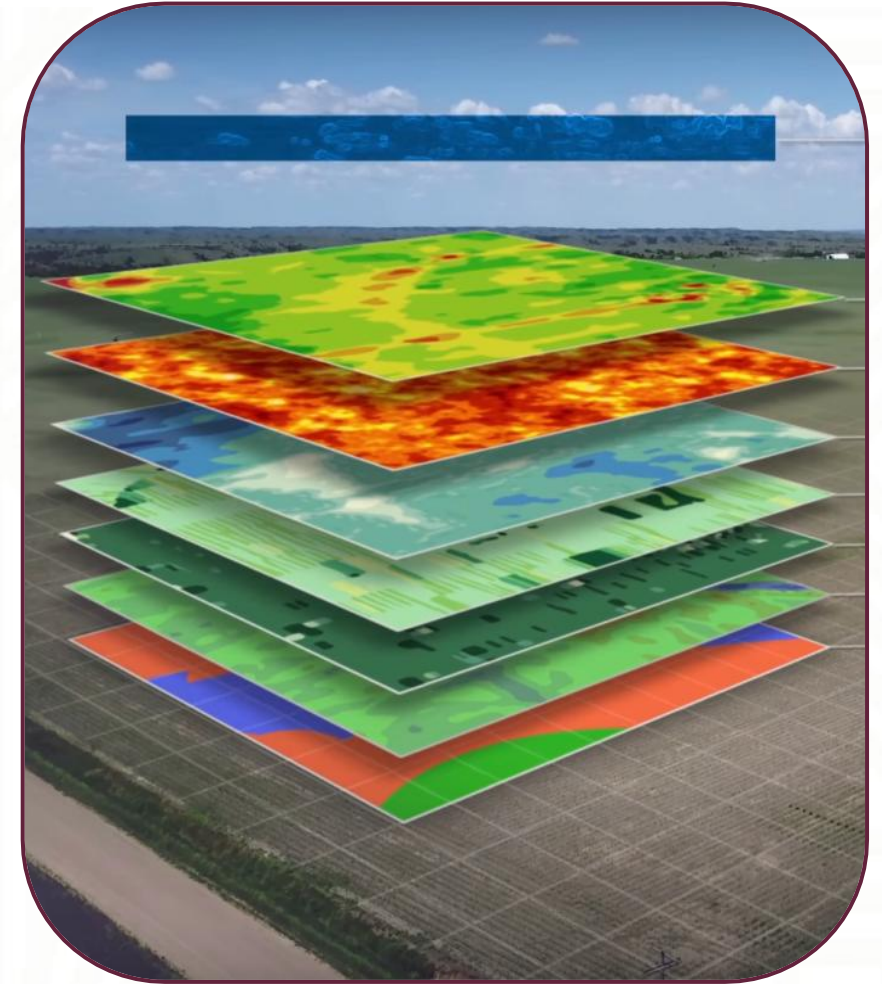
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- Independent validation of technologies
- Technologies are evolving rapidly
- Adoption rates are increasing
- Transparent benchmarking is necessary

SU-BFAP Chair

- Objective trials
- Transparent evaluation
- Credible results stakeholders can trust
- Industry collaboration



Thought leadership and Capacity development



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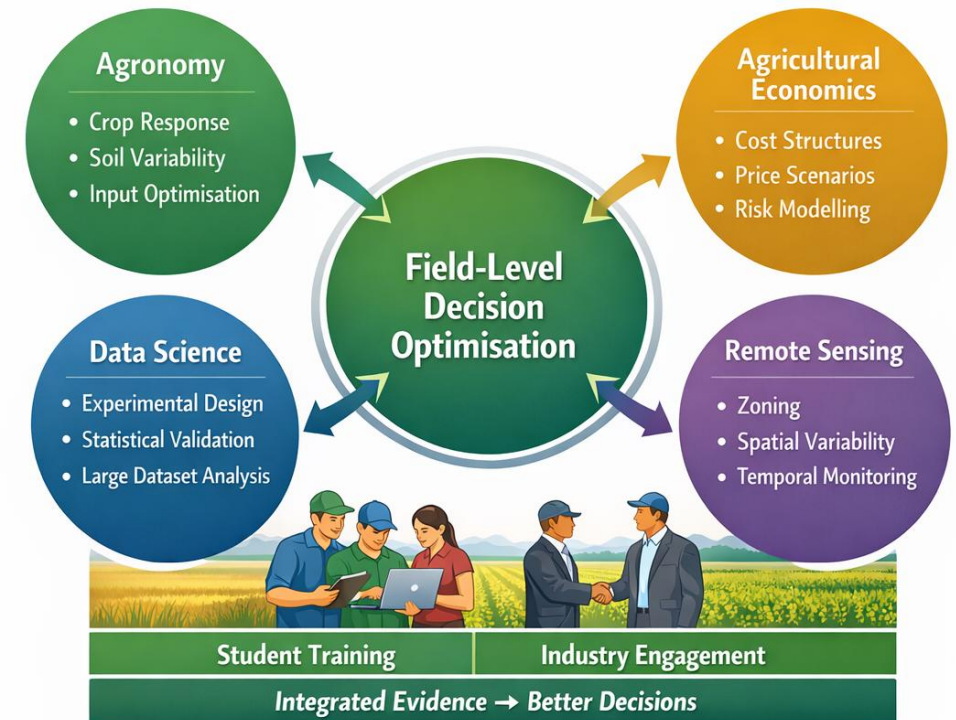
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✗ Not only agricultural trials

