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Predicting cