GeoPard Agriculture

All-in-One Precision Ag Mapping Platform

January 2025

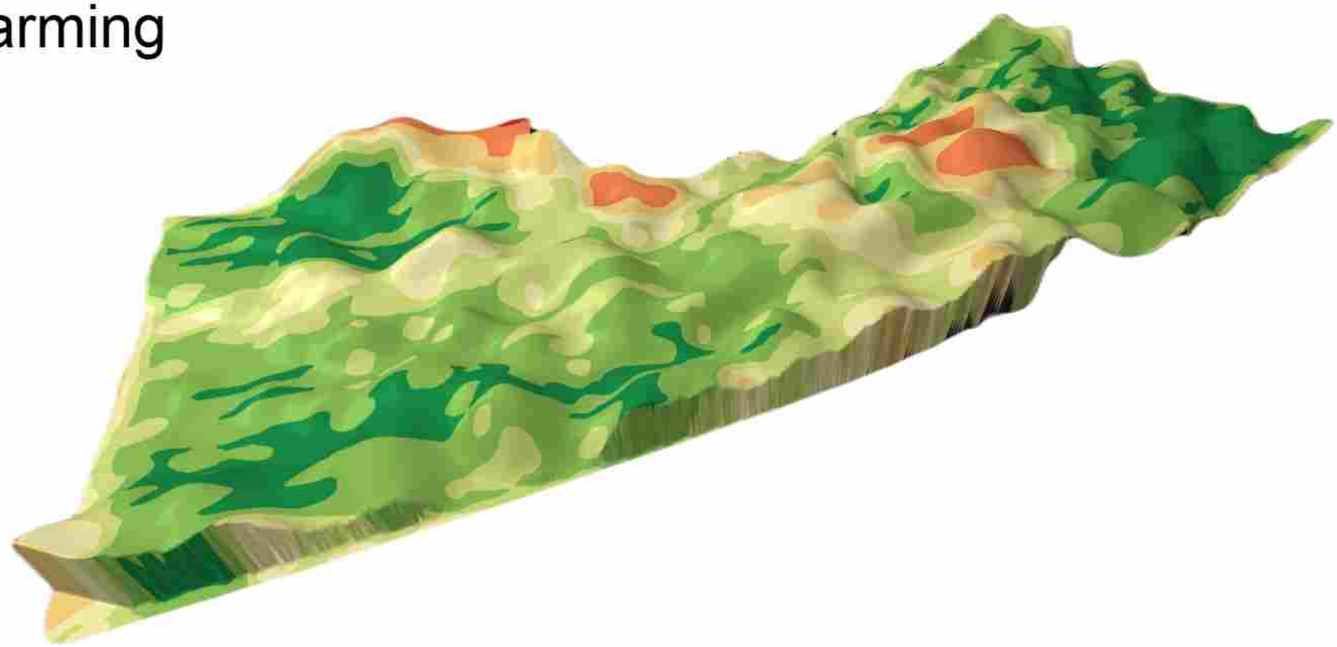
https://geopard.tech

dmitry.dementiev@geopard.tech

Digital Twin of a Field

- ✓ Yield increasing 10%
- ✓ Saving fertilizer 30%
- ✓ Decrease usage of chemicals, up to 50%
- ✓ Sustainable & Regenerative farming

Savings:€100 / hectare/ year

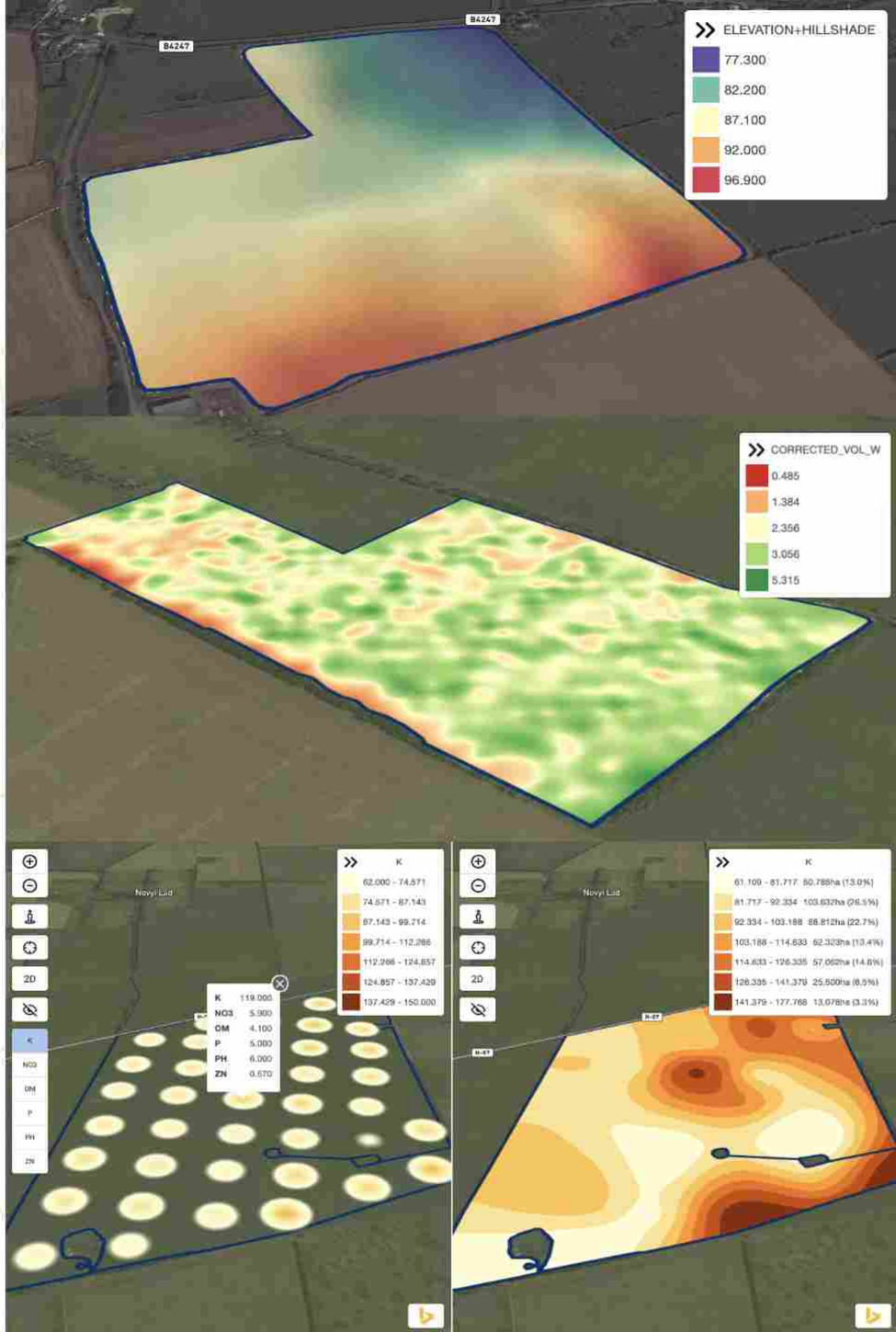


How to create smart recommendations?

Topography
Slopes
Historical Vegetation
Current season vegetation
Weather
Soil data
- OM
- pH
- CEC
    - EC
    - N, P, K
    - Micronutrients

Yield data
- Grain moisture
- Protein

Tissue (plant) sampling
Soil moisture
...



