



Paraguay SMART Farm Project

Adapting Origin Digital's Contour Platform to the South American Climate

Agri-EPI Centre has been leading the Innovate UK-supported SMART Farm project in Paraguay since January 2018. It has involved partnering with a farming business to demonstrate UK agri-tech in the agricultural economy of Paraguay.

The farming business, GVASA in San Pedro, spans 85,000 hectares and incorporates cattle, maize, soybean and rice production enterprises. This phase of the SMART Farm project has focused on implementing Origin Digital's Contour platform across GVASA's arable fields, providing the farmer with in-depth soil health information, effective crop growth models, and enabling variable rate application.

The economic outcome of introducing UK technology means more profitable farming systems, reduced environmental footprint and improved economic sustainability.

Origin Digital produces digital tools for the agricultural industry, and has undertaken several research and development projects – leading to exciting remote sensing technology.

Its most recent project stands to benefit the whole food chain, from farmers to retailers and government to corporations across South America.

Origin uses radar and optical satellites, as well as weather information, to capture data and marry that with customer statistics to produce growth models, which can be used at both corporate and farm level. This data will help businesses to make informed decisions on cropping, yield predictions and maximising outputs.

Growth models have been produced for both plant growth and climate, specifically looking at soya and maize. These growth models can be applied to any country with a similar climate.

This is all encompassed into a precision tool, Contour. It enables farmers and advisers to improve input efficiencies, save money and increase yields by creating a management plan for each field. Growers can spot issues early, apply the right products in the right places and in the right amounts.



The project

The primary objective of the project was to demonstrate that soil zoning and sampling could be carried out remotely using Origin Digital technology. The second objective was to test the effectiveness of crop growth models, developed in Africa, on farms in South America.

Contour uses remote sensing technology to build a picture of what's happening on the ground – from the soil through to crop growth and harvesting.

Origin has worked collaboratively with Agri-Epi and Innovate UK to gather information on 6927 hectares of field boundaries and cropping information in Paraguay. Management zones were created over 1,661 of these hectares using soil brightness technology, and 589.6 had precision zonal sampling done on them for nutrient analysis.

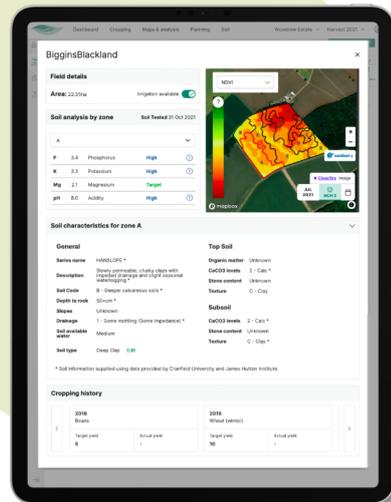
Using crop growth model rulesets developed for Africa, the team were able to deploy these models in Paraguay with high levels of accuracy. Minor localisation of the models further increased the accuracy confirming the localisable value. These models include crop growth stage and yield predictors.

A particularly useful outcome is variable rate fertiliser recommendations, which can lead to significant cost savings, increased soil health, and improved efficiencies, yield and profitability.

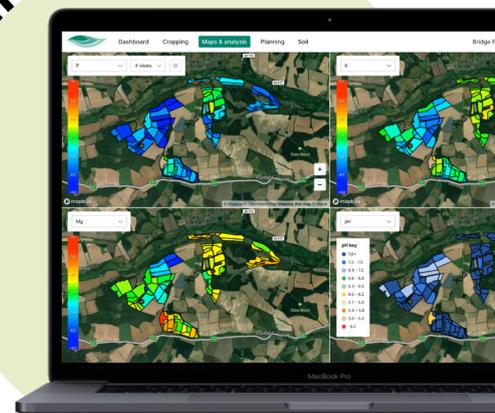
Nutrient planning



Field data



Soil analysis



Scaling the data

AgSpace evaluated the growth models developed in Africa for a South American environment. And the satellite imagery provided farmers with the ability to plan, target and predict weaker areas of their fields. The growing seasons are similar; generally the summer and winter crops are planted at the same time, and local weather is also comparable.

Recording crop growth data remotely is a very powerful tool for the entire farming ecosystem.



Data

Local weather data



Satellite imagery



Soil variability mapping



Yield maps



Soil analysis



Cropping & observation data



Benefits

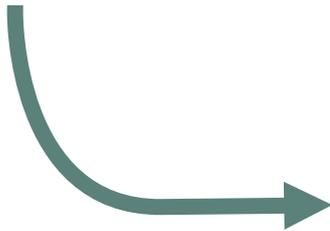
- Risk modelling
- Benchmarking
- Real time information
- Food security
- Sustainability
- Maximise efficiencies
- Minimise inputs, maximise profitability
- Accurate forecasting

With advancements in remote sensing and agricultural technology over the past decade, it will clearly play a vital role in food security in the future. The ability of remote sensing data to predict and alert farmers about issues at soil and crop level – which farmers can then tackle – through to forecasting crop failure for governments and corporations, is valuable.

Although remote sensing can never replace the tools on the ground, it can assist in providing accurate and reliable tools throughout farming, as resources continue to deplete.

Results

The **African models** ● showed a strong correlation with **actual South American yields** ●, says Dan Wood at Origin Digital. “And accuracy improved further when **adjustments were made to the models to begin localising them further to South America** ●, showing that our crop growth models can be successfully deployed in this geography.”



Agri-EPI Centre

Agri-EPI aims to support innovative solutions to help farmers and businesses within the agricultural supply chain become more sustainable and profitable. The Agri-EPI Centre is one of four Agri-Tech Centres that help to bridge the gap between the industry and academia – not only in the UK but globally. Agri-EPI works to develop international links to establish key industry partnerships and relationships as well as supporting projects in technical expertise, grant and project management.

“It has been a pleasure to manage the Paraguay SMART Farm project, particularly facilitating Origin Digital's successful adaption of the Contour platform to the South American climate,” says Emily Laskin, farms technical coordinator at Agri-EPI.

“Seeing British technology provide efficiency and sustainability benefits to farming practices internationally shows us how we can make a difference and is a source of pride for the entire team at Agri-EPI.”

Soya yields compared to predicted and "adjusted" yields, by farm field

