Proximal Sensing Can Estimate Forage Sorghum Yield

Proximal crop sensing has been used for predicting crop yield, the first step in development of algorithms for sensor-based N management. Most studies were conducted with grain crops, but a recently published article in Agronomy Journal discusses the use of crop sensors for yield prediction of brown midrib dwarf brachytic forage sorghum (Sorghum bicolor L.) in the Northeast.

The study evaluated the impact of timing, sensor orientation, and height of scanning and the use of Normalized Difference Vegetation Index (NDVI) data versus in-season estimated yield [INSEY = NDVI/days after planting (DAP) or growing degree days (GDD)] on the ability of sensor data to predict yield of forage sorghum harvested at soft dough.

Sensor height and orientation impacted measurements up to 45 days after planting but not once was the canopy was fully developed. The most accurate yield predictions were obtained 49 DAP when sorghum was 0.76 m tall. The INSEY expressed as plant growth per day (INSEY_{DAP}) best correlated with yield. The results of the study show that crop sensors can be used to accurately predict forage sorghum yield, but timing of scanning and scanning height and orientation need to be standardized to obtain algorithms that can cover a larger region.


Using a Rising Plate Meter in Multi-Species Pastures

The rising plate meter has been used for several decades to estimate forage yields in pastures containing only one or two forage species. However, pastures with multiple forage species have challenged yield estimations due to differences in growth habit and growth rate of the forages. This can lead to gross miscalculations in forage budgeting.

In an article recently published in Agricultural & Environmental Letters, researchers found that when estimating forage yield of pastures containing diverse forage species, use of quadratic or cubic relationships did not increase the robustness of the calibration equations. Setting the equation so 0 kg of biomass equals 0 plate meter height resulted in a 43–89% increase in the fitness of the calibration equations.

The rising plate meter is an important tool for producers to make forage management decisions; however, frequent and accurate calibration is critical when forage conditions change (e.g., forage structure, maturity, and species). Additional research is necessary to further increase the accuracy of the rising plate meter for on-farm use in pastures containing multiple forage species, which is typical of pastures in many temperate regions of the United States.


Forage sorghum N rate trial in central New York. Proximal sensing can be used to predict end-of-season yield.