Automated Platform | Precision Agriculture

Team

Build solutions as one team for 10+ years in Precision Agriculture

2012	2015	2019
Co-founders of Zoner, **acquired by Bayer** in 2015	Technical Managers of Bayer Xarvio, acquired by BASF	Co-founders of GeoPard Agriculture
Developed VRA maps engine widely used in the US, Canada, Europe	Mastered integration and developed foundation of Xarvio Field Manager, incl. GIS engine	**Automated decision support system**

Agricultural Season with GeoPard

GeoPard Agriculture
Simplify complexity

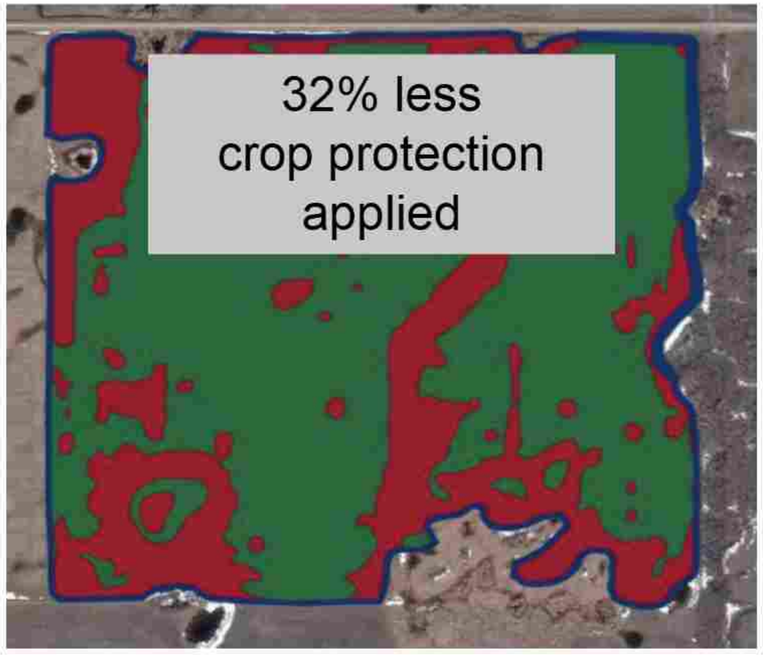
GeoPard Agriculture
Simplify complexity

Agronomic Use Cases

VR fungicide application

Data: Current vegetation & bare soil

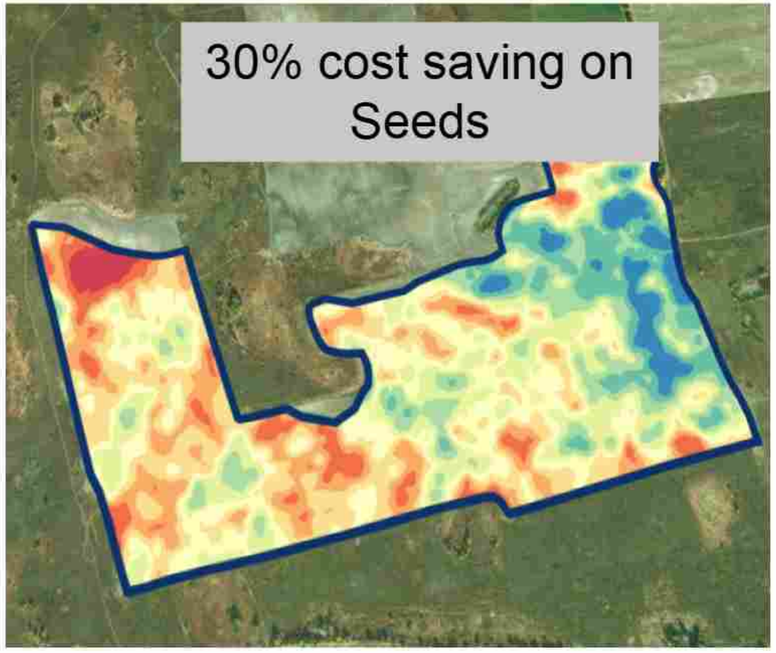
Crop: wheat



VR seeding

