

## **Unmanned Aerial System (UAS) Phenotyping for Organic Peanuts**

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The use of Unmanned Aerial System (UAS) can accelerate peanut breeding by generating high-throughput data for analysis. The demand for organic peanut is on the rise, implying the need for organic peanut cultivars. The aim of this study will be to evaluate the feasibility of UAS phenotyping for agronomic traits in organic peanut breeding lines. UAS data will be collected from a total of twenty peanut breeding lines and cultivars from the peanut breeding program and genetics from Texas A&M AgriLife in Stephenville. Peanut lines will be established on organic plot at Texas A&M AgriLife at Vernon in the summer of 2021. UAS data will be collected from a SlatRange 4P+ sensor that will collect six different spectral bands. UAS flights will be conducted at 7, 14, 21, and 28 days after sowing to estimate stand count. During the reproductive stage, UAS flights will also be conducted once a week. The UAS data for each individual plot will be extracted using the QGIS software program. The UAS data will be used to derive the Normalized Difference Vegetation Index, Normalized Difference Red Edge Index, Canopy Chlorophyll Content Index, Chlorophyll Index Green, etc. for each peanut line using the Pix4Dmapper software program. Data analysis will be conducted at the UAS data analysis station at Texas A&M AgriLife in Vernon. We expect to identify statistically significant differences in the UAS data and a significant correlation between the UAS data and agronomic traits. The results from this study can accelerate breeding for organic peanuts adapted to North Texas.