Interdisciplinary research program

- Agronomy
- Agricultural economics
- Data science
- Remote sensing
- Soil science

✓ Student training and industry engagement



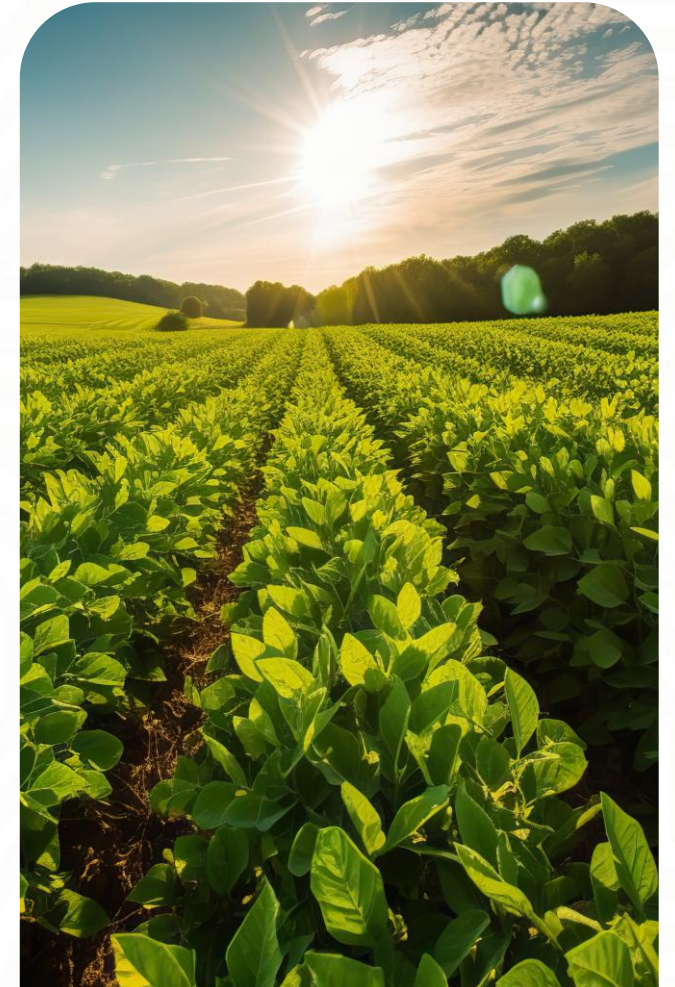
Development and Innovation



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- Connecting technology to real-world challenges
- Identifying gaps in the market
- Not only test existing tools
- Supporting development of new decision-support tools
- Ensuring relevance and sustainability



What is needed from producers, industry, and policy?



