Field Boundaries

Field parcels detected in Emmeloord, The Netherlands (Source: GeoVille)

Category

☑	Product Development	☑	Product Sales	☑	Underwriting	☑	Loss Adjustment	☑	Claims Handling

PRODUCT DESCRIPTION

Information on field boundaries is highly important, especially in data sparse regions such as emerging markets. This service identifies agricultural field parcels within a selected area of interest. The detection of field parcels is based on their distinct management histories.
Furthermore, this data can be used as input for other satellite-derived information such as crop type detection, growth monitoring or crop health and more accurate assessment of the area and parts of fields damaged.

PRODUCT SPECIFICATIONS

Main processing steps

Analysis is based on satellite imagery using time-series and growing patterns to delineate the individual field parcels. Image segmentation is performed based on vegetation indices (such as NDVI) to detect differences between neighbouring fields. To ensure better accuracy, the segmentation sensitivity and time-frame selection can be adapted to account for regional differences. More innovative approaches use image recognition techniques for this purpose.

Input data sources

Optical: Sentinel-2, VHR

Radar: Sentinel-1

Supporting data: n.a.

Spatial resolution and coverage

Spatial resolution: field level

Coverage: Regional/national level

Availability: globally available

Accuracy / constraints

Thematic accuracy: > 85 %, within-season retrieval depending on weather conditions

Spatial accuracy: 1.5 - 2 pixels of input data

Limitations

The detection of large fields can be challenging. To account for regional field variances, time-frame selection and segmentation sensitivity can be adapted. The resulting polygons reflect parcel boundaries and may not represent the actual crop production units.

Frequency / timeliness

Frequency: upon request – across growing season, within-season, annual, multi-annual

Timeliness: near real-time

Delivery / output format

Data type: GIS-ready data formats; Vector; API (depending on customer needs)

File format: Shapefile

Accessibility

Commercially available on demand from EO service providers.

CHALLENGES ADDRESSED - USE CASE(S)

Product Development:

- Market analytics
- Index insurance: Risk / crop modelling (Correlation of EO data with in-situ data)
- Index insurance: Platform for crop health products
- Elaboration of crop profile: Field crops, vegetables, horticulture, greenhouses
- Information on crop rotation
- Information on crop (seasonal) calendar
- Radar data (eliminated cloud cover effects)
- Risk exposure (product design and customer communication)

Product Sales:

- Client outreach
- Pre-contractual consulting (show-case risk exposure)
- Landowner identification
- Farm structure / management practice (linking to cadastre)
- Greater acceptance of index covers by farmers
- Regular market penetration review
- Risk alerts

Underwriting:

- Seasonal portfolio monitoring
- Online platforms or easy-to-use interfaces integrating various data sources (e.g. vegetation stress, field boundary changes, comparison, etc.)
- Risk / crop zoning
- Global/Regional production trends (e.g. monitoring specific crop acreages of surrounding regions/countries)
- Identification of productive units
- Regular assessment of risk pricing and product rating
- Crop calendar and practices

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)

Claims Handling:

- Identification of actual damage size (tons (volume) / ha (area / price (yield value))
- Quality control assessment of claims before pay-out
- Fraud detection