

Exploring Ag Robotics

“Ag robotics” refers to the application of robots in agriculture, often used to automate slow, repetitive, and dull tasks for farmers. The robots, which are often called “agbots” or “agribots” in this context, are autonomous and can help improve efficiency while reducing reliance on manual labor. Common applications include harvesting, picking, and weed control.

While ag robotics is rife with potential, it’s been met with skepticism by some. Experts have remarked that investors [do not yet understand how important ag robotics is](#), nor do they feel comfortable with it, nor do they know how to make money with it. As with any new technology, there are some early adopters and some who hold out. But several factors within agriculture are moving things closer to ag robotics – namely sensor-based management, high throughput phenotyping, AI, herbicide failures, autonomous auto-steer equipment, and labor shortages.

So, as the agricultural industry moves toward a future in robotics, what does that future hold for cotton production?

What Does Ag Robotics Mean for Cotton?

Cotton companies and their university research partners are still answering this question, but early results are highly encouraging. The vast majority of initial research has focused on harvesting.

According to current practices, cotton must be harvested in 2,000-acre increments using heavy machinery that poses soil compaction risks. With the advent of ag robotics, cotton can be harvested more frequently – as often as 25 times per season – in smaller amounts. This carries a number of advantages: reduced risk and loss from hurricanes, aphids, and whiteflies; preserved fiber quality and reduced weathering; more efficiencies at the gin; and fewer issues with sticky cotton.

By harvesting open bolls frequently throughout the season, all of the cotton plant’s lint is accounted for, and it can provide more uniform fiber properties (which are valuable at the textile mill). It’s much easier to scale using ag robotics, too; current studies employ one robot per 11 acres, rendering expansion much easier.

Contributing to Sustainability

In 2018, Cotton, Incorporated instituted its [10-year sustainability plan for the industry](#), as growers have adopted aggressive goals in areas ranging from [reduction of water consumption](#) and greenhouse gas emissions to increasing land-use efficiency and soil carbons.

While the current use of ag robotics is certainly contributing to land-use efficiency and creating

limiting normal field wear-and-tear and soil compaction by more sporadic harvests, industry insiders believe the effects of robots, coupled with artificial intelligence, will be enormously positive with regard to sustainability. These positive impacts [include further advancement in areas like precision agriculture](#), with greater emphasis on aspects of cotton farming like weed control and fertilizing. The ability to be more precise with bottle chemical application will enable producers to meet several of Cotton, Inc's goals for cotton production in the USA.

Furthermore, ag robotics and AI will power machinery like driverless combines and also deliver even bigger data sets that drive sustainable farming practices for the future.

Exploring the Distant Future

While research has largely focused on the use of ag robotics in cotton harvesting, the robots being studied are multi-functional. For example, some researchers have begun to look into ways of turning the harvester into a weeder. Nobody yet knows the full potential of these versatile, autonomous systems. Some analysts predict a time when these systems could be solar-powered, roaming cotton fields in droves while communicating vital information between each other – maybe even while autonomous planes fly above, searching for ready bolls.

It's fun to consider all the possibilities, but it creates anxiety for some who fear a takeover by "workerless farms." Industry experts insist that these fears are overblown; while "hands-free farms" may become a reality, they will still require a human touch, just not in the form of manual labor. Agronomists, consultants, and other agricultural professionals may see changes in their roles, but they surely won't disappear.

Just as the tractor and the cotton gin once had to prove their value to agriculture, so too does ag robotics. There may be a long and difficult road ahead for this pioneering technology, but it's a challenge that researchers are happy to take on given all its potential.