



Mississippi Corn Promotion Board 2023 Progress Report

Project

Title: Increasing corn planting speed using off-the-shelf precision planting technology

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Department: Plant and Soil Sciences

Project Summary (Issue/Response)

Timely planting within favorable weather windows is a prerequisite for increased corn yield. Commonly used mechanical planters are limited to 4-6 mph, beyond which singulation and stand establishment are compromised. Planter speed limitations and narrow planting windows restrict the actual planted area, which is usually lower than intended acreage. However, opportunities to increase planter speed now exists with off-the-shelf precision planting technology that claims to improve singulation, emergence, and stand establishment. These claims require testing and validation before they can be recommended on a large acreage throughout Mississippi.



Project Results/Outcomes

Trials were planted at 2 locations (Starkville and Brooksville), as opposed to the three suggested for logistic reasons. The precision planter (John Deere® toolbar with Max-Emerge 2 row units retrofitted with Ag Leader® SureSpeed and SureForce hydraulic downforce) was tested at 6, 9, and 11 mph actual ground speeds. A mechanical planter (John Deere® 1700 ground-driven mechanical planter equipped with eSet meter and airbag downforce) was used as a current farmer practice check at 6 mph.



Preliminary results indicate no differences in plant stand or yield regardless of planter and speed (Figures 1 and 2). In the precision planter, increased planting speed did not affect seed placement uniformity as the overall planter precision and quality of feed remained relatively the same (Figures 3 and 4). As it pertains to the seed placement uniformity compared to the mechanical check, the precision planter performed better, even at the highest planting speed.

Project Results

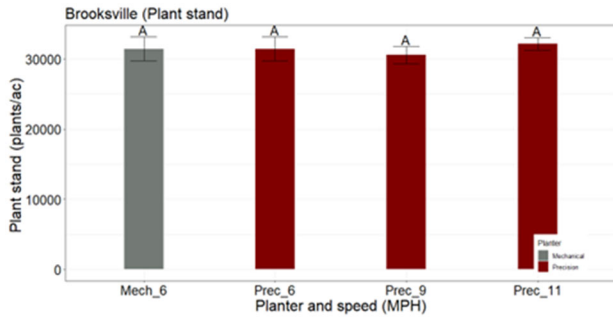


Figure 1. Typical plant stands response to planting speed in both locations. Means with the same letters are not significantly different.

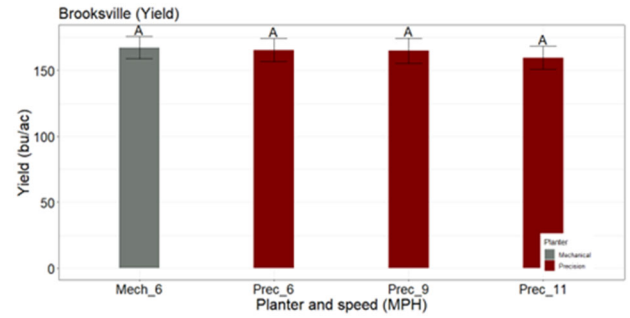


Figure 2. Typical yield response to planting speed in both locations. Means with the same letters are not significantly different.

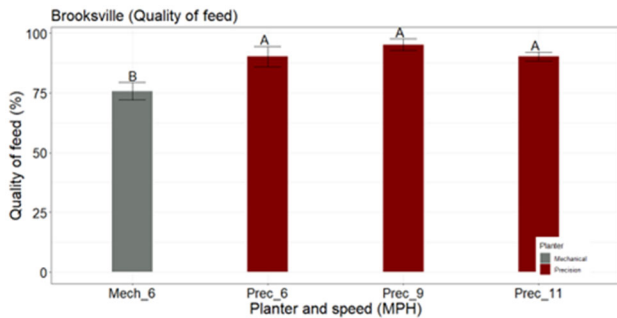


Figure 3. Typical planter performance (quality of feed) at different planting speeds in both locations. The higher the value, the better the performance. Means with the same letters are not significantly different.

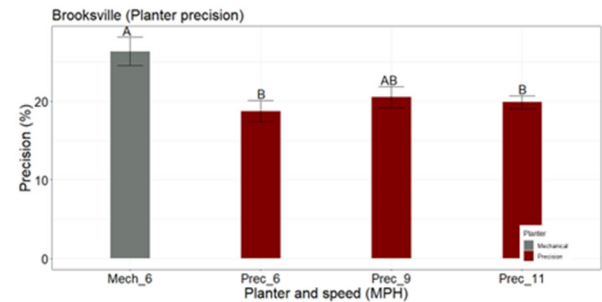


Figure 4. Typical planter performance (precision) at different planting speeds in both locations. The lower the value, the better the performance. Means with the same letters are not significantly different.

Project Impacts/Benefits

These preliminary results are encouraging and suggests the possibility of increasing planting speed without detrimentally affecting corn plant population, plant spacing, and yield in MS. Hence, MS corn producers can plant more acreage within the critical planting window and boost yield. Given the highly promising outcomes and significant progress achieved in the first year, we are enthusiastic about the potential for even more impactful results with additional funding. These findings have not only validated the importance of this research but have also set the stage for further advances.

Project Deliverables

Olomitutu, O. E., Dhillon, J., Mulvaney, M. J., Lowe, W. J., Bryant, C. J., Wallace, J., Harper, N., & Shavers, G. M. (2023) Corn Response to Planting Speed in Mississippi [Abstract]. ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO. <https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/149245>