

AGCO North America Field Demonstrations Confirm Impact of Ideal Planting Practices on Corn Yields

Three years of comparisons using White Planters with Precision Planting tools and technology illustrate how minimizing planting variability improves corn seedling emergence and yields.

Editorial Note: SmartFarmers were included in several Crop Tour locations. [Learn more about SmartFarmers at Commodity Classic - Friday, March 1 ■ 12:30 p.m. - 1:10 p.m. ■ Rm W206A - session information below](#)

Improving Management Zone Accuracy: The Key to Improving Farm Profitability?

SmartFarmers provide soil organic matter, moisture, temperature and other information on the go to enhance planting and nutrient management at a more refined zone level. The session will review agronomic research that began at AGCO in May 2018. Darren Goebel, Agronomist and Director of Agronomy and Farm Solutions, AGCO; Larry Kuster, Seeding and Tillage Product Marketing Specialist, AGCO; Jason Webster, Lead Commercial Agronomist, Precision Planting.

DULUTH, Ga. --Three years of AGCO Crop Tour North America field demonstrations comparing variable placement of corn seed at planting confirms that yields improve when seed spacing, seeding depth and planter unit downforce pressure are optimized for soil and growing conditions. This on-farm demonstration program provided hands-on education to help producers across the Midwest better understand equipment function and improve planting practices.

Dale and Karen Dirksen hosted one of the Crop Tour plots on their farm near Union City, Ohio. The 33-acre plot was planted with their White Planters® 9816VE planter equipped with Precision Planting® tools and technology.

"The hands-on experience and what I learned from the Crop Tour plot are things I'll use in my farming operation for years to come. The data and results from the in-field comparisons showed us little changes can make big differences," Dale says. "The 20|20 and FieldView are easy to use and the planting data will help us in setting up our planter correctly in the future."

From 2016 through 2018, 20 Crop Tour demonstration plots were planted using [White Planters®](#) VE Series planters equipped with vSet® seed metering, vDrive® electronic drive, DeltaForce® automated downforce, plus 20|20® monitoring and data management from Precision Planting. AGCO compared the timing of plant emergence, season-long plant progress and yield due to intentional differences in seeding depth, seed spacing and downforce pressure across the 10-acre plots. Location variability due to soil types, seedbed quality, compaction and tillage practices was also considered.

"Uniform corn emergence is the most critical factor in optimizing corn yields," says Darren Goebel, agronomist and director of global agronomy and farm solutions for AGCO. "At each location, we mapped the intentional planting variations, then evaluated seedling emergence, monitored crop progress, dug roots, and collected yield data to illustrate to growers how ideal planting practices deliver a real return on investment for growers."

Planting into adequate soil moisture is crucial for top yields

The Crop Tour project compared corn plant performance at six planting depths ranging from 1 inch to 3.5 inches. Soil moisture also was noted. The Crop Tour data confirmed that planting into adequate, consistent soil moisture is essential to ensure consistent germination and even emergence. The comparisons also showed that planting into adequate moisture at depths from 1.5 to 3 inches optimized corn yields¹.

Across 16 locations, seed planted 1.5 inches deep yielded an average 14² more bushels per acre than seed planted 1 inch deep. Conversely, when corn was planted 3 inches deep, average yield was 10² bushels per acre higher compared to corn planted 3.5 inches deep. Stand reduction and uneven emergence were observed at the 3.5-inch depth.

It is also important to note university agronomy research shows it is difficult for corn planted less than 1.5 inches deep to establish a vigorous nodal or crown root system. Planting conditions that stunt or restrict early development of the nodule roots impact the entire plant's development.

"When soil moisture is an issue, the data supports making adjustments and planting at least 1.5 inches deep and up to 3 inches deep to be sure seed is in consistent moisture," Goebel explains.

"These demonstrations show how technology allows the producer to monitor planter activity and adjust for soil conditions to achieve more consistent seed depth across an entire field," Goebel says. "Growers who add optional DeltaForce® automatic downforce to their White Planters also see the benefit of minimizing row unit bounce which can effect seed depth and spacing."

Differences in downforce control measured

Across 19 locations, DeltaForce automatic downforce was used to compare ideal gauge wheel downforce to downforce settings that were too heavy and too light. Corn planted using automatic downforce control, which adjusts on the go to field conditions, yielded 16³ bushels per acre more than corn planted with downforce that was too light and 2³ bushels per acre more than corn planted with downforce that was too heavy. On average, planters equipped with DeltaForce improved yield by 9³ bushels per acre.

Other observations from the AGCO Crop Tour comparisons include:

- The need for downforce pressure on gauge wheels varies in different tillage systems and as soil types change within a field.
- Additional downforce is needed as seeding depth increases and planter speeds increase.

- Central-fill planters need more downforce on the wings to maintain adequate gauge-wheel-to-ground contact.

"Traditional spring-type downforce on planters doesn't adjust on the go like the DeltaForce, which is continually measuring ground contact for the proper gauge wheel pressure," Goebel says. "Growers can adjust their air bag systems from the tractor cab, but it's difficult to adjust accurately as conditions vary across a field. These don't offer the convenience of real-time automatic downforce control, which is possible with the hydraulics in DeltaForce."

Seed singulation accuracy adds 5 bushels per acre

In the seed singulation studies, AGCO compared singulation that was 93.3 percent accurate to seed singulation that was 99.6 percent accurate and planted using the vSet and vDrive technology. Across 17 sites, nearly perfect seed singulation produced an average 5-bushel-per-acre³ yield advantage. Goebel points out that data across more than 6,000 acres showed that White Planters 9800VE Series planters equipped with a SpeedTube, which allows planting at up to 10 miles per hour, achieved an average 99.6 percent spacing accuracy.

"There were no yield differences when planting at 5 miles per hour compared to 10 miles per hour," Goebel says. "This is important when planting windows are short due to adverse weather conditions or as farming operations get larger and growers need to plant more acres during the optimal planting window."

New SmartFirmer technology tested in 2018 demonstration fields

In a select number of demonstration fields, the new SmartFirmer[®] seed firmer from Precision Planting was used. SmartFirmer uses sensors in the seed furrow to continuously measure and map organic matter, soil moisture, soil temperature, CEC (cation exchange capacity) and crop residue so growers can adjust factors like planting depth in real-time to better match their soil conditions while planting.

"The SmartFirmer allows producers to see the furrow moisture levels in real time, so they can change planting depth as needed as they move through a field," says Goebel. "Generally, producers have to get out of the cab to check soil moisture when planting and that's not practical or effective." Having high resolution maps of organic matter and CEC captured using SmartFirmers also will provide in field management zone information to guide variable rate decisions.

Visit your local [Challenger[®]](#) or [Massey Ferguson[®]](#) dealer for more information about the benefits of [White Planters](#) that are factory equipped with Precision Planting tools and technology. Visit [Precision Planting](#) to learn more about the products available today.

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¹ Summary of data from 20 Crop Tour sites in IN, IL, IA, MN, SD, NE, WI and OH over three years.

² Summary of data from 16 individual Crop Tour sites in IN, IL, IA, MN, SD, NE, WI and OH.

³ Summary of data from 17 Crop Tour sites in IN, IL, IA, MN, SD, NE, WI and OH over three years.

⁴ Summary of data from 19 Crop Tour sites in IN, IL, IA, MN, SD, NE, WI and OH over three years.

**Photo Captions are attached

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