

## Evaluation of Soil Texture versus Planter Parameters for Uniform Crop Emergence in Peanuts

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A grower in Southeast Georgia (Jefferson County) was selected for conducting on-farm planter study based on the available downforce system on his planting equipment and grower interest. After consultation with the grower and considering the previous crop history, a field with varying soil conditions was selected to implement this downforce study during the 2019 growing season. During initial meeting, the grower was informed about how the research trial would be implemented and the plan for utilizing this information to help improve crop emergence by using correct planter settings as well as using this information to educate other growers across the state about importance of planter setup. Prior to planting, it was planned to collect soil EC data using a Veris Soil EC equipment for mapping soil texture variability within the field as soil texture is highly correlated to soil EC. However, the grower had already bedded the field before any data collection making it inaccessible for Veris data collection. Similar studies in corn and cotton in 2018 indicated good correlation between soil EC and soil type, thus soil map was downloaded (accessed from web soil survey) and analyzed to delineate zones of differentiating textures (EC zone 1 & EC zone 2) for this field as shown in Figure 1a & 1b, respectively. EC zone 1 represented light textured soil whereas EC zone 2 represented heavy textured soil. Three different downforce treatments (0, 100 & 200 lbs), including a grower preferred downforce of 100 lbs, were implemented in each zone by making adjustments to the manual downforce system on grower's planter. Crop emergence data was collected at one, two and three weeks after emergence (WAP) to assess downforce effect in each soil EC zone.

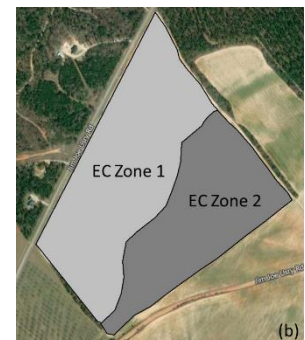


Figure 1. (a) Soil type and (b) soil EC map for the field selected in SE Georgia.

Results showed that the mean emergence recorded at one WAP in EC zone 1 (6% - 8%) was, on average, lower than emergence observed in EC zone 2 (12% - 13%). The final emergence (3 WAP) varied between 56% and 69% with the highest emergence (69%) attained at the higher downforce of 200 lbs in EC zone 1, and the lowest emergence (56%) attained at the grower preferred downforce of 100 lbs in EC zone 2. Results indicated reduced emergence in EC zone 2 (heavy texture soil), which was mainly attributed to the inadequate seed placement due to lack of sufficient planter downforce during planting. It was observed that even the highest downforce of 200 lbs was unable to create a well-defined furrow in heavy textured soil resulting in shallower depths or seeds laying on the soil surface. Future studies will include more fields to gather additional data as well as evaluate higher downforces (300 – 400 lbs).

