

Greenhouse Grower Improves Yield Predictions Through Accurate Forecasting

This greenhouse grower faced challenges with outdated forecasting methods, struggling with inaccuracies and data inconsistencies in crop yield forecasts. Seeking to enhance their predictive capabilities, they turned to Wavicle for advanced analytics expertise and the company's proprietary forecasting accelerator to quickly build, test, and deploy complex yield forecasting models.

The grower needed a state-of-the-art forecasting environment that would deliver precise yield predictions to help them improve decision-making and optimize margins. Using Wavicle's forecasting accelerator, a solution was created on a rapid timeline that surpassed existing methods in reliability and accuracy, setting a new standard for agricultural forecasting at the company.

Forecasting challenges hinder proactive decision-making

This leading greenhouse grower sought a better way to predict crop yield. Historically, the company used a pre-built forecasting software to predict yield, which was unreliable and lacked transparency. Decision-making was compromised because manual inputs and a lack of version tracking undermined trust in the accuracy of the results.

The company encountered significant challenges in quantifying the accuracy of their forecasts because, while an error metric was in place, it failed to effectively measure forecast performance. Additionally, a lack of versioning allowed forecasts to be overwritten at any time, making it difficult to track changes and identify what data was used for past decisions.

With unreliable forecasts, stakeholders did not have the information necessary for future planning. When production fell short of expectations, the company was forced to find alternative suppliers on short notice to cover the shortfall, often at a higher cost. In contrast, overproduction decreased the company's margins. This highlighted the urgent need for a more dependable forecasting system to enable proactive decision-making and optimize the company's supply chain.

Wavicle collaborated with the greenhouse grower to develop a new, comprehensive proof of concept (POC) yield forecasting system that includes versioning and a transparent error metric in order to forecast yield more accurately, improve decision-making, and enable a smoother supply chain.

A strategic approach to yield forecasting

Wavicle's experts built a yield forecasting POC to improve forecast reliability to support long-term financial planning and align short-term crop supply with committed delivery quantities. The POC aimed to enhance forecast accuracy and operational efficiency for the company, focusing on forecasts for approximately 20 specific crops across 12 farms. The project resulted in close to 50 different forecasting models, tailored to individual crop and farm combinations.

Developing the POC included the following steps:

- Data examination: Explored and analyzed data, met with subject matter experts to understand key fields, and flagged data errors in order to build a foundation for forecast model development
- Crop mapping: Connected yield data with acreage figures and baseline forecasts to map crop categories and data sources for all crops and farms included in the POC
- Baseline forecast creation: Adapted existing forecasts for direct comparison with model predictions
- Data processing: Corrected data entry errors and prepared acreage and weather data for model integration
- Model building: Fitted six model types for each supplier/crop and built models to evaluate based on 2023 yield data
- Model Evaluation: Compared the forecasts from the POC models with the baseline forecasts, assessed the impact of weather and acreage, and selected the best-performing models through a champion/challenger method

Wavicle's forecasting accelerator played a critical role in building and testing model types for each supplier and crop combination, enabling data scientists to build and iterate on models rapidly. The models underwent hyperparameter tuning to find the best configurations without needing new code development, saving significant time.

This process used Azure Machine Learning Studio for developing and executing the models, Azure buckets for data storage, and Power BI dashboards for visualizing results. Top-performing models were named champions, while other models were designated challengers and could be promoted to champions based on performance.

This structured and thorough approach ensured that the POC effectively demonstrated the potential of Wavicle's forecasting solution to improve forecast accuracy and operational efficiency, addressing the key challenges faced by the company with their existing system.

The impact of a modern forecasting solution

Wavicle's POC successfully delivered a solution that is expected to significantly improve the greenhouse grower's forecast accuracy. **The model achieved a 13% boost in absolute accuracy and a 38% relative improvement over baseline forecasts, with 76% of supplier/crop combinations showing better accuracy using the new models.**

The solution will optimize stock levels, helping the company improve margins by avoiding the need to purchase additional supply at a premium price and minimizing excess inventory. These enhancements will contribute to stronger supplier relationships, enabling the company to consistently meet demand.

The improved forecasting system has the potential to enhance long-term financial planning by offering a critical 12-month forecast and providing the company with insights to manage short-term production fluctuations effectively.

Overall, the greenhouse grower has gained a reliable forecasting solution with the potential to boost strategic planning and margins, laying a solid foundation for data-driven decisions and future growth.

Get in touch



✉ info@wavicledata.com

🌐 www.wavicledata.com



Wavicle is proud to be a nationally certified minority-owned business.