



FOOD AND AGRICULTURE · PLANNING & FORECASTING

Soil Nutrient Levels Prediction

A major GCC agriculture company used Quantum One to forecast soil nutrients and cut fertilizer spend — an EBITDA uplift of 1.6–3.1%.

IMPACT

+1.6–3.1%

EBITDA uplift from precise real-time nutrient forecasting and less manual sampling

~15%

Error of the top-performing model forecasting nitrogen, phosphorus and potassium

100 × 100 m

Area for which nutrient levels are predicted from limited soil samples

CLIENT PROFILE

CLIENT

A major GCC agriculture company with worldwide farming operations

REGION

GCC, global operations

SCENARIO

Planning & forecasting

INDUSTRY

Food and Agriculture

COMPANY TYPE

Agribusiness

CHALLENGES

- A major agribusiness with large-scale farming operations set out to reduce fertilizer costs and optimize usage.
- It wanted a better soil nutrient balance for higher yields, and to replace manual, vendor-dependent nutrient forecasting.

APPROACH

An AI model forecasts soil nutrient levels — nitrogen, phosphorus and potassium — in real time to roughly 15% error, combining historical soil samples, weather data and agronomic inputs.

Outlier detection cleans inconsistent measurements, and the outputs are delivered as prescription maps for optimal fertilizer dosage per hectare.

BENEFITS

- Automated cleaning of nutrient sampling data with AI outlier removal
- Real-time forecasts of N, P and K at one-hectare granularity
- Integration with agronomic decision systems to generate prescription maps
- Higher precision than third-party black-box tools

TIME TO PRODUCTION

Stage	Quantum One	Typical process	
Problem definition	1 week	2–3 weeks	
Proof of concept	2–3 weeks	4–6 weeks	
MVP	4–6 weeks	8–12 weeks	
Scale-up	1–2 months	3–4 months	
Maintenance	Ongoing	—	

TAKE THE NEXT STEP

Speak with our experts to discuss tailored AI solutions for your industry

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