Data: Soil sampling (OM) & Topography & Last 15 years vegetation

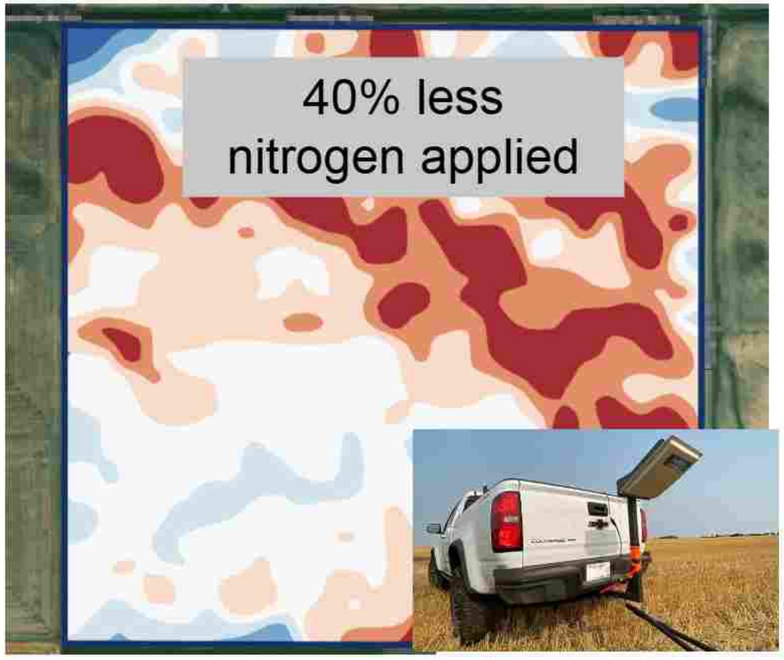
Seeding rate: 60к-85к / hectare/ corn



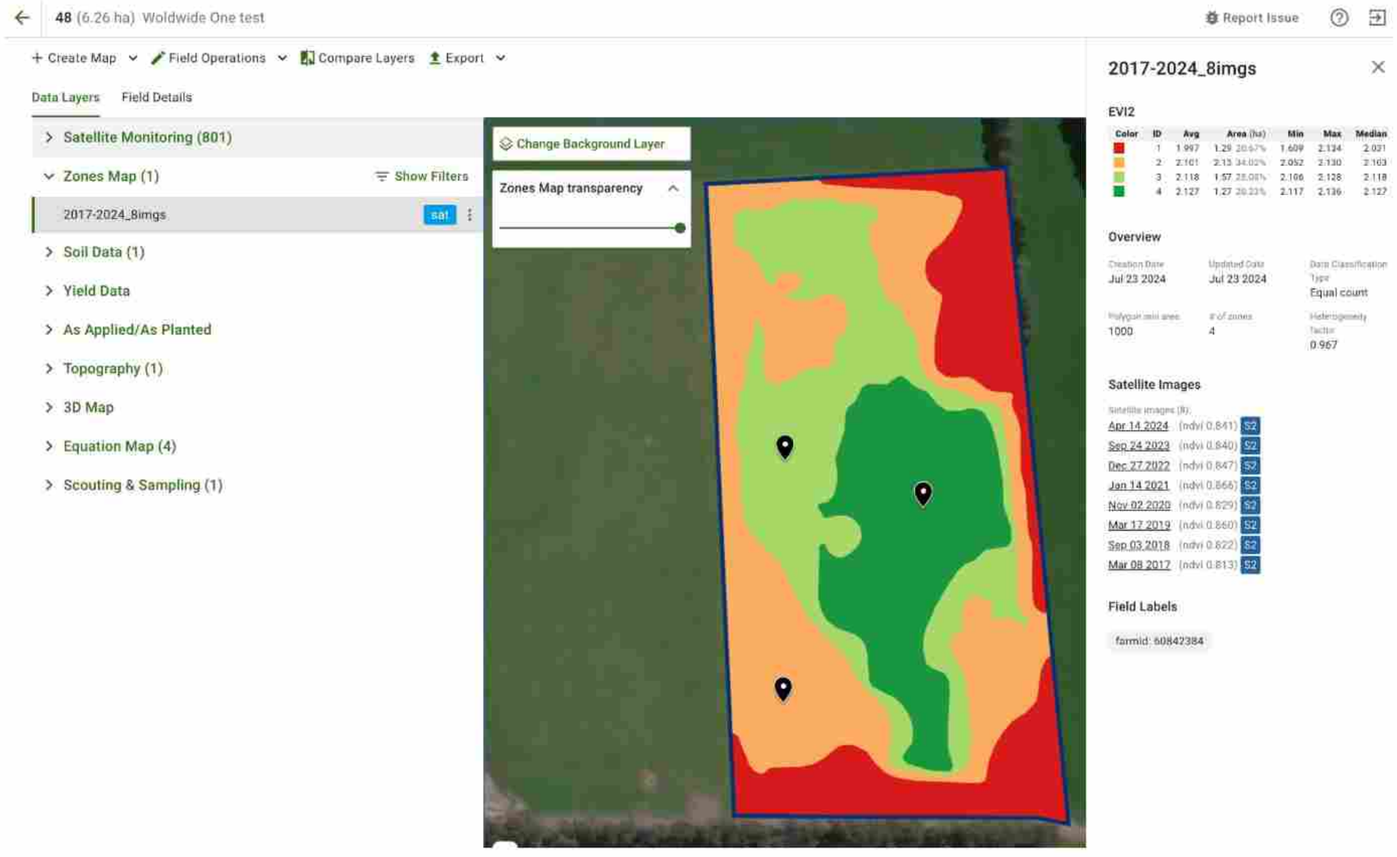
VR fertilizing

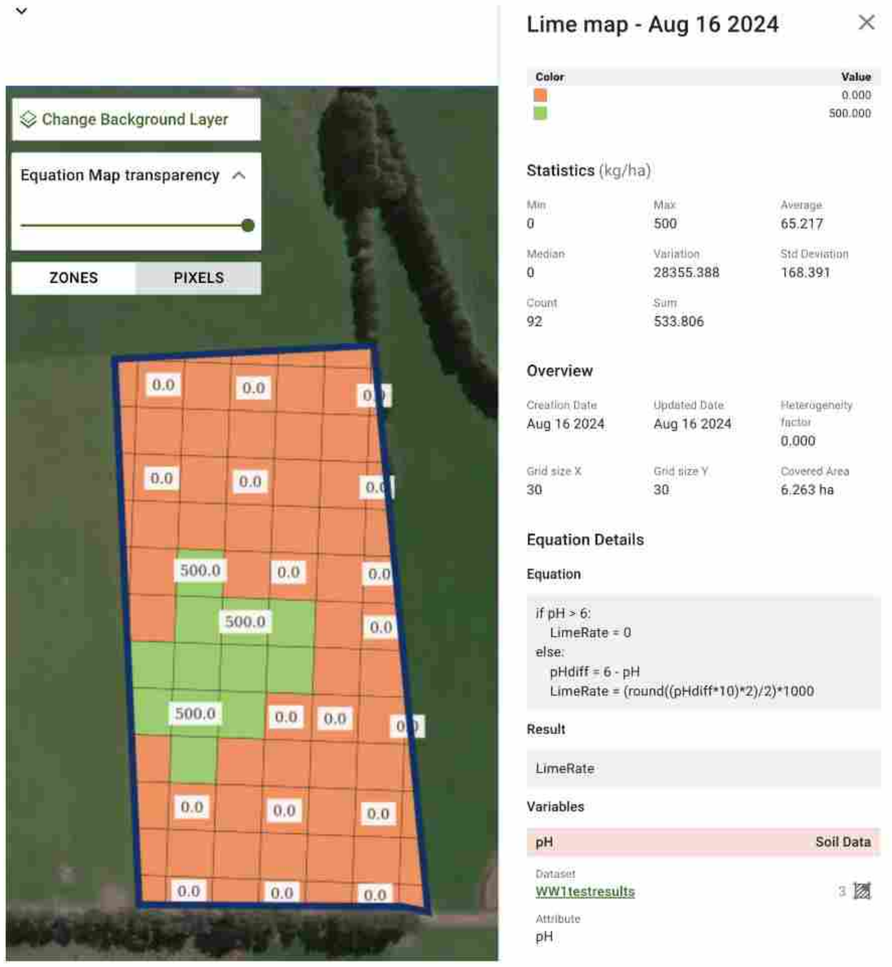
Data: ground scanners (SoilOptix, GeoProspectors, Electrical Conductivity), Topography, Historical vegetation

Crop : Canola



Soil Sampling Recommendations - New Zealand - 50% fert. cost reduction





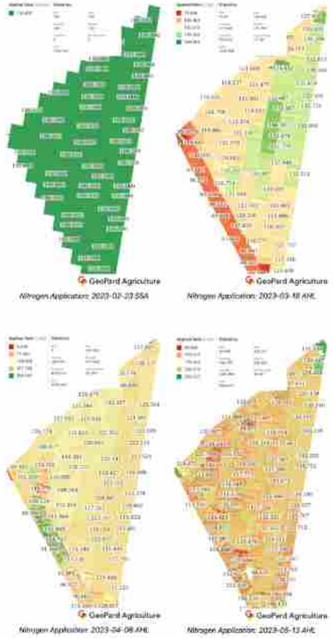
Fertilizer (Nitrogen) Use Efficiency Calculations

Protein

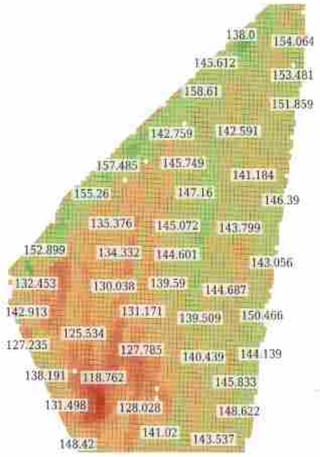
+ Yield

+

Fertilizer Applied



Nitrogen Uptake



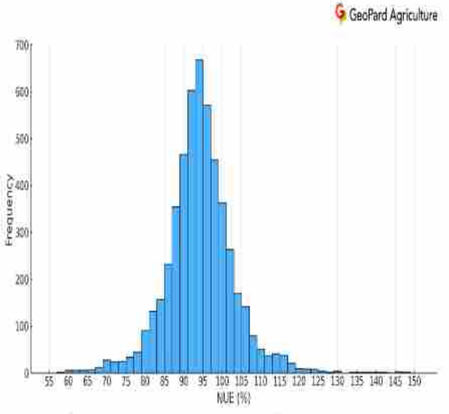
Statistics (kg / ha)

Min	Max	Average
106.405	183.436	141.321
Median	Variation	Std Deviation
142.084	99.39	9.969
Count	Sum	
5220	1819.76	

