

T1.5 MAPPING

What is an agricultural map?

The map shows different soil types and their fertility levels, as well as different types of vegetation in an area. This type of information can help farmers to determine where their fields are located and what kind of crops they should plant there based on soil types and fertility levels. A good map should be easy to read and understand. It should also be accurate, detailed, and up-to-date (GeoPard Agriculture, n.d.).

Maps and field mapping in agriculture

Maps have been important assets to farmers throughout history. Landowners and farmers know their fields pretty well, but with the addition of digital maps, agribusinesses gain a competitive advantage by knowing their land accurately based on geodata, not just experience (Intellias, 2019). Field mapping is the process of using GPS technology to map the land. It provides data on fields and crops regarding the cultivated area and their fertility. Field mapping differs from traditional surveying methods, as in this case there is no need for a surveyor, but it is done automatically with the help of cameras and sensors on drones or satellites (GeoPard, n.d.). Agricultural field mapping is an essential part of precision agriculture.

Precision agriculture mapping

Precision agriculture mapping is a subset of GIS (geographic information systems) that uses satellite and aerial imagery to map the location of crops and other agricultural features. This allows farmers to determine which areas they need to pay attention to and apply more fertilizer or irrigate. The latter is crucial, as it reduces costs and at the same time leads to growth in production results. Precision agriculture maps allow monitoring of plant development. On this basis, the amount of fertilizer, as well as water or pesticides, that is needed for a given plot can be estimated. A precision farming map also reveals exactly where the best and worst soil conditions are.

According to Intellias (2019), agribusinesses rely on various types of accurate maps to monitor critical land features on a large scale:

- **Soil zone maps** - allows the soil surface to be monitored, allowing farmers to be aware of harmful irrigation and other soil issues that could threaten their long-term production strategy.
- **GIS and GPS maps** - provide data on crop status, health, soil moisture, and resource quality and quantity. Agribusinesses can use GIS tools and web analytics platforms to forecast crop growth and subsequent agricultural production. Geoinformatics in agriculture relies heavily on custom GIS software solutions or commercial products from global vendors, such as Google Earth Pro.
- **Satellite and drone imagery** - Satellite and drone imagery go together extremely well. The latter allows farmers, for example, to rely on satellite data to prepare fields for heavy rain by predicting weather changes in advance, preventing nutrients and seeds from being washed away. An advantage of drone images is that they are taken at a lower altitude and are therefore not obscured by clouds, as is often the case with satellite observations. Agribusinesses can use

drones to collect accurate images of damaged crops, survey crop conditions, and homogeneity, or spray herbicides with smart agricultural spray technology and others.

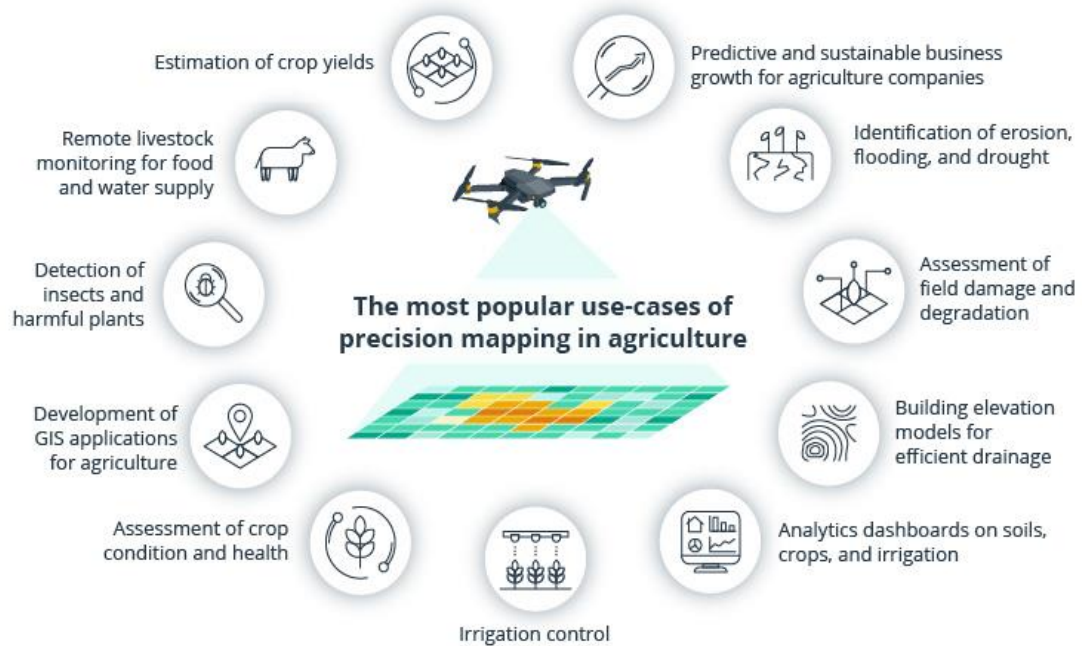


Figure 1: Most popular use-cases of precision mapping in agriculture

Source: <https://intellias.com/how-does-precision-mapping-empower-agribusinesses-to->

- **Crop yield maps** - By combining satellite imagery and GIS data, farmers can intelligently manage crops across seasons and identify yield-limiting factors. These types of precision agriculture maps serve as a visual tool for recognizing correlations between crop yields and field condition indicators.
- **Green vegetation indices (NDVI maps)** - these maps provide farmers with the most accurate and comprehensive measurements of the amount of vegetation in their fields, determine moisture levels, and determine soil health. They can show environmental, social, physical, and other factors affecting crop growth. NDVI appears to be extremely important in increasing income and avoiding many potential problems with flooding and dry soils.

Benefits of precision agriculture mapping

Precision mapping solutions are helping growers to:

- (1) Optimize fertilizer use;
- (2) Improve crop protection;
- (3) Monitor water distribution;
- (4) Increase yields;
- (5) Reduce crop loss;
- (6) Improve safety for workers;
- (7) Improve operational efficiency;
- (8) Minimize risk;
- (9) Increase profitability (GeoPard, n.d.).

Links to relevant topics

GeoPard (n.d.). How to prepare a usable agriculture map?. Retrieved from: <https://geopard.tech/blog/how-to-prepare-a-usable-agriculture-map/>. Accessed on 26.10.2022.



Intellias (2019). How Does Precision Mapping Empower Agribusinesses to Flourish?. Retrieved from: <https://intellias.com/how-does-precision-mapping-empower-agribusinesses-to-flourish/>. November 21, 2019. Accessed on 26.10.2022.

Key words

agricultural field mapping

crop yield maps

GIS and GPS maps

green vegetation indices (NDVI maps)

satellite and drone imagery

soil zone maps



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