

## **Deriving Peanut Plant Height from Aerial Imagery and Digital Elevation Models**

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Peanut is an important food and oilseed crop in the United States and worldwide. It is an economical crop and nutritious food with multiple health benefits. However, most peanut growing areas experience frequent droughts and disease outbreaks, which leads to reduced yield and quality. Though cultural methods have been successful in mitigating the biotic and abiotic stresses, these methods are expensive. The newly released cultivars have improved yield and disease resistance, but traditional breeding is slow.

Being a unique plant with the harvestable crop below the ground, the only way to detect plant stress is observing the above ground biomass. This makes physiological plant attributes like height, leaf color, and Leaf Area Index important observations in selection for better cultivars and crop management decisions. For example, plant height has been associated with drought tolerance, fungal disease resistance, and nutrient stress. However, direct measurement of plant height on large acreage is impractical.

With the advancement of technology, several methods have been proposed to estimate plant height using remote sensing. Among these, digital elevation models (DEM) from RGB images taken aerially using UAVs were used to create and categorize different plant heights with accuracy to the centimeter. We will present our preliminary data on plant height extraction from DSM in peanut.