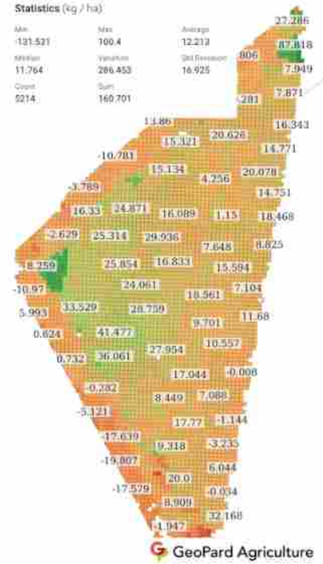
Nitrogen Uptake (NU) 2023

Nitrogen Use Efficiency (%)

Distribution of Nitrogen Use Efficiency (NUE)

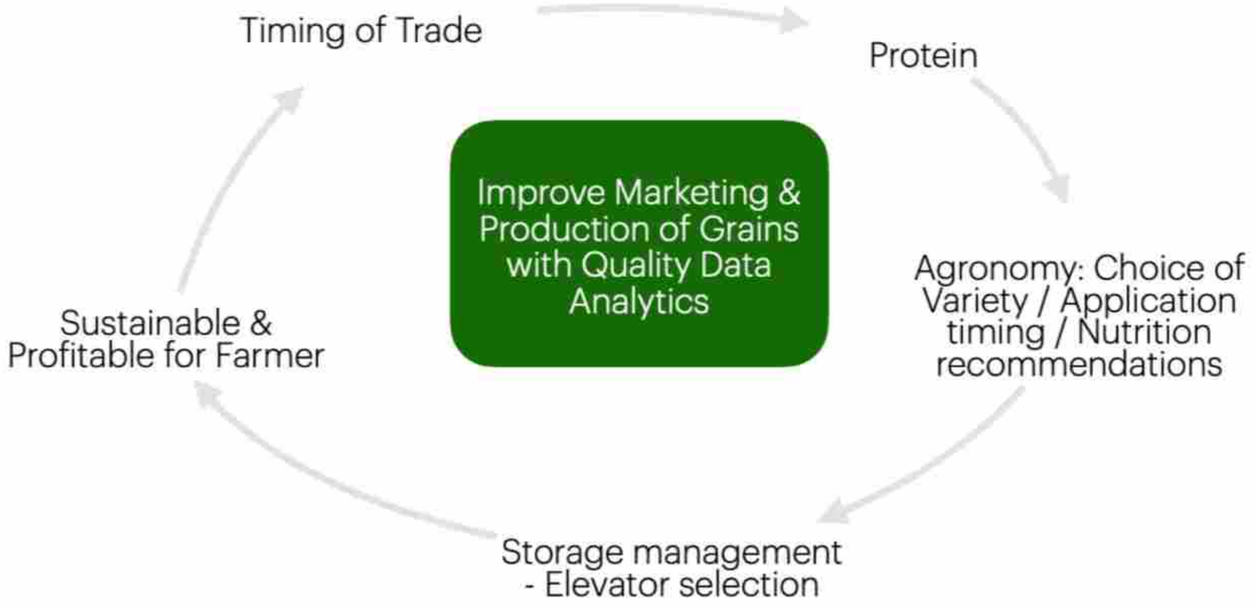


Nitrogen Surplus (kg/ha)

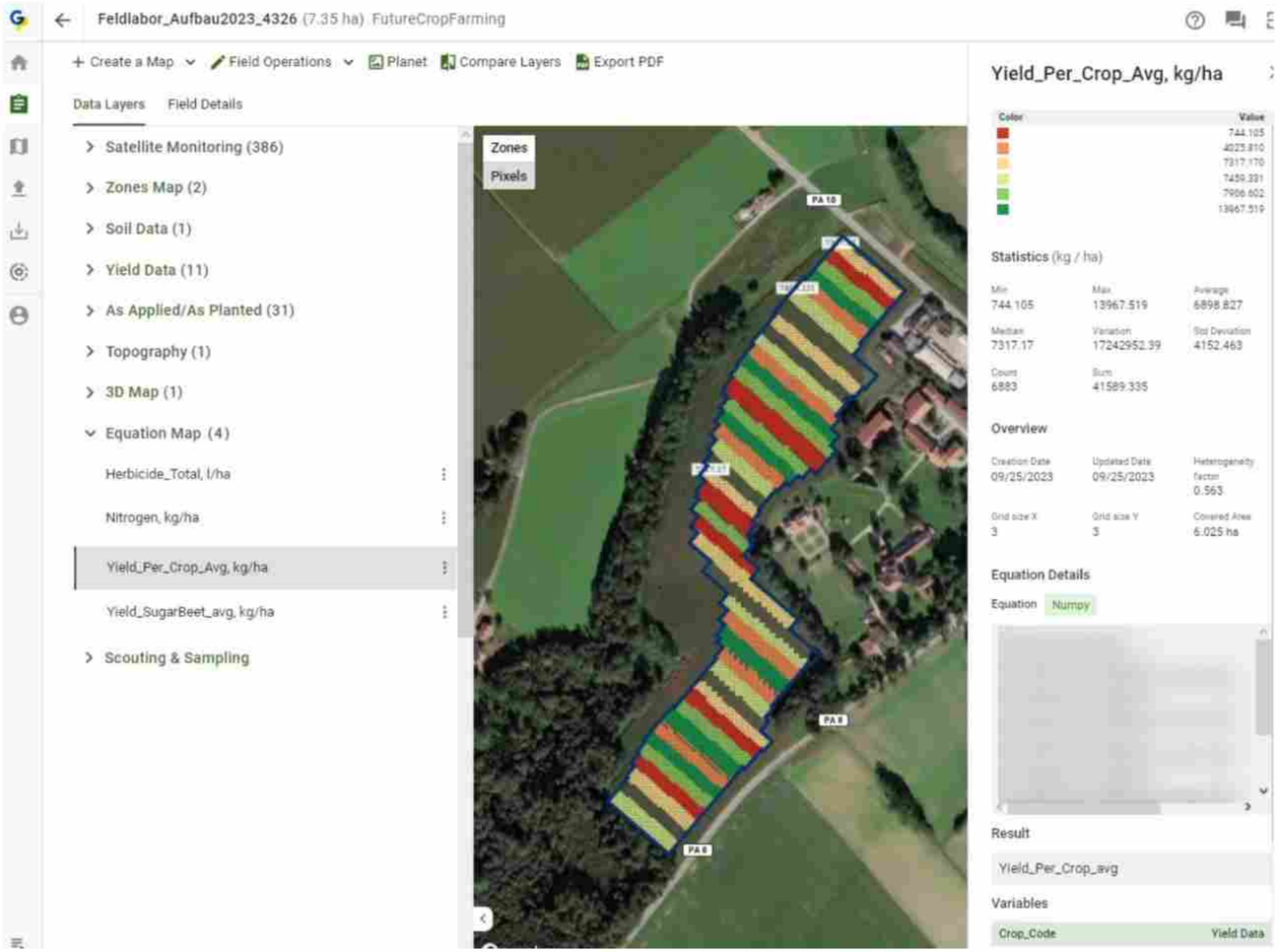


[Read in GeoPard Blog]

