EVALUATION OF SHORT TERM N-EFFECT OF RECYCLING-DERIVED FERTILIZERS (RDFs) FOCUSSING ON CROP YIELD AND N LOSSES

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Large **surpluses** of on farm nitrogen (N) and phosphorous (P) are nowadays **processed** and exported while synthetic **mineral N fertilizer** is used for crop production. A legal recognition of RDFs as **potential synthetic fertilizer** may invert this paradoxical situation but a thorough evaluation of potential RDFs is needed.

Difficulties evaluating RDFs in on site experiment:

- Application representative for common practice
  - Custom made trial fertilizer machine
- Countering soil variability
  - Field selection (homogenous)
  - Preliminary screening omitting aberrant field sections
  - Split – plot statistical design

Agricultural value: focus on short term N-effects:

- Dose response curves in 3 crops (maize, spinach, potatoes)
- 4 doses (0%, 40%,70%,100% of advised N dose)
- Slight overdose for other nutrients (P, K, S)

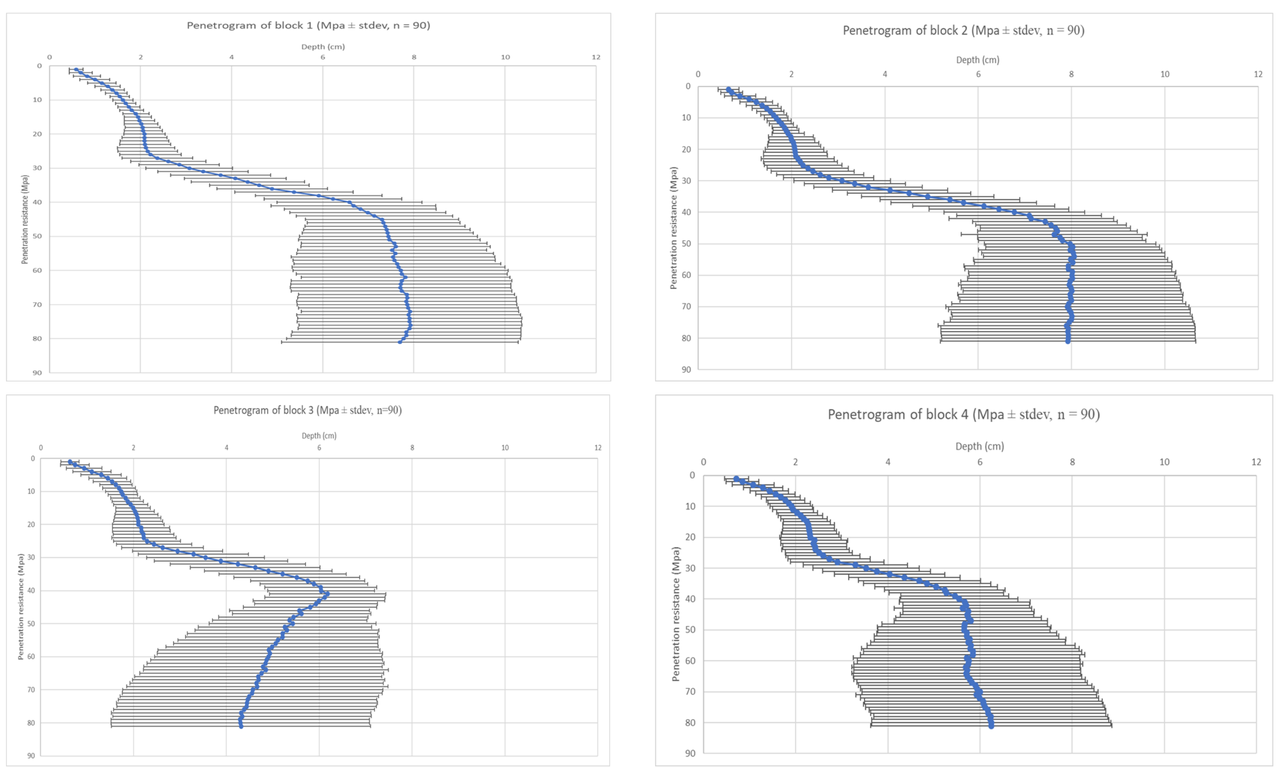
Environmental impact, N-balance on plot level:

- N-supply:
  - N-stock before trial installation
  - Atmospheric deposition
  - N-mineralisation
  - Organic and mineral N-fertilizers
- N-losses:
  - N-stock after harvest
  - Crop uptake
  - Volatilization, denitrification and immobilization (calculated)

Preliminary screening and trial setup:

39 different sectors

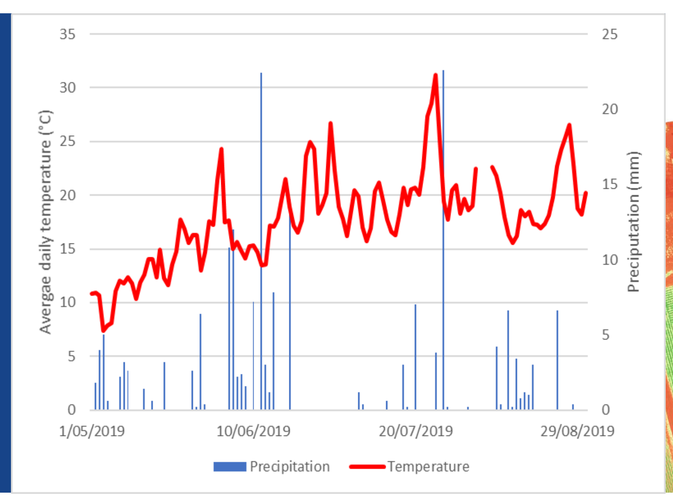
- NDVI (drone) of preceding crop (grassland)
- Analysis of top soil (%C, pH, TON, macro and- micronutrients)
- Soil structure (penetration resistance)

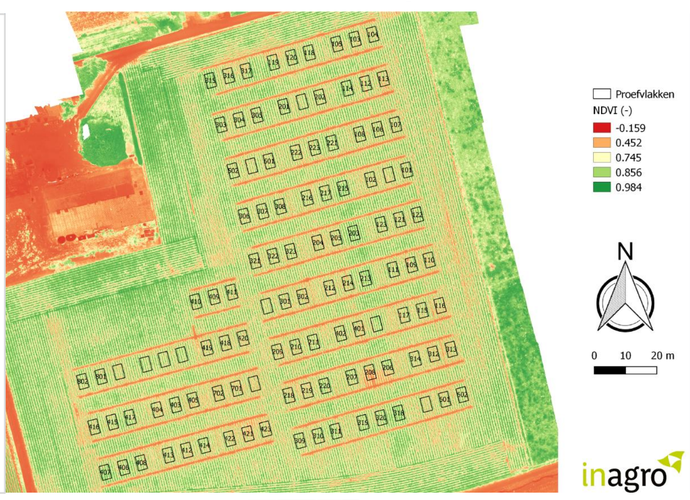


Observation and measurements:

Frequent NDVI (drone), destructive measurements at harvest, frequent soil samples

Weather conditions: Extremely dry and hot in July and August.





Extreme drought and heat causing interference :

- Water availability (sandy soil) becomes limiting factor more than N-availability.
- Extreme heat (40+°C) induces stress and early stop of vegetative growth.

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