Remote Sensing Solutions for Agriculture

KLEFFMANN Digital RS
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Optimizing agriculture with the power of satellite technology

Kleffmann Digital has evolved from the Kleffmann Group - until 2019 the world's leading company for agricultural market research. Based on thirty years of experience in agricultural research, with its deep understanding and knowledge of agricultural processes and farmers demands, Kleffmann Digital RS uses the power of satellite technology to provide highly innovative solutions for farmers and agribusiness. Among these are the well established and market proven solutions My Data Plant and CropRadar.

CropRadar will support companies to get not only a global overview of the distribution of crop types, but on selected crop cultivars the total number of drilled/planted areas and later surviving harvestable areas can be estimated.

My Data Plant technology offers the possibility to monitor the crop vitality of all farm areas utilizing the perspective of satellite data and to manage crops on a zone by zone level. Variably rate prescription mapping for fertilizer, seeds and crop protection products can be created to enable precision farming applications.

Remote Sensing

By innovations

Based on thirty years of experience in agricultural research, with its deep understanding and knowledge of agricultural processes and farmer's needs, Kleffmann Digital RS provides tailor-made and highly innovative solutions for farmers and agribusiness

Helping develop agriculture

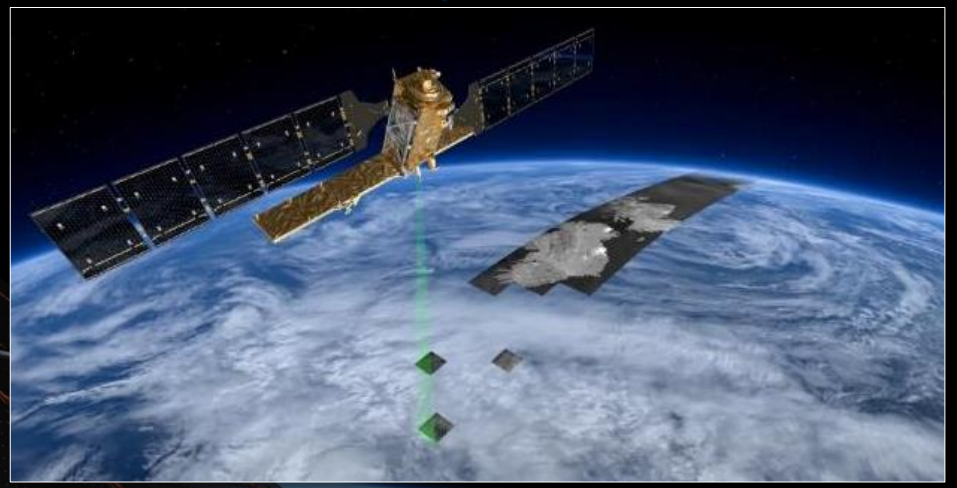
Relying on its well-established satellite- and AI-based products – among others: "My Data Plant" and "CropRadar" – Kleffmann Digital RS is a leading light in resource-efficient and sustainable farming.

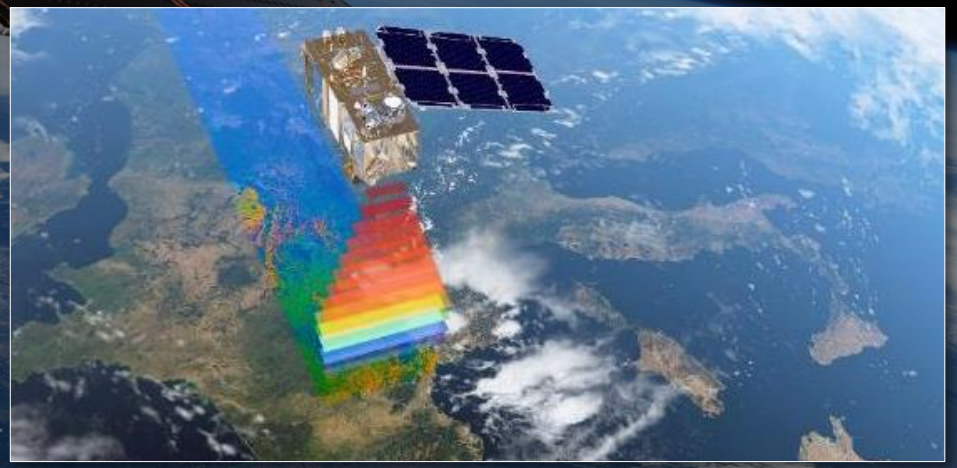
The Sentinel Programme

ESA's Sentinel programme is used for Earth observation and enables the use of radar and multispectral satellite data.

The high-resolution spectral cameras produce Images of the visible, near-wave and short-wave infrared spectrum covering 13 different frequency ranges. These range is from visible blue (440 nanometers) to short-wave infrared (2190 nanometers).

Pictures are updated every 5 days with a resolution of 5 x 5 meters.