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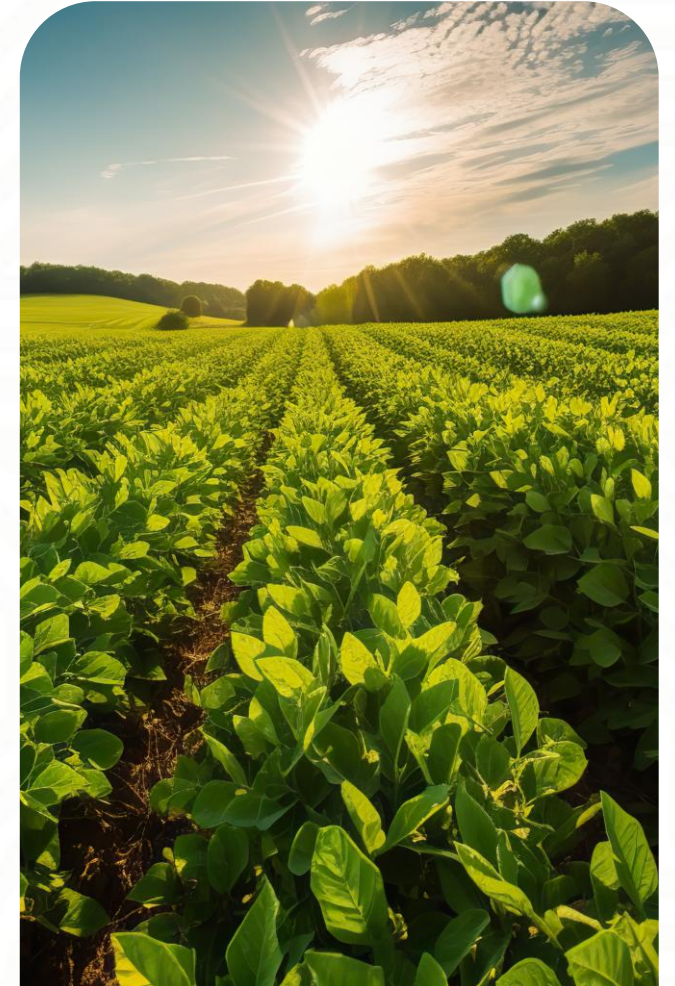
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From Producers:

- Data sharing
- Long-term partnerships
- Structured experimentation
- Openness to benchmarking

From Industry & Policy:

- Stable, long-term research funding
- Recognition of precision datasets as strategic assets
- Support for digital agricultural frameworks
- Institutional support



The Bigger Picture

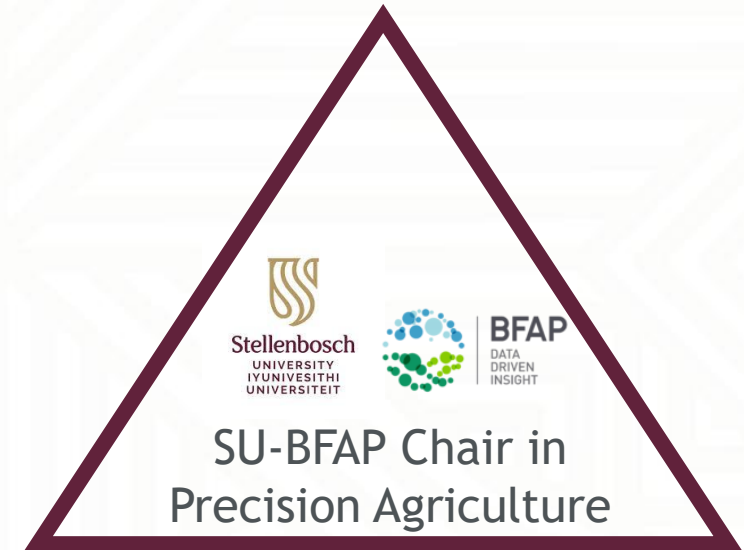


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- 1 Industry → Scale and innovation
- 2 Research → Evidence
- 3 Farmers → Validation
- 4 Policy → Stability

The SU-BFAP Chair integrates all four



Collaborators



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andriesleroux@sun.ac.za



083 419 2680

Thank You

Andries Le Roux & Karen Truter

Presentation compiled by

Publications up to date



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Scientific publications

- Adoption of precision agriculture practices in South African field crop production systems: a national survey (South African Journal of Plant and Soil)
- Assessing seeding rate management strategies for maize production in South Africa: Insights from the Data Intensive Farm Management Project (Precision Agriculture)

SA Grain Magazine

- Programme paves way for large-scale on-farm trials
- Maximising maize profitability with VRA: insights from DIFM trials
- Adoption of precision agriculture in SA: insights from a national survey
- Why variable soil properties still sets the limit in Western Cape wheat production systems
- Precision agriculture in action: Scaling on-farm experiments for profitability

Oil Seed Focus:

- DIFM-project: Lessons from on-farm variable soya bean seeding rate trials