



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.

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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