Principle of remote sensing

My Data Plant
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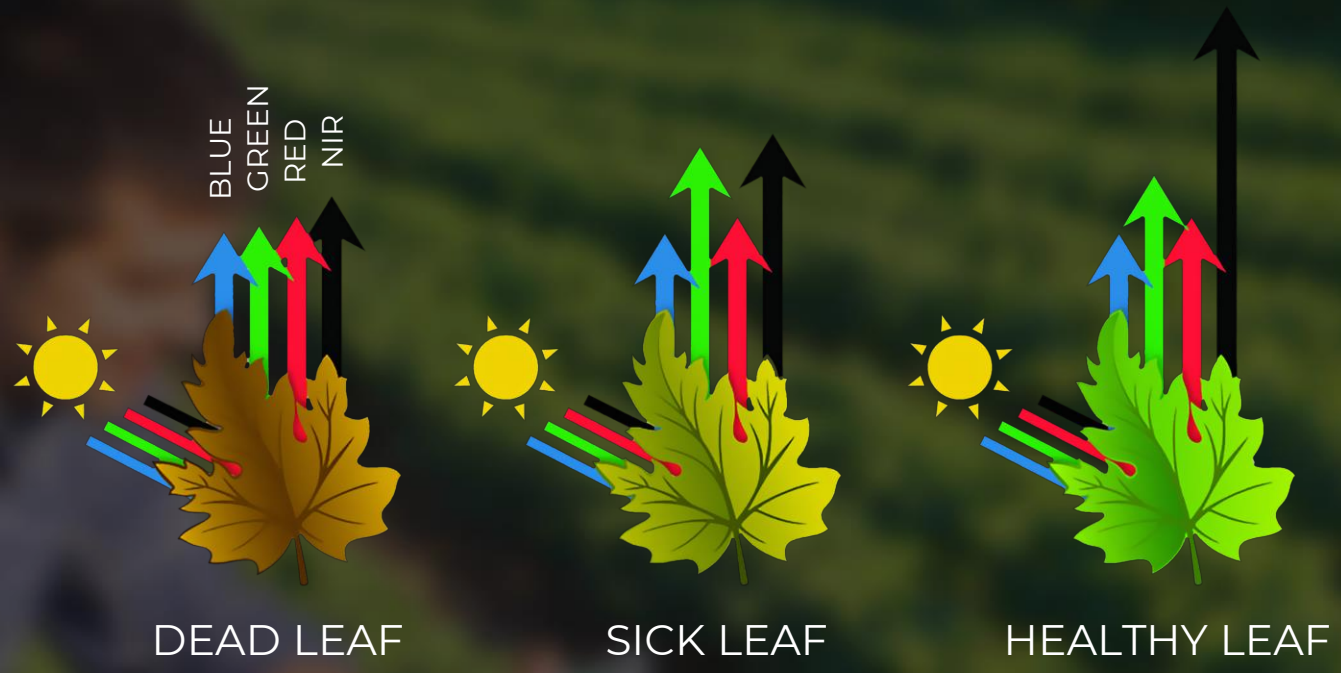
- The reflections of the sun's rays on the object are recorded
- Leaves reflect the light differently according to their condition
- Sensors on board the satellites measure various indicators of plant vitality, such as leaf surface or chlorophyll saturation.



Kleffmann Digital One Process – Three solutions!

My Data Plant
by KleffmannDigital RS

CropRadar
by KleffmannDigital RS

APIServ
by KleffmannDigital RS

ALGORITHMS

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SATELLITE DATA

ANALYSIS

AI
Machine Learning

Data Analysis

International network

30 years of ag experience

My Data Plant

My Data Plant is a precision farming-tool, based on processed satellite data, for those involved in the agronomy of crops allowing them to regularly monitor and analyse their crops biomass development.

Precision Farming technology offers the possibility to monitor the crop vitality of all farm areas utilising the perspective of satellite data and to manage crops on a field by field level. Variably rate prescription mapping for fertilizer, seeds and crop protection products can be created to enable precision farming applications. Thereby optimising resources by adapting inputs to the different ground/growing conditions of the respective areas of a field.

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My Data Plant by KleffmannDigital[RS]

Current status – My Data Plant by KleffmannDigital

My Data Plant by KleffmannDigital

FEATURES

Official launch Nov 2017

Crop type recognition

Yield prediction

Field bench-marking

Infestation risk prediction

2016 | **2020** | **FUTURE**

MODULES

- Biomass
- Fertilising
- Seed
- Crop Protection
- Harvest + Risk
- Irrigation

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Application maps

My Data Plant
by KleffmannDigital

Harvest & Risk (2020)

Crop protection maps

Fertiliser maps

Seed maps

Biomass maps

Biomass maps

- Biomass maps show crop differences within the fields:
  - Green zones mark a strong crop
  - Reddish a weaker crop
- Identification of high and low yield zones
- Showing dry damage or oversupply of water
- Analysis of the consequences of soil compaction, leaching and shadow

