

AEROVIRONMENT: CHANGING THE LANDSCAPE OF PRECISION AGRICULTURE

BY LISA CHAI, SENIOR RESEARCH ANALYST, ROBO GLOBAL

AeroVironment has been making headlines lately, and for good reason. The recent availability of its Quantix™ VTOL hybrid drone and the AeroVironment Decision Support System™ (AV DSS) marks a key shift for the application of robotics and AI in the area of precision agriculture. At ROBO Global, we've been anticipating the company's trajectory since the company became an index member at the inception of the index in August 2013. Since that time, AeroVironment has delivered a 26% annualized return, up 267% from August 1, 2013 through March 6, 2019. The stock has risen 66% in the past 12 months alone. As a pure-play company focused on the development and manufacturing of data-analytics-driven unmanned drones, we agree that AeroVironment is heading for the skies, and we think momentum will continue.



AeroVironment has a long history of innovation as the leading provider of unmanned aircraft vehicles for defense and commercial applications. While the company is best known for its Ravens and Pumas—its small, unmanned robotics systems for the Department of Defense—AeroVironment has been aggressively pursuing other growth opportunities. Its strong financial position has supported extensive R&D efforts, including its work in precision agriculture—an area that is helping farmers grow healthier crops and increase yields by providing powerful insights into the real-time status of every crop.

The new Quantix™ VTOL hybrid drone is a turnkey technical solution that is unique in the industry. Advanced AI and on-board data analytics support vertical takeoff and forward-flying modes enabled by sensors, as well as integrated RGB cameras that are used to take aerial videos and create orthomosaic maps to capture entire fields. The Quantix offers multispectral sensors, analytics with the most advanced AV DSS platform, and real-time connectivity to a standard tablet. The user simply maps out an area on the tablet and presses 'go'. The drone takes it from there, mapping its own mission and covering the area at a rate of about 400 acres an hour. During its flight, it can identify irrigation inefficiencies, inspect crops for stress, and record issues that require immediate attention. When the mission is complete, the drone simply returns to the take-off site, simultaneously transmitting mission data to the user's mobile tablet and giving farmers immediate data into the status of the crops and the mission. Data can then be uploaded to AeroVironment's cloud-based solution to provide additional information that can help reduce operational costs and, in some cases, protect the livelihood of the farm.

¹ Allied Market Research

WHY QUANTIX VTOL MATTERS

The Quantix VTOL drone is the most advanced system of its kind available to support precision agriculture. Analysts expect the global drone market in the agriculture sector to exceed \$1B by 2024¹, and the global market for agriculture AI to grow by 21.8% (CAGR) over the next five years, reaching \$790M by 2024, up from \$240M in 2019.²

AeroVironment could capture a significant portion of that market by offering powerful drone technologies that are both simple to use and affordable. The new drone offers an advanced data analytics ecosystem that captures field data quickly, and then quantifies that data into “actionable intelligence” in a format that farmers can decipher and act on immediately. Key features that were announced in February were designed to meet the needs of individual growers, precision agriculture service providers, and large-scale farming operations. They include:

- **Variable Rate Layer capability** that gives farmers the ability to target nutrient deficiencies in specific zones rather than generalizing a crop’s needs based on soil testing for a total field. The Quantix gathers nutrient information for each smaller zone, and then enables the farmer to view, download, and import that data into a wide-range of farm management software to prescribe the most appropriate treatment for each zone.
- **Integration with the John Deere Operations Center** that enables farmers to transfer data with a single click of a button.
- **Quick Resolution Imagery** that gives users the option to view and transfer crop data up to 50 times faster when the available internet connection is low or slow—a common reality in many rural farming areas.
- **Availability of its new Plant Count beta program**, a machine learning and computer-vision based solution used to more accurately count the number of plants per acre, as well as provide progress reports on the health of newly planted seedlings.

AeroVironment’s pricing structure is built to attract users from each of its precision agriculture channels, including three unique product packages that range from \$5,500 to \$16,500. This structure allows customers to gain access to the ready-to-fly Quantix hybrid drone and the AV DSS data analytics platform in a package that is most appropriate for their business and their budget.

Precision agriculture is already changing how farmers of every size reduce costs and create new efficiencies. By applying its advanced drone technology to the space, AeroVironment is changing the landscape of precision agriculture and creating the potential for growth for investors with their own eyes on the future of robotics.

To learn more about how robotics and AI are changing the landscape of precision agriculture, see:

[Scared to eat that lettuce? Robots & AI are coming to the rescue](#)

[ROBO Global's 2019 Trends in Robotics & AI](#)

¹ Global Market Insights, April 2017

² 2019-2024 Global Artificial Intelligence (AI) in Agriculture Market Report, February 2019