

FIELD BOUNDARIES



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

CATEGORY

Product Development Product Sales Underwriting Loss Adjustment Claims Handling

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.
Input data sources	<u>Optical</u> : Sentinel-2, VHR <u>Radar</u> : Sentinel-1 <u>Supporting data</u> : n.a.
Spatial resolution and coverage	<u>Spatial resolution</u> : field level <u>Coverage</u> : Regional/national level <u>Availability</u> : globally available

Accuracy / constraints	<u>Thematic accuracy</u> : > 85 %, within-season retrieval depending on weather conditions <u>Spatial accuracy</u> : 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.
Frequency / timeliness	<u>Frequency</u> : upon request – across growing season, within-season, annual, multi-annual <u>Timeliness</u> : near real-time
Delivery / output format	<u>Data type</u> : GIS-ready data formats; Vector; API (depending on customer needs) <u>File format</u> : 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
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