Seed maps

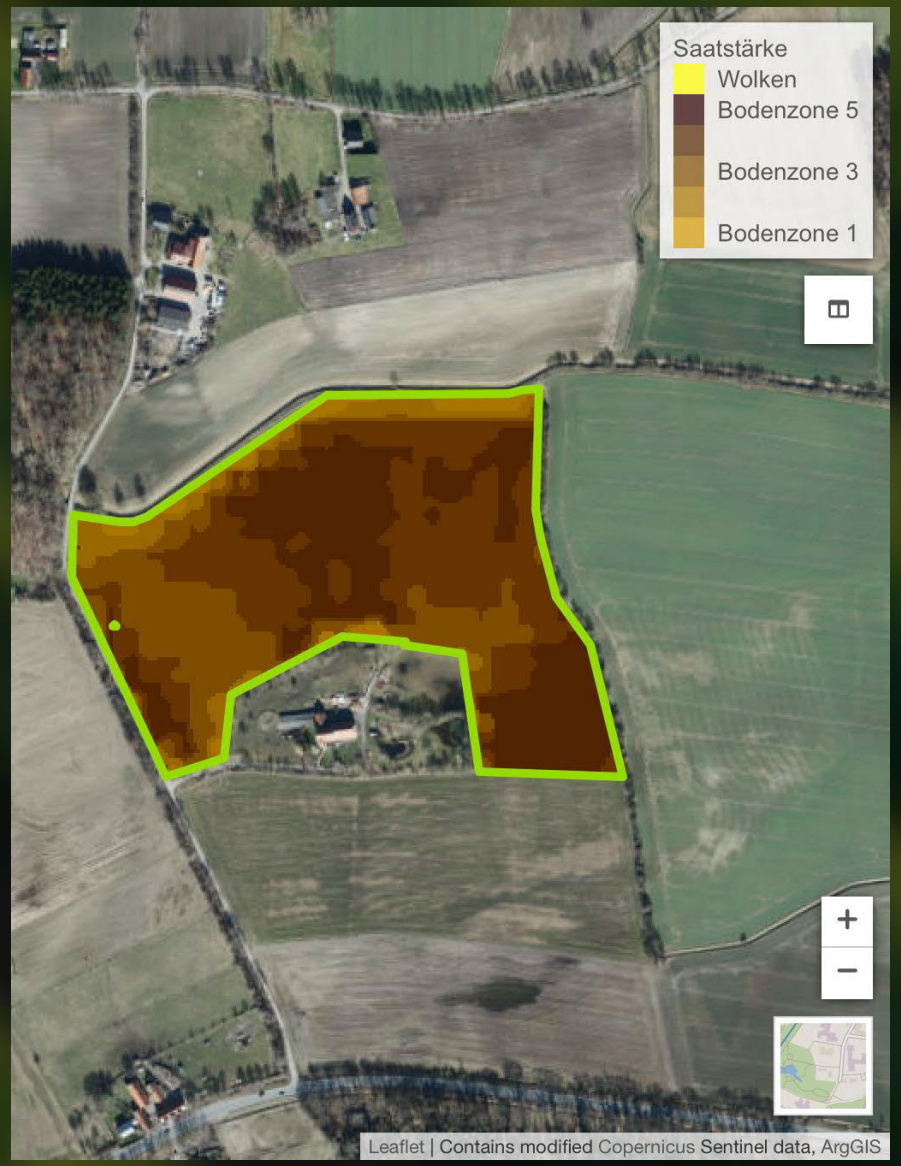
My Data Plant
by KleffmannDigital

- The seed maps can be used to adapt the amount of seed to local soil differences.
- Soil zones based on different soil chracteristics:

  - e.g. Soil type, structure, nFK, soil compaction

→ The yield potential is optimised - on every square metre of the field!

