



Science  
Societies

# Using UAS to Evaluate Plant Height and Vigor in Runner Peanut Cultivars

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*The soil archive at the National Soil Survey Center. More than 80,000 of these samples have been scanned by mid-infrared spectroscopy. Photo by Jonathan Sanderman.*

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Peanuts are labor intensive and time consuming for breeders to evaluate and harvest. Manually and visually measuring plant height and growth vigor takes time and skill.

High-throughput phenotyping

(HTP) methods could help peanut-breeding programs evaluate more lines within a growing season, potentially accelerating genetic gain. Increasingly, unmanned aerial systems (UAS)-based imagery is being tested for this purpose.

Previous work in peanut has focused primarily on highly diverse material. A research team from the University of Georgia (UGA) recently investigated runner peanut cultivars developed by UGA with a narrow range of phenotypes, similar to what is seen in typical breeding nurseries. Several traits relating to plant height, stand establishment, seedling vigor, and mid-season plant vigor (canopy closure) were derived from UAS imagery and compared with manual/visual measurements.

The team observed high correlations and similar mean ranks for plant height ( $r^2 = 0.95$  and  $0.75$ , respectively) and mid-season growth vigor ( $r^2 = 0.75$ – $0.86$ ) between UAS-derived and manual measurements, indicating that UAS-derived methods provided similar results. Given the affordability and efficiency of data collection, UAS-based phenotyping provides a promising and powerful tool for peanut breeding programs.

**Adapted from** Brown, N., Zhang, J., Maleski, J., Schwartz, B., & Branch, W.D. (2022).

Utility of unmanned aerial systems for measuring plant height and plant vigor among several Georgia runner peanut cultivars. *The Plant Phenome Journal*, 5, e20053. <https://doi.org/10.1002/ppj2.20053>

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