



Empowering farmers and improving crop production

Highlights

- Provide digital data points for accurate and timely decision-making.
- Bring simplicity & transparency to farm management processes.
- Help in making the right decisions, at the right time.
- Ensure effective use of manpower.
- Support sustainable farming.



Need for Innovation in Agriculture

The agriculture and crop science company develops new seed hybrids and varieties that can increase crop yield for farmers. The seed development process requires performing seed trials, testing, and analysis in different fields across geographies and seasons. During these trials, thousands of seeds need to be planted and the growth of the emerging plants need to be monitored to select the best performing seed candidates for development. Manually assessing the physical traits (phenotypes) of the plants, such as emergence, vigor, uniformity over a growing cycle is a time-consuming process which lacks accuracy and transparency. The company needed a faster, digital, and accurate method of plant phenotyping to streamline field operations and downstream decision-making.

Client

A leading agriculture & crop science company

Industry Agriculture

Field Operation Needs	Challenges in Manual Methods of Data Collection
Precise measurement of field area and field isolation distances in critical to estimate output and reduce possibility of cross-pollination.	Measurement of field area and field isolation distances performed manually with GPS devices delivers can result in errors of up to 10 meters.
Emerging plant stand count is needed to compare performance between different seed hybrid varieties, and for estimating yield during seed production.	Performing stand counts by walking through a field is a hugely time-consuming task. Typically, sample measurements are taken in a small area and extrapolated over farm plots which gives inaccurate results.
Uniformity of plant growth and plant height is critical to compare the performance between different seed hybrid varieties.	Understanding the uniformity of a field is difficult without the right technology.
During seed production, detasseling is performed manually to prevent self-pollination and improve seed hybrid quality.	No effective and transparent way to verify 100% detasseling of plants to achieve optimum yield.





Asteria's Role

The agriculture and crop science company reached out to Asteria with the goal of exploring how drone imagery can simplify field operations for their seed development and seed production activities. It needed to have access to near real-time farm and crop imagery and analytics to make the right decisions, at the right time. Asteria, with in-house drones, pan-India drone operations teams, and endto-end cloud platform SkyDeck, were put to work to bring more transparency and efficiency to seed trials and seed production operations by turning aerial data into actionable intelligence. Drones were flown over each farm plot, two to three times in a growing season to collect imagery. The images were then processed by Asteria and analysed using AI/ML algorithms to generate desired business outputs.

Technology at Work

DGCA Type Certified A200 Drone

FLIGHT ALTITUDE 25 meters above ground level

FLIGHT SPEED 2 m/s

SENSOR SONY 36 Megapixel APS-C sensor

GROUND SAMPLING DISTANCE 0.2 cm/Pixel

FLIGHT TIME Less than 20 minutes to cover 1.5 acres of feld



SkyDeck

A cloud-based drone operations platform that facilitates the delivery of drone-as-a-service solutions to enterprises across several industries, including agriculture.

Outputs

- Digitized, ortho-rectified images of all farm plots throughout the growing season visualized on SkyDeck.
- Field boundaries, field area, and field isolation distances with an accuracy of less than 50 cm.
- Report of geo-referenced plant stand counts plot with an accuracy of more than 92%.
- Report of plant uniformity per plot.

- Measure field area & determine and annotate field boundaries on SkyDeck.
- Isolation distance in Excel from Field A to Field B.
- Tassels detected with 99% accuracy and flower bud recognition with 90% accuracy.
- Multispectral maps depicting plant stress level (NDVI, NDRI, SAVI, etc.).

The Impact

Asteria Aerospace helped the agriculture and crop science company make their farming operations faster, more transparent, and more accurate with drone-based aerial data.

Benefits



Faster, data-backed decision-making for field operations



Accurate plot level insights that would be difficult or impossible with other methods



Simplified seed trials by timely deactivation of non-performing hybrids

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Greater transparency and quality assurance in seed hybrid selection process with digital documentation







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DRONE TO INSIGHTS MADE EASY