2026 Georgia Peanut Commission - 1-Page Report

Precision Peanut Planter Kit to improve Seed Metering and Placement: PIs: Glen Rains, Wesley Porter

Objectives: The main objective of this study was to evaluate row-crop planter performance in peanut production systems and to provide research-based recommendations to improve seed metering performance and stand establishment. Specifically, the study aimed to quantify the effects of different ground speed and vacuum levels on emergence and spacing uniformity with three different seed metering systems, and to test higher than recommended vacuum levels using an electric seed meter under both laboratory and field conditions.

Methods: Field trials were conducted in 2025 in Tifton, GA and Midville, GA using three seed metering systems: a Monosem NG Plus 4 ground-driven seed meter (MS), a John Deere MaxEmerge ground-driven seed meter (JD) and a Precision Planting vSet electric seed meter (PP). Peanuts were planted at two speeds (5 and 8 km h^{-1}) under three vacuum levels (low, medium, and high), which were set according to each planters' recommended levels. Low was 50% lower, and high 50% higher than recommended levels. Emergence data were collected by counting plants from the middle two rows of each 4-row plot at multiple interval dates after planting. Plant spacing uniformity was evaluated by classifying each plant relative to theoretical plant spacing into double, perfect, skip, and long skip categories. Additionally, a very high vacuum level (35 in H_2O) above the manufacturer's recommended range was tested on the PP seed meter following a preliminary laboratory assessment conducted on a test stand, during which percent skips and percent doubles were measured using both a seed tube optical sensor and a computer vision software (UGA SeedPlate Inspector).

Results: The field trial showed significant differences in emergence across seed meter type, speed and vacuum level. The PP seed meter operating at 5 km h^{-1} with high vacuum achieved the highest stand counts and outperformed all other treatments, except PP at 5 km h^{-1} with medium vacuum and the MS seed meter at 5 km h^{-1} with medium vacuum. For the MS seed meter, plant population declined significantly with decreasing vacuum at both speeds and MS performance at 8 km h^{-1} was consistently lower than at 5 km h^{-1}. The JD seed meter showed a significant reduction in plant population as vacuum decreased at both speeds. Plant spacing analysis indicated that skips and long skips exceeded correctly spaced plants across all treatments, confirming limited singulation accuracy regardless of seed meter type. However, the highest percentage of correct spacings was recorded for PP seed meter at 5 km h^{-1} with high vacuum. The increased vacuum test indicated that PP seed meter performance improved under laboratory conditions at very high vacuum level, primarily due to a reduction in percent skips, as measured comparably by both seed tube optical sensor and computer vision software. In contrast, under field conditions, the very high vacuum level resulted in similar or lower emergence compared to the high vacuum treatment. The study concluded that optimal peanut stand establishment was achieved with the PP electric seed meter at 5 km h^{-1} and high vacuum, while MS and JD ground-driven seed meter were more sensitive to vacuum settings regardless of speed, and very high vacuum level did not improve field seed metering performance.

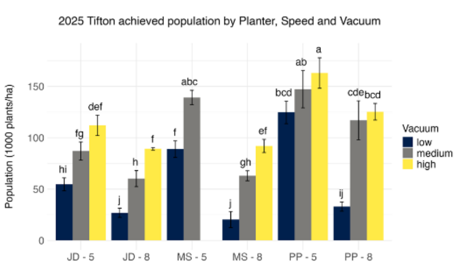

Figure 1: Plant population by Planter, Speed and Vacuum in Tifton ***field tests***

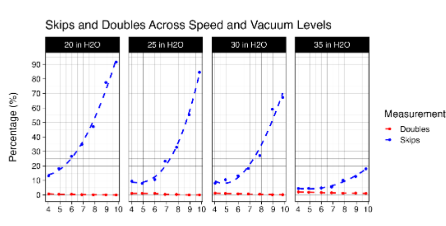

Figure 2: % skips and % doubles by speed and vacuum as detected under ***laboratory conditions*** *for PP electric seed meter*

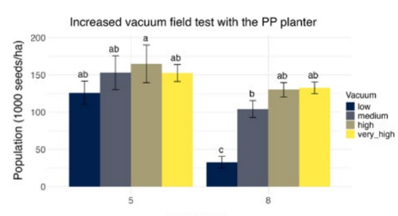

Figure 3: Increased vacuum ***field test*** *with the PP planter*