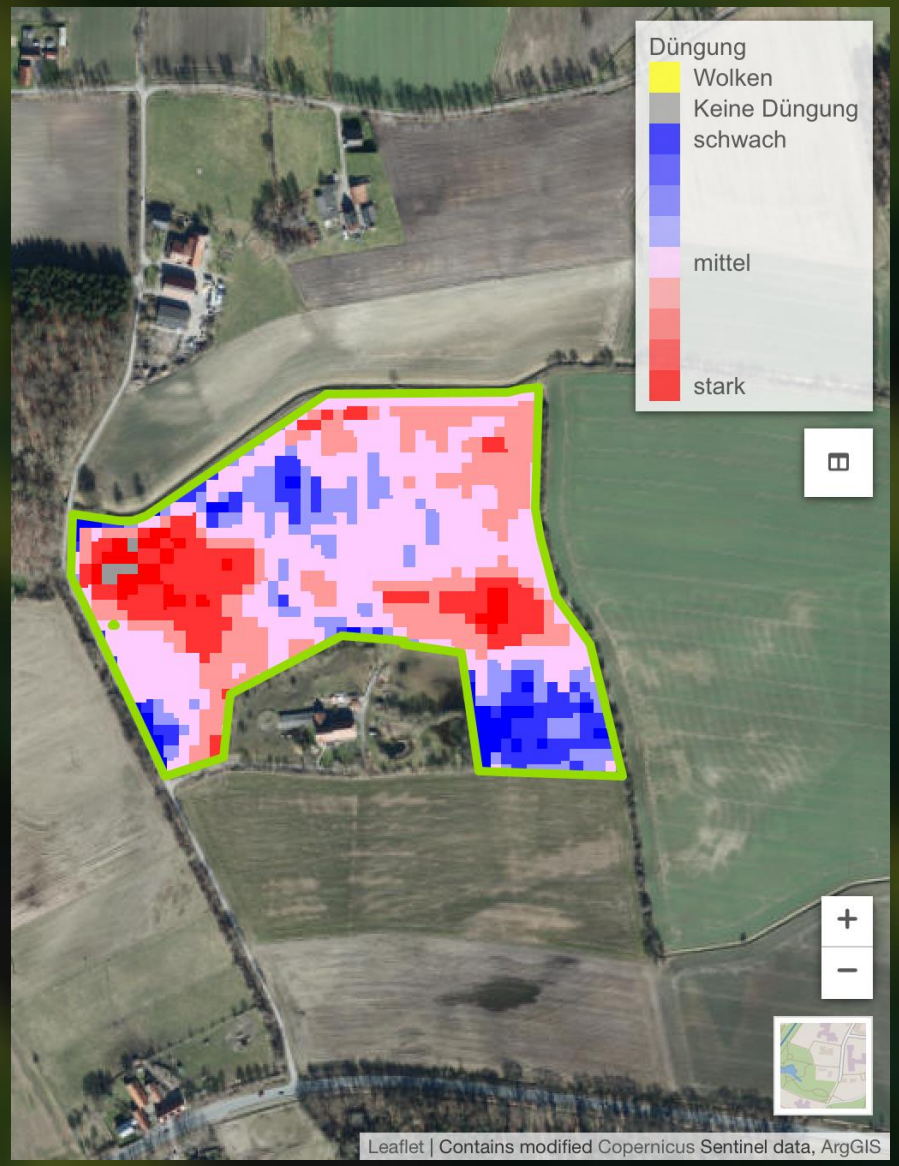
→ Increase yield



Fertiliser maps

My Data Plant
by KleffmannDigital

- Fertiliser maps give recommendations in which zones of the field fertiliser is saved and in which more is needed.
- This is measured by the current status of the crop.
  - → Improvement of the N-Balance
  - → More efficient use of fertiliser
  - → Increase in harvest quality



Crop protection maps

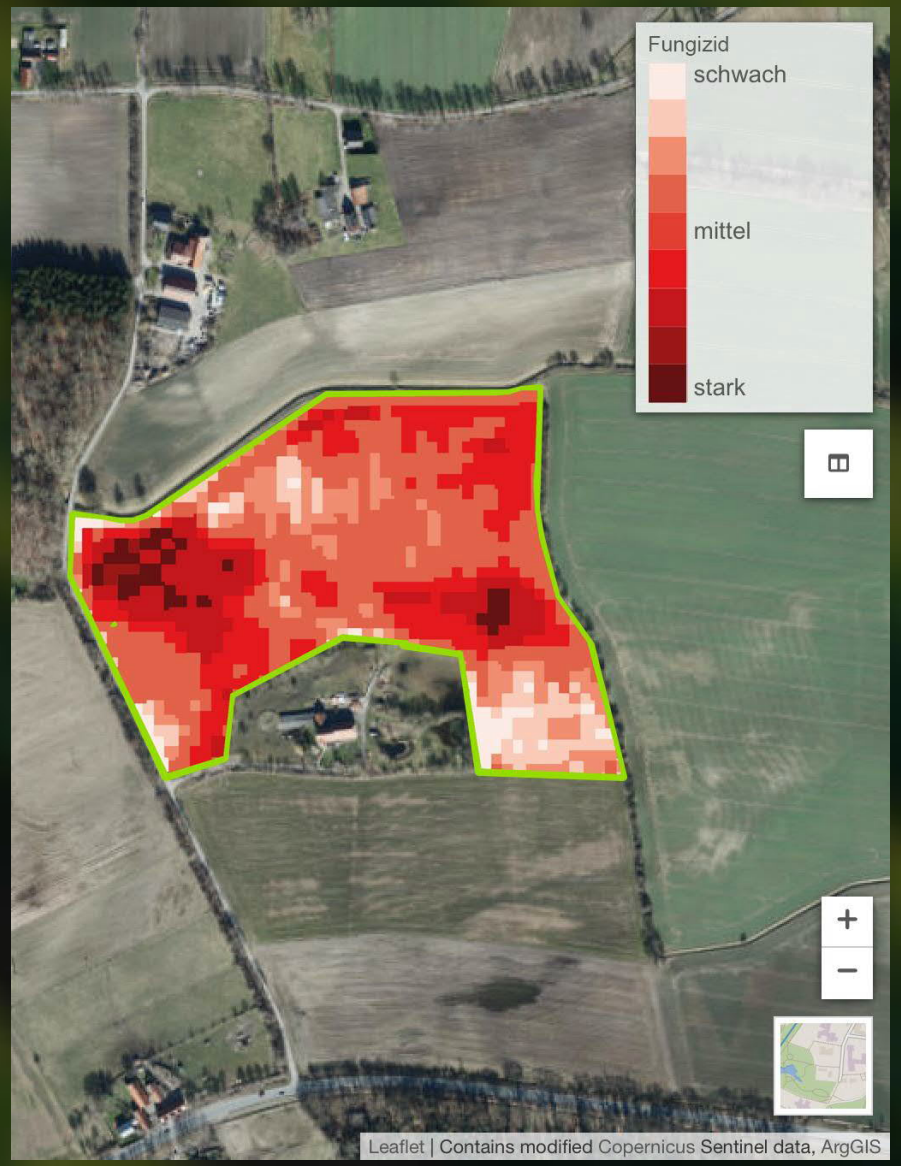
My Data Plant
by KleffmannDigital

- Crop protection maps enable the use of fungicides and growth regulators on the partial area.