JohnDeere Ops center & Grain Sensing Integration



Measure Regenerative Farming



LfL

https://www.future-crop-farming.de/

GeoPard Agriculture
Simplify complexity

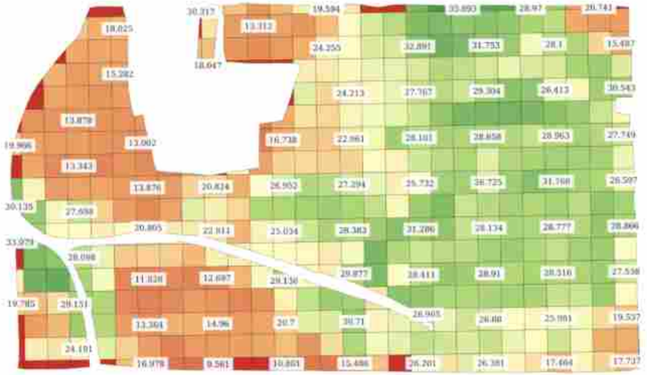
Profit Maps


+ Create a Map
Field Operations
Planet
Compare Layers
Export PDF
Data Layers
Field Details
Zones
Pixels
Negative margin area
Low margin area
High margin field area
High margin field area
mapbox
Profit Map 2022 - 1ha
Color
Value
-405.45
-126.74
151.97
430.68
Profit statistics incl. total sum
Statistics (EUR / ha)
Min
-405.451
Max
430.681
Average
87.905
Median
115.035
Variation
16650.508
Std Deviation
129.037
Count
290
Sum
27639.877
Variables
Solution_1
As Applied/As Planted
Dataset
Application 2022-06-23 Раствор
Attribute
AppliedRat
Solution_2
As Applied/As Planted
Dataset
Application 2022-07-10 Раствор
Attribute
AppliedRat
Amophos
As Applied/As Planted
Dataset
Application 2022-05-18 Амофос
Attribute
AppliedRat
Seed
As Applied/As Planted
Dataset
Seeding 2022-05-18
Attribute
AppliedRat
Yield_Wet_Tons
Yield Data
Dataset
Harvest 2022-08-31
Attribute
WetMass
Yield_Moisture
Yield Data

Equation based Analytics

- Integrate multiple data layers.
- Use GeoPard templates or **create your formulas**.
- Calculate sub-field level ROI and economic efficiency.
- Integrated Variable Rate recommendations.

[Blog post with examples]



Tri-State: Indiana and Michigan Liming Rates for Organic Soils

PDF Source

When the Target pH is 5.3 and the soil pH is < 5.3, then the LR = 37.6−(7.1 x soil pH).
When the Target pH is greater than 5.3 and the soil pH is < 5.3, then the LR = [37.6 x (7.1 x soil pH)] + [(target pH−5.3) x 5.0].
When the Target pH is greater than 5.3 and the soil pH is > 5.3, then the LR = [(target pH−soil pH) x 5.0]

Equation in Python

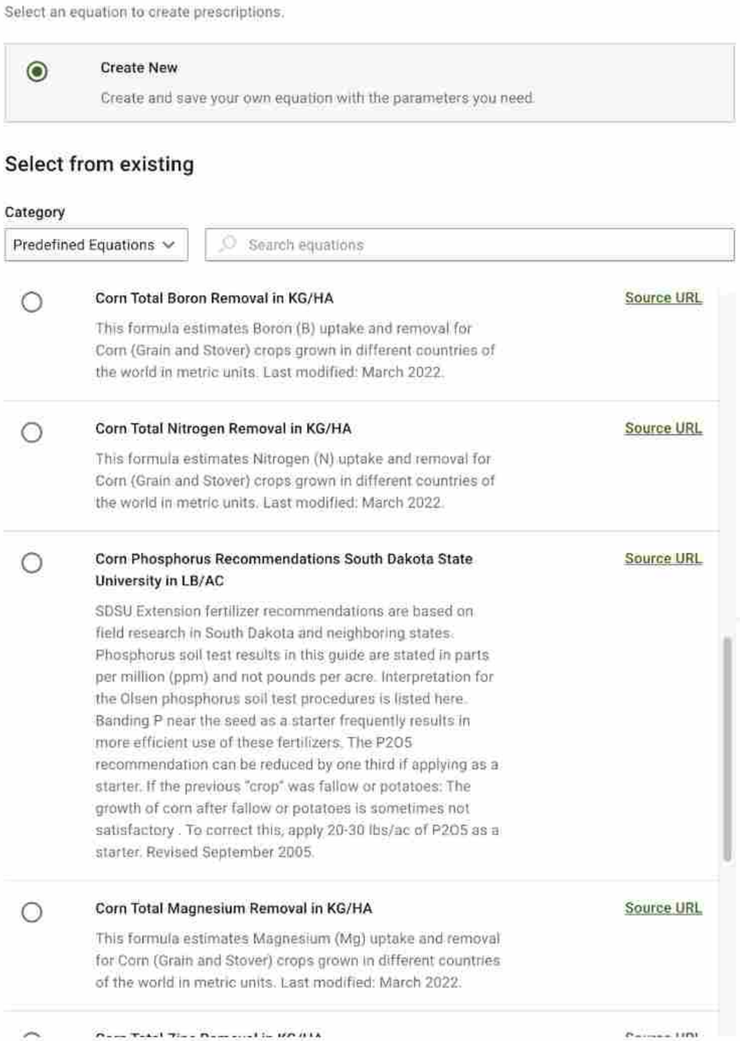
```
if targetpH == 5.3 and soilpH < 5.3:
  rerturn  37.6−(7.1 x soilpH)
elif targetpH > 5.3 and soilpH < 5.3:
  return  (37.6 * (7.1 * soilpH)) + ((targetpH−5.3) * 5.0)
elif targetpH > 5.3 and soilpH > 5.3:
  return  ((targetpH−soilpH) * 5.0)
else:
  return defaultLimeRate
```

Variables from datasets

targetpH

soilpH

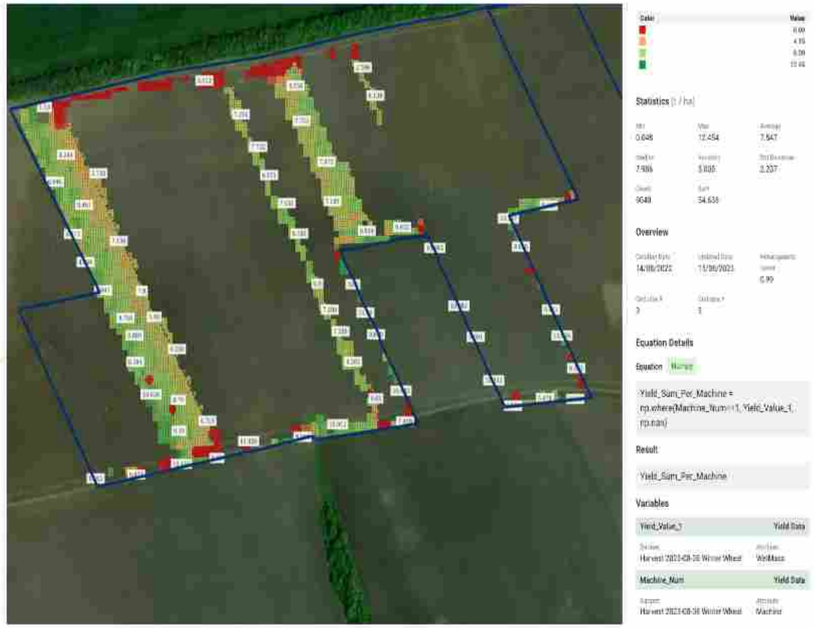
Agronomic Formulas (500 and growing)



