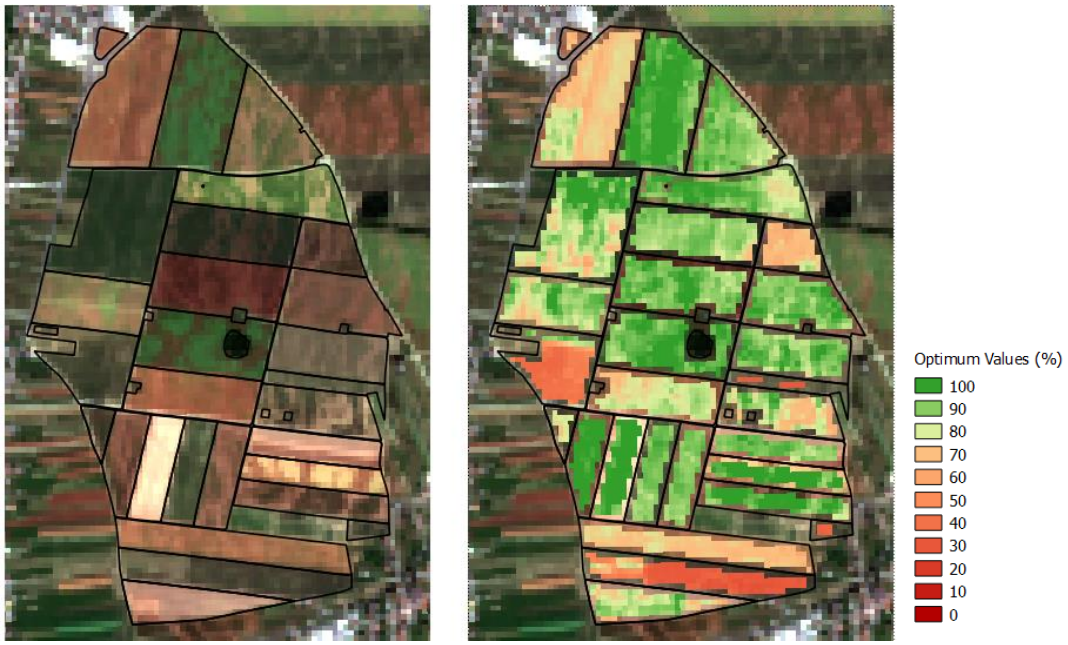
EARLY VEGETATION STRESS



Performance of crop fields (Source: GeoVille)

CATEGORY

☐ Product Development ☐ Product Sales ☒ Underwriting ☒ Loss Adjustment ☐ Claims Handling

DESCRIPTION

This service provides information on vegetation stress based on long time series of optical satellite data. Information on a long-time scale and range of spatial scales can be derived. Vegetation trend observation can be a helpful tool of where to focus further investigations, potentially as the basis for possible interventions.

Vegetation stress is derived based on different methodologies. Most of them use vegetation indices such as the Normalized Differenced Vegetation Index (NDVI), Leaf Area Index (LAI) or Fraction of Absorbed Photosynthetically Active Radiation (FAPAR).

A long and consistent time series of satellite data is required to separate short term from long term vegetation stress. Additional data such as meteorological data is furthermore needed to distinguish between weather-induced short-term changes and long-term stress caused by other factors (e.g.: farm management, inputs application, soil specifics, etc.)

PRODUCT SPECIFICATIONS

Main processing steps	Processing is based on long and consistent time series of vegetation indices.
Input data sources	Optical: Sentinel-2 Radar: Sentinel-1 Supporting data: meteorological data
Spatial resolution and coverage	Spatial resolution: 10 – 300 m Coverage: National/regional/local level Availability: globally available
Accuracy / constraints	Thematic accuracy: > 85 %, depending on in-situ data availability Spatial accuracy: 1.5 - 2 pixels of input data

Limitations	To disentangle actual stress from normal but e.g. delayed vegetation growth or mismanagement requires not only long time series but also information about natural conditions such as rainfall deficits.
Frequency / timeliness	Frequency: depending on satellite revisit rates Timeliness: near real-time
Delivery / output format	Data type: Raster formats, vector formats File format: GeoTIFF, shapefile
Accessibility	Commercially available on demand from EO service providers.

CHALLENGES ADDRESSED – USE CASE(S)

Underwriting:

- Seasonal portfolio monitoring
- Online platforms or easy-to-use interfaces integrating various data sources (e.g. vegetation stress, field boundary changes, comparison, etc.)
- Actual crop health (vegetation)
- Procure better reinsurance terms/capacity from enhanced insurance practice
- Identification of vegetation stages (identify most sensitive stages when crop is the most vulnerable to a risk, e.g. flowering stage)
- Weather forecast tool

Loss Adjustment:

- Workforce allocation and planning
- Benchmark physical field observations against yield loss detection (e.g. product calibration)
- Increase credibility of loss adjustment (e.g. show EO data/visualization to support loss adjustment communication to farmer)
- Enhance field survey (better precision with EO data support)
- Detect crop damage at field level
- Assess crop damage at field level
- Distinct field heterogeneity with crop damage