SATELLITE-BASED CROP ANALYTICS DRIVING PRODUCTION EFFICIENCY AND FOOD SUSTAINABILITY

EARTH OBSERVATION INSIGHTS ALLOW CROP PROCESSORS TO DIG DEEPER INTO THEIR OPERATIONS TO IMPROVE EFFICIENCY, SUSTAINABILITY AND PROFITABILITY, AND REDUCE COSTS.

Geospatial data analytics can offer crop growers and processors precise, detailed and illuminating data that ultimately optimise food production. Alongside contributing to food security and sustainability, this new technology allows crop farmers and processors to work together in optimising crops from farm to factory.

Crop processors are dealing with increasing competition from international rivals, stringent regulatory requirements and logistics costs that are making it harder to turn a profit. Allied with the wider challenges that feeding a growing world population, climate change and the spread of crop pests, diseases and weeds present, risks and uncertainties for processors and their contract farmers are stacking up.

This is where farm to factory logistics can make a significant impact. Agribusinesses processing the crops farmers produce are in a prime position to optimise both their own and their growers’ sustainability and profitability. Gains can be made in a host of areas, including reducing the proximity of harvested crops to their factory, optimising their planning and factory processes according to harvest timing and crop volume estimates, and helping farmers improve crop health and yield. To do this they need data, and the latest satellite geospatial analytics technology provides it in abundance.
Already, many crop processors assist their farmers with crop rotation planning and crop selection, and offer advice on planting, growing and harvesting to maximise farm yields. At the same time, they use various data to optimise their own production processes, logistics planning and supply chains. For instance, historical crop yield and harvest timing information provide estimates of crop volumes for different times of the year. And crop scouts are often employed to identify potential crop supply risks, such as diseases, pests and lack of nutrients.

Yet these measures neither provide the full global picture, nor up-to-date intelligence in order to make well-informed decisions key to planning, productivity and profitability. For that, processors need the accurate, deep, unbiased complete view that satellite-based geospatial data analytics can provide.

A good example of how geospatial data analytics produces new important insights is time-critical crops, such as sugar beet, barley and oats, where minimising the time it takes from farm to factory is crucial to avoid spoiling. Earth observations of all fields in the factory catchment can be paired with road maps to measure the distance from each farm to the factory. Not only can this information be used to rank and prioritise existing contract farms in order to optimise logistics planning, it also offers invaluable insight into which farms to target as new suppliers.

These factory catchment optimisation decisions are made easier by additional insights from Earth observing satellites. For instance, satellite information can offer a complete map of land use with the factory catchment area, both today and in the past. By identifying which crops are being grown on different farms, how crops have been rotated and how each individual field has performed in previous years, processors are armed with a wealth of accurate and independent data. Such data can be used in negotiations with both existing and potential contract farmers. Combined, these satellite geospatial insights allow processors to shift production closer to their factories, thereby increasing commercial efficiency and reducing the risk of crop spoiling.
Beyond optimising farm to factory distance, satellite data analytics yields a wealth of in-season monitoring solutions that benefit both farmers and processors. Earth observation can identify and differentiate crops early in the growing season to calculate acreage used for cultivation. This offers processors a first precise, independent and scientifically sound assessment of potential crop production volumes – key information enabling them to plan and budget transportation, resources and inventory management.

Furthermore, by analysing the real conditions of the fields – incorporating satellite, weather, soil and farming practice data – processors can estimate harvesting time early. Information like this is useful for farmers keen to minimise crop storage and losses by employing a ‘just-in-time harvesting’ strategy, whereby crops with the poorest yield potential are harvested first, and better crops left for later lifting. At the same time, processors can gauge supply and demand, helping them optimise factory resources and thereby save on costs.

Alongside a host of other uses for these data – such as water stress monitoring for irrigation planning, and ensuring farms comply with processor guidelines on crop management – the data can be further interrogated to understand the health of individual fields and how farms are performing.

Acting as an early-warning alert for farmers, anomalies are identified that indicate stress from disease, pests, water volume, lack of nutrients or impact of weather that could lead to reduced yields. At the same time, frequent crop health alerts allow processors to assess whether fields are performing well or poorly, and estimate spikes in volume and plan accordingly. They also offer key information for further ground-based investigations, so that managers can prioritise scouting, testing and other field operations.

All of these functions serve to make accurately forecasting and optimising crop yields easier. For crop processors, this leads to stronger relationships with their farmers, and more efficient and sustainable operations that result in cost savings and higher profits. And more broadly, satellite data analytics reduces needless food losses, makes it easier to mitigate food shortages, and most importantly helps ensure food security and sustainability.
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