... Your Formulas

GeoPard Agriculture
Simplify complexity

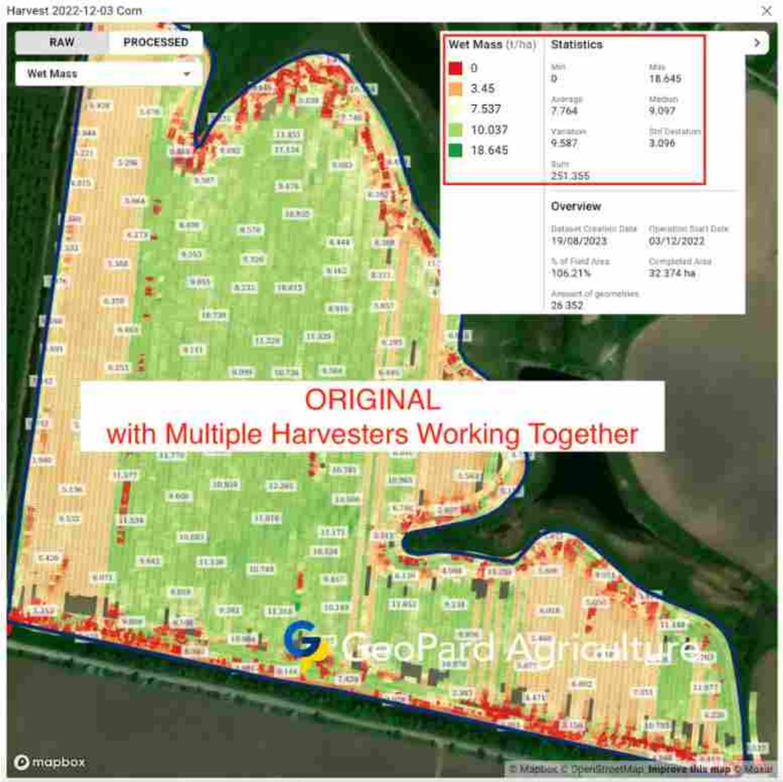
Trial Management & Analytics

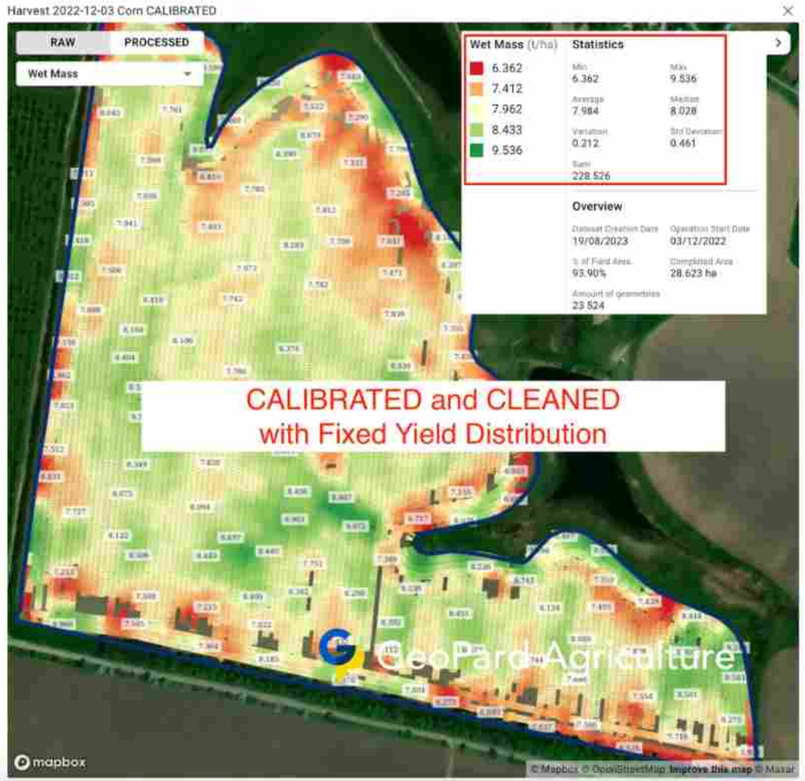


Average Yield per harvester

Yield per zone, including Trial block

Yield Auto-Cleaning and Auto-Calibration



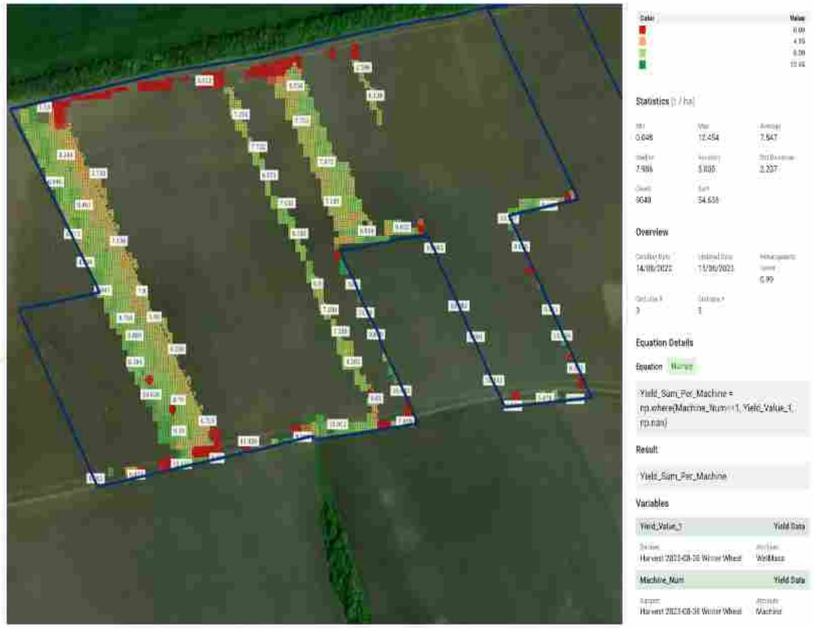


AI & Rule-based models enable automated yield data cleaning & calibration

Automatically calibrated data from several harvesters

Smart Cleaning of abnormal values and j-hooks

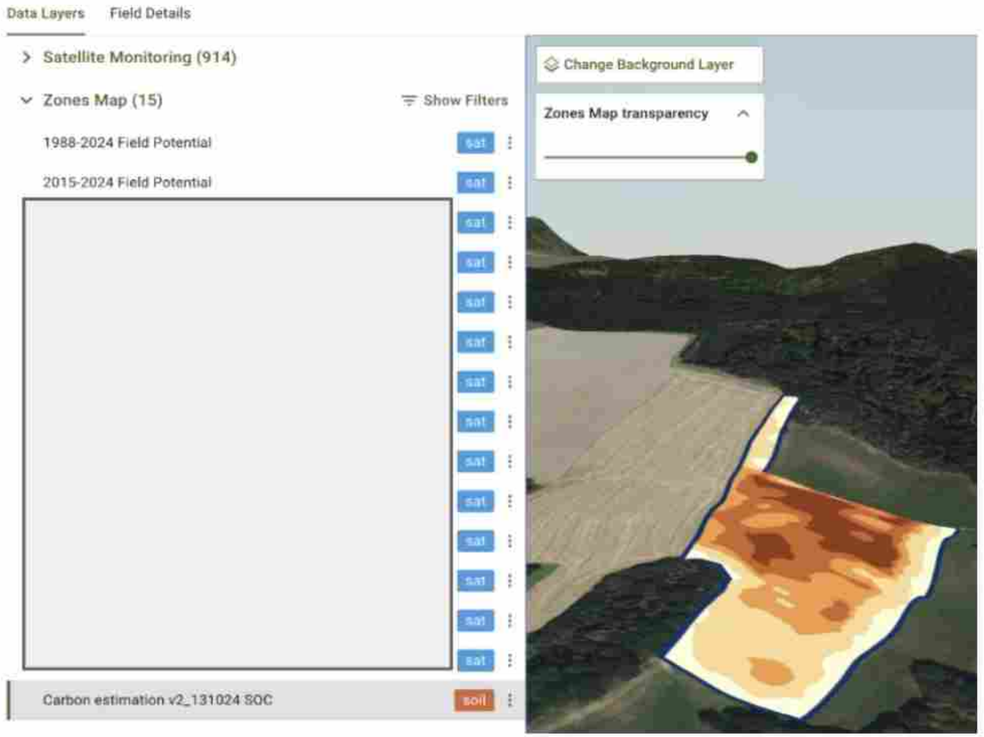
Trial Management & Analytics



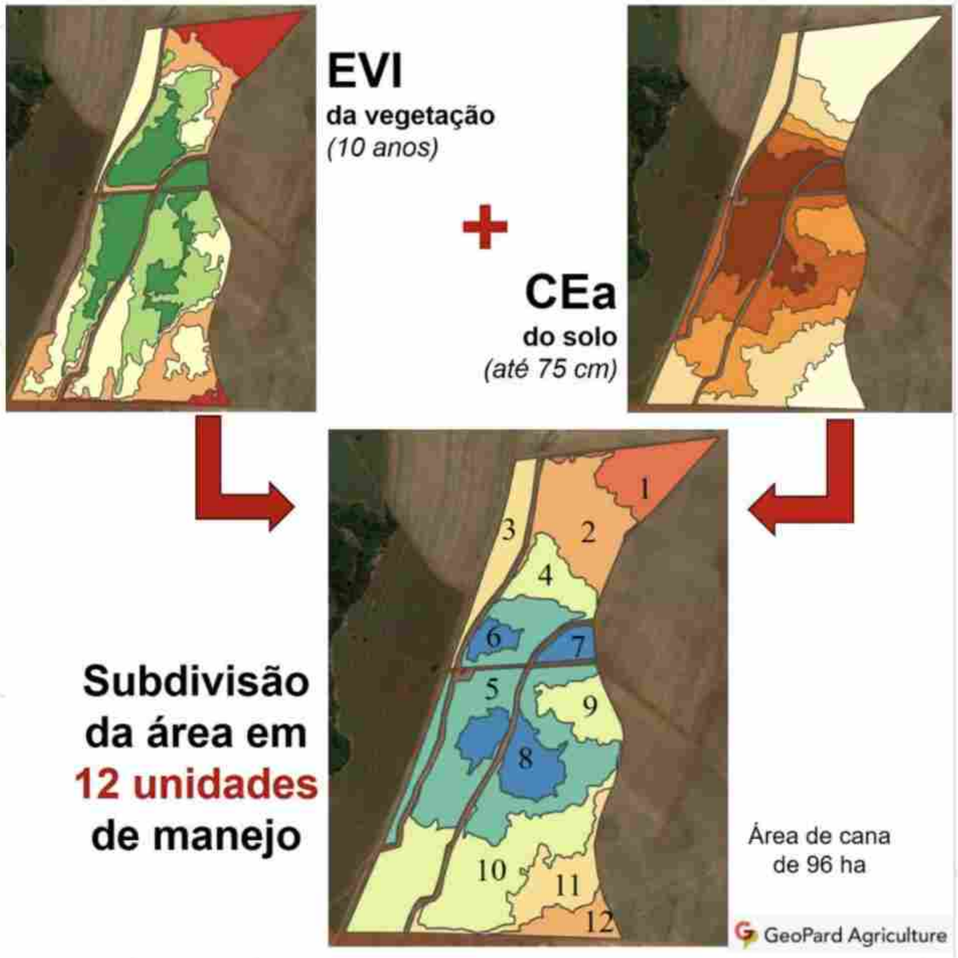
Average Yield per harvester

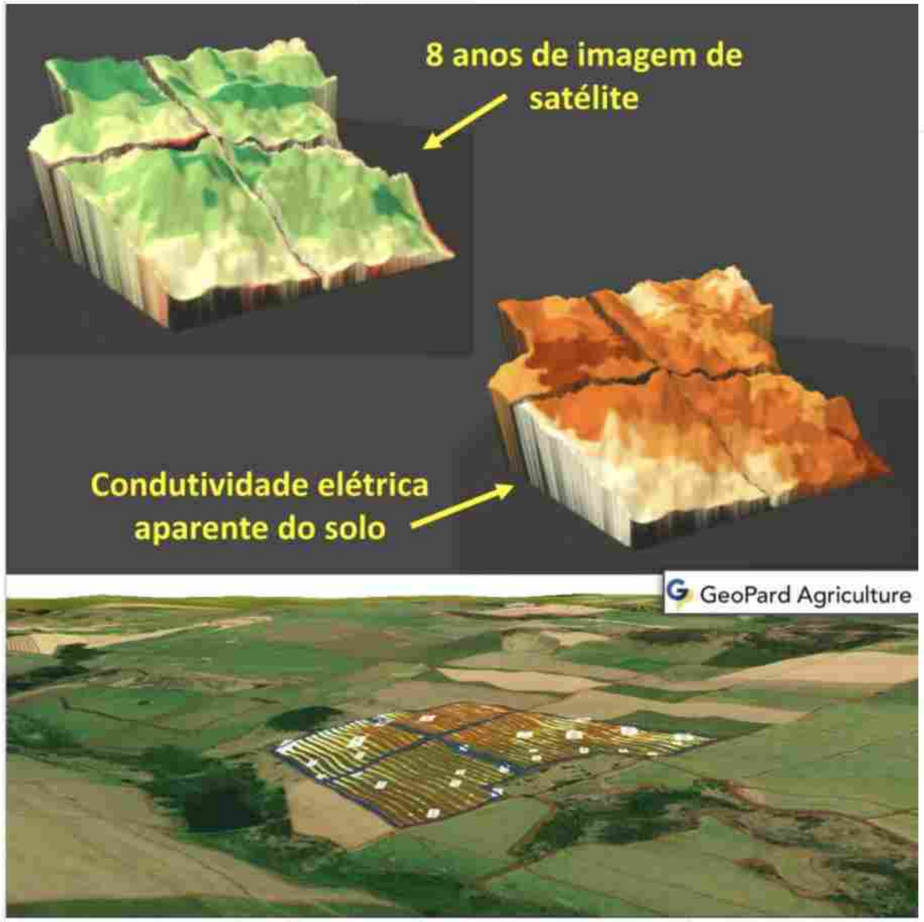