→ 5 - 10 % savings on growth regulators and fungicides

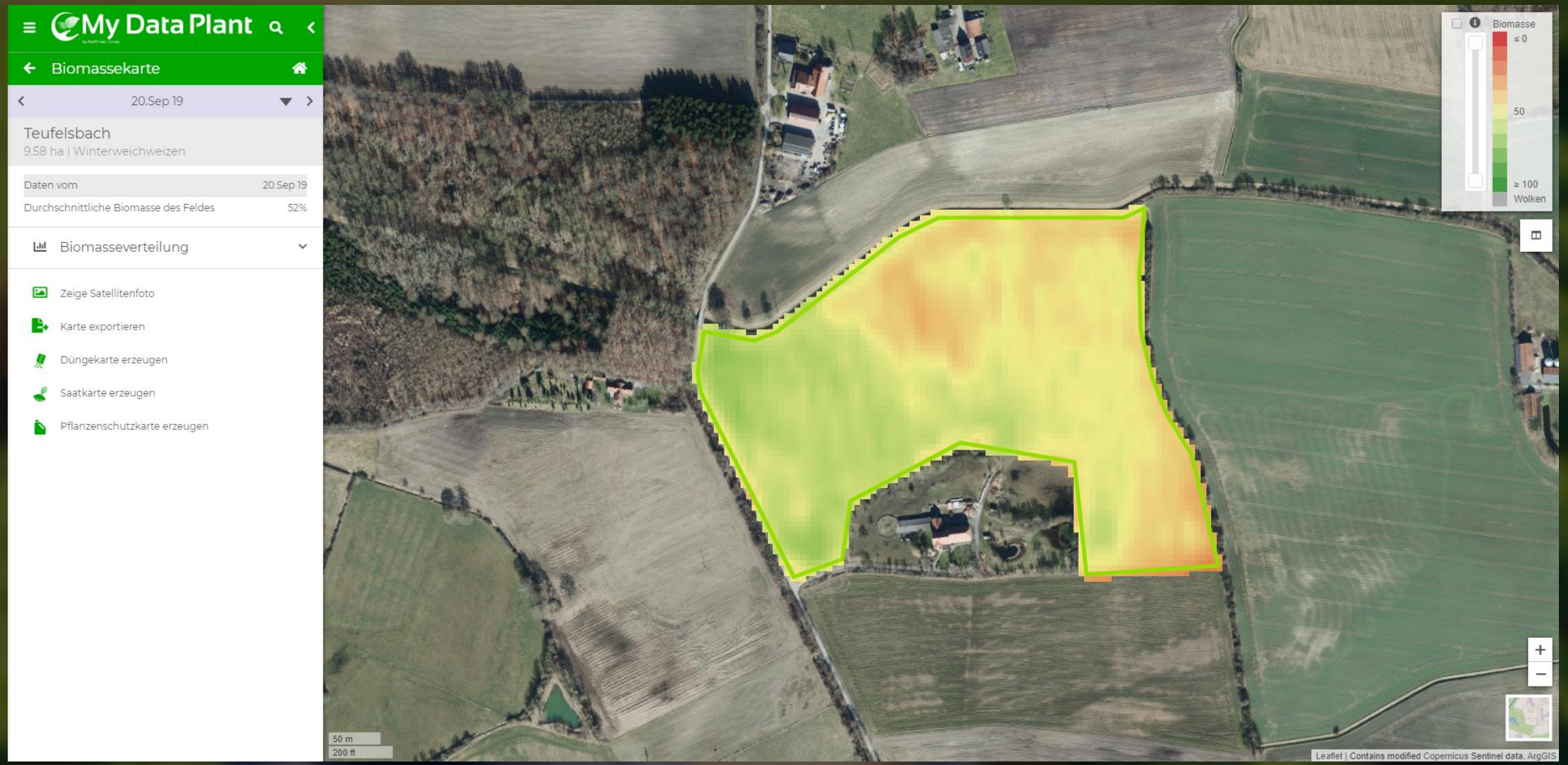
→ 5% increase in yield through optimized use of growth regulators

→ More homogeneous crops



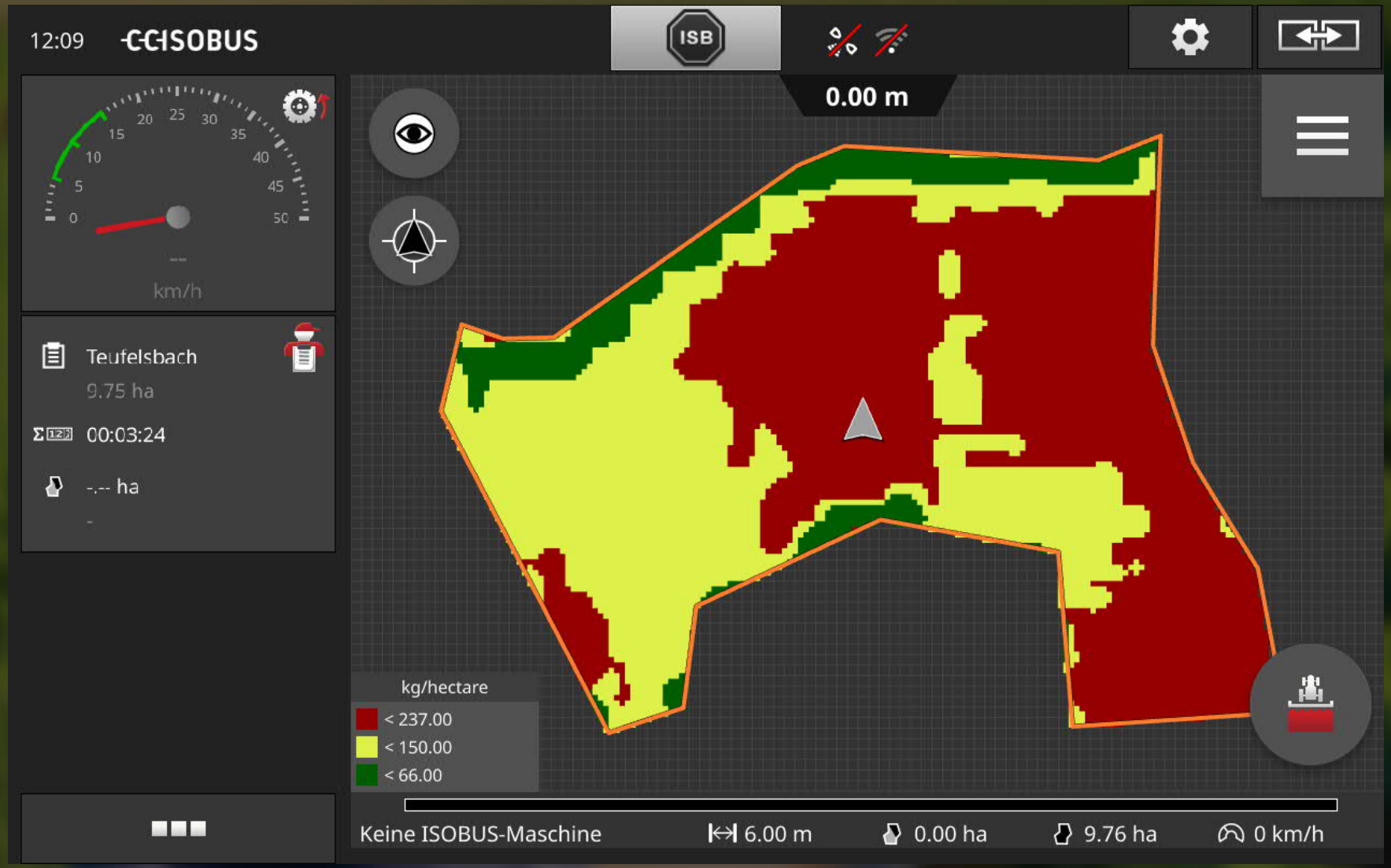
My Data Plant - Portal

My Data Plant
by KleffmannDigital



Terminal view Tractor

My Data Plant
by KleffmannDigital



Benefits of My Data Plant

My Data Plant
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Biomass maps
Crop monitoring and development, time of harvest

Seed maps
3 – 5 % Saving of seeds
7 % More yield through more homogeneous crops

Fertiliser maps
10 – 15 % Saving of fertiliser, Homogeneous crops, compliance with fertiliser regulations, complete documentation

Crop protection maps
5 – 10 % Saving of growth regulators and fungicides
5% Increased yield through optimized use of growth regulators, more homogeneous crops, complete documentation

Harvest & Risk Management
Yield forecast, harvest times, weather, risk and damage analysis

Irrigation module
Using satellite data to make better decision with water management

My Data Plant - Key Facts

My Data Plant
by KleffmannDigital

- 3,000 User
- Global coverage with biomass maps
- International cooperation with different manufactures
- 98% renewal of existing accounts

- Independent provider of satellite data
- Creation of application maps for all measures on the partial area
- User friendly App for mobile devices
- Support of all terminals in the market
- 24/7 full service for My Data Plant and use on the tractor

Crop Radar

Crop Radar is an unrivalled cutting-edge product for accurate crop area estimation which is based on the
AI-interpretation of remote sensing satellite data. CropRadar will support companies to get not only a global overview of the distribution of crop types, but on selected crop cultivars the total number of drilled/planted areas and later surviving harvestable areas can be estimated. It is anticipated that such analysis can be provided with an accuracy of 97 % down to zip-code-level.

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CropRadar
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Crop Radar - External Customer Needs

Crop Radar
by KleffmannDigital

"Has the harvest of OSR already been finished? Which OSR fields were already harvested?"

"Is the cultivated area of sunflower in Ukraine 4.5 mil. or rather 6.3 mil. hectares?"

"Where should I strategically position my sales reps?"

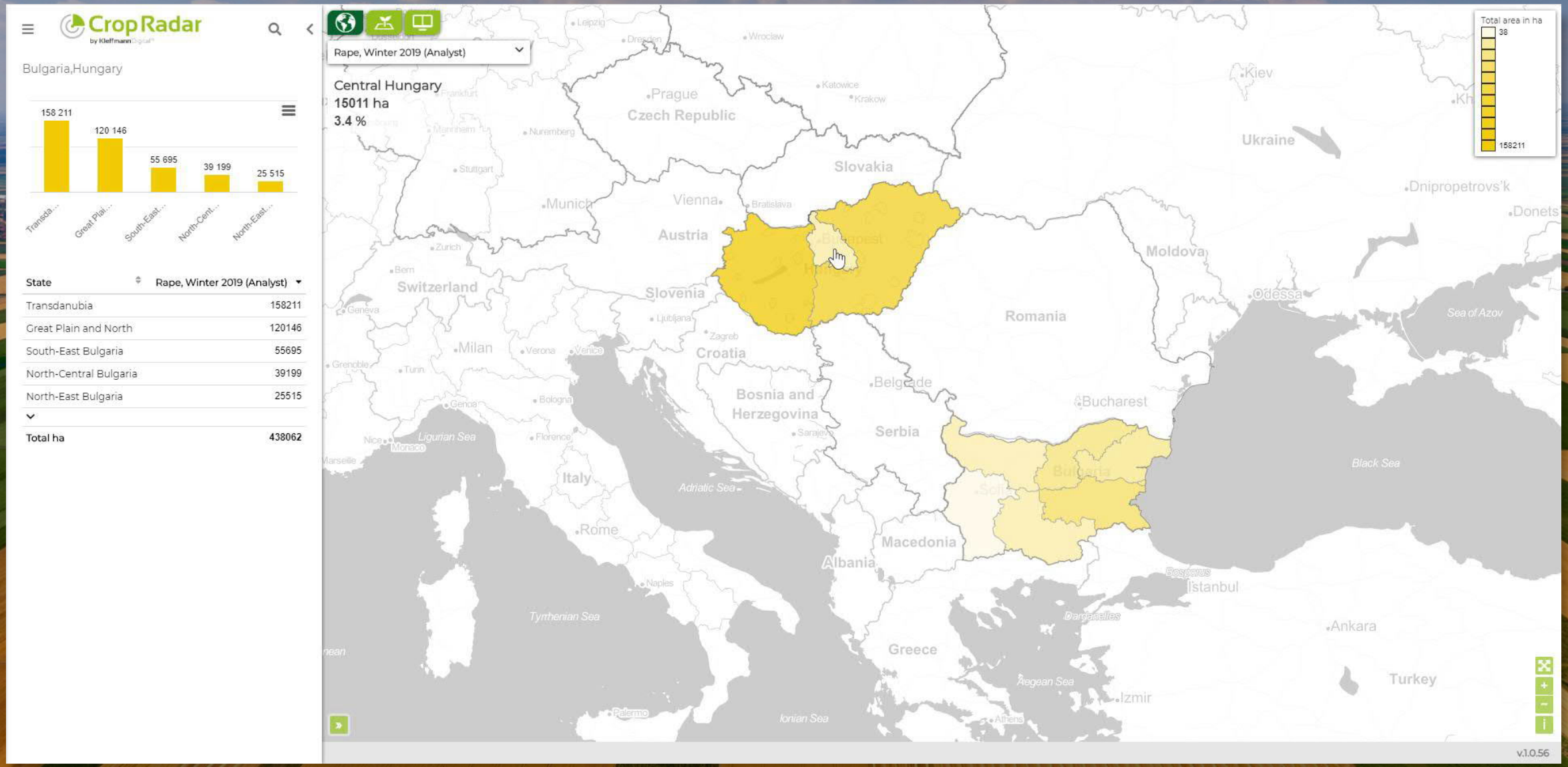
"How much area of OSR was damaged by the storm?"

"What are the effects of the recent flood in Serbia?"

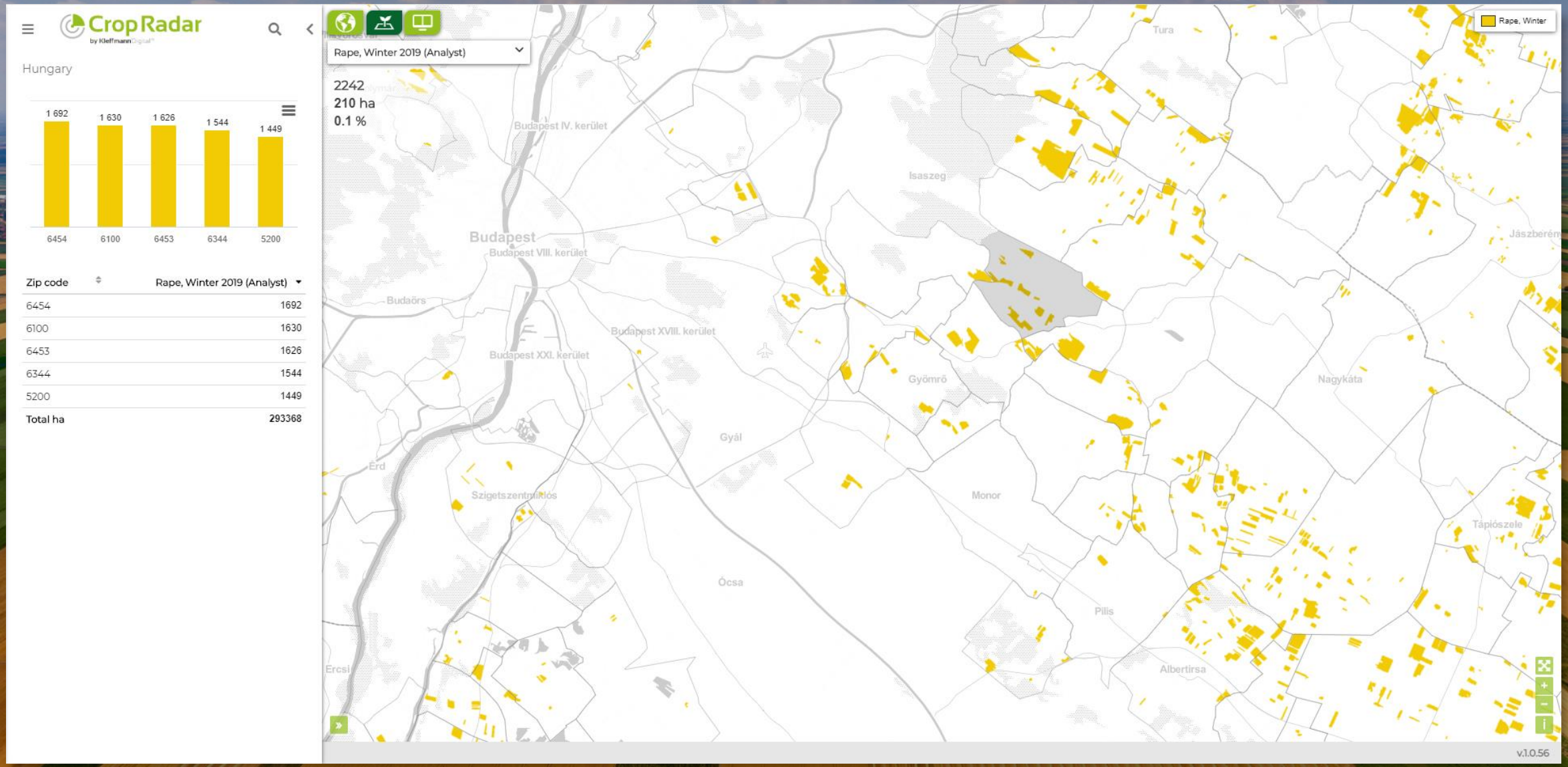
"How big area was damaged by frost during the winter?"

"What is the precise number of cultivated area in Germany?"

Crop Radar Portal



Portal Field View



Current status – CropRadar

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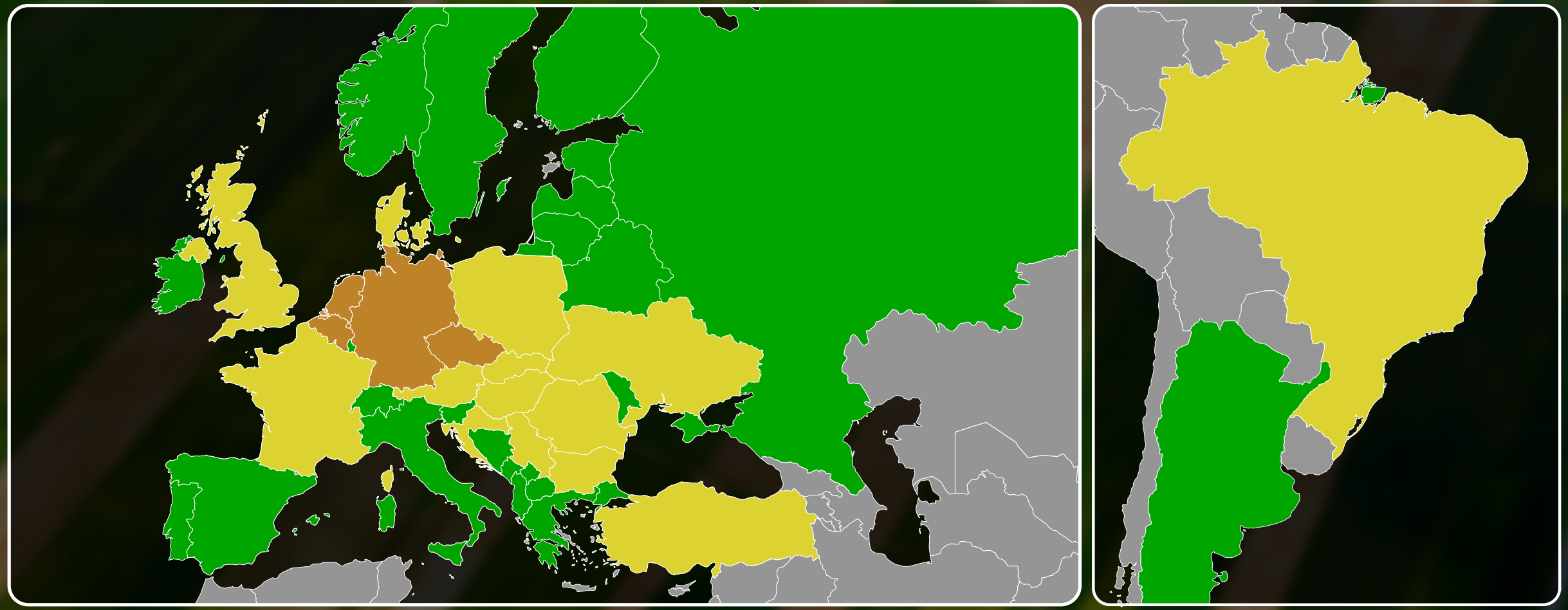

2016	2	Crops	3	Countries	15	Mio. ha
2020	10		18		180	
2021/22	20		36		540	
2024	Global coverage					

Recurring calibration & validation
for each country

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Remote Sensing Solutions for agriculture

Individual Developments & Data Stream Solutions

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Current status – APIServ by KleffmannDigital[RS]