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A remote sensing approach to measuring in-season canopy cover percentage of sugarbeets.

In agricultural research, optimizing and standardizing in-season data collection methodologies is critical for creating a workflow that produces accurate, reliable, and repeatable results. In trials where experimental treatments are expected to impact sugarbeet growth, canopy cover % provides valuable insights to help quantify treatment effects. Unfortunately, it is often time consuming and challenging to accurately capture canopy cover % in a truly representative way. Amalgamated Sugar agronomists have used a range of methods to measure canopy cover, including manually counting sugarbeet leaves and employing RGB imaging software such as the Canopeo App (<http://www.canopeoapp.com>). These methods have proven useful; however, they still have room for improvement. In 2024, we tried a remote sensing-based approach to address these concerns. We used unmanned aerial vehicle (UAV) technology paired with geospatial software to measure canopy cover percentages of field trials throughout the growing season. Images collected by the Mavic DJI 3M drone during autonomous flights were stitched using PIX4D Fields software, then uploaded into ArcGIS Pro where the Difference Vegetation Index (DVI) was used to calculate canopy cover percentage for the center two data rows of individual plots. This new method has greatly improved the accuracy of our canopy cover measurements, standardized our approach, and enabled us to confidently compare rates of canopy growth between different treatments in various locations and across multiple years. In 2025, we look to further expand on this work by using multispectral UAV technology to measure early season stand counts and a range of plant health metrics such as NDVI and NDRE.