Yield per zone, including Trial block

Soil Organic Carbon - 80% accuracy



Use-Cases From Brazil - Soybean



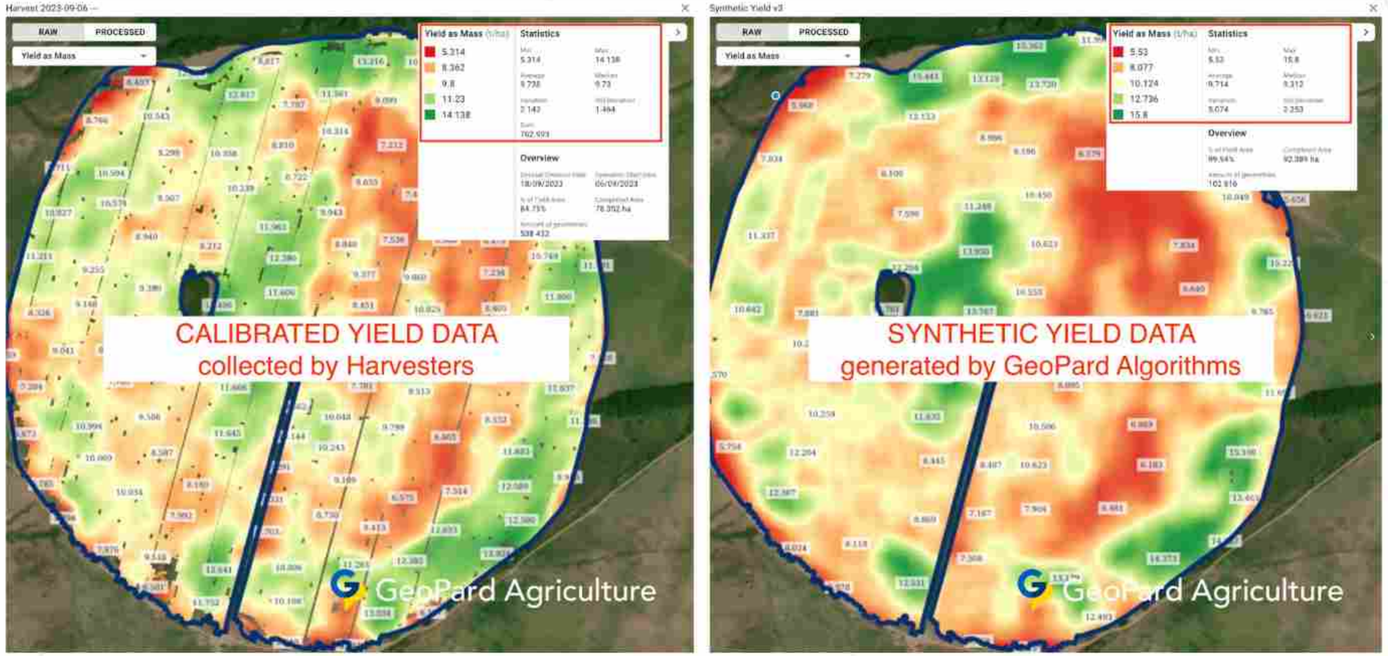


PrecisionAg
Professor - Lucas Rios do Amaral

Synthetic Yield Maps

87% Accuracy

Based on total or average yield
GeoPard creates Yield dataset
[Read more]



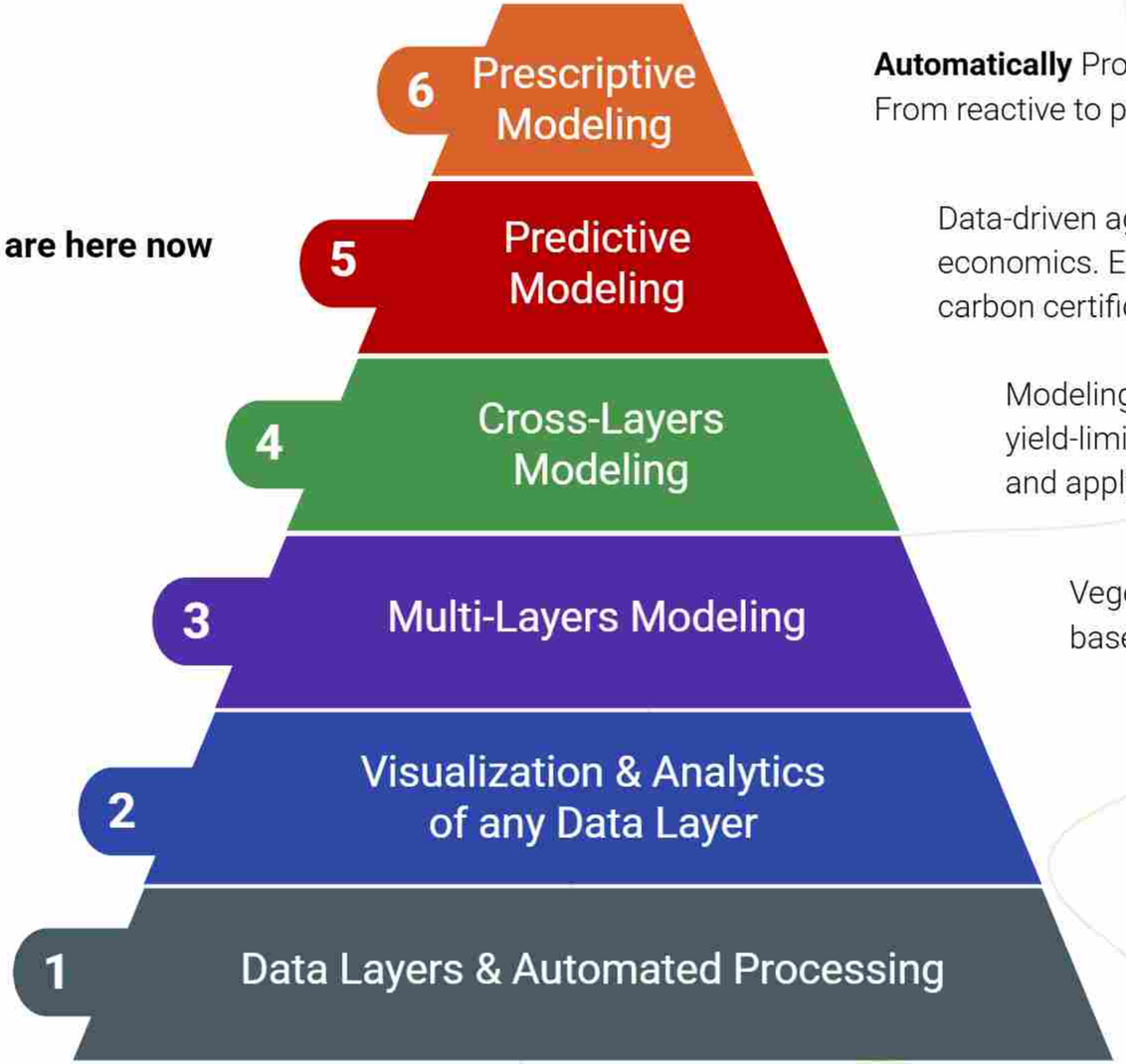
Automated Scouting Tasks

Reduce Field Visits & Fuel Consumption

Read more

Product Vision

We are here now



Automatically Produce foresights & agronomic recommendations. From reactive to proactive pure data-driven decisions.

Data-driven agricultural inputs demand, planning, tracking, ROI and economics. Ex: detect executed agri operations are required for carbon certification verifications.

Modeling based on cross layers dependencies. Understand yield-limiting factors, correlations across various data layers and apply agronomic logic based on these insights.

Vegetation indices, analytics, and field management zones based on multiple data layers. Big data analytics.

Data rendering in human beings and AI acceptable formats. Applied advanced analytics and statistics for every data layer.

Automated processing pipelines including data standardization. Supported data sources: satellite imagery, machinery, soil scanners and sensors, topography.

GeoPard Agriculture

Thank you!

Dmitry Dementiev, CEO

dmitry.dementiev@geopard.tech
+49-176-36322391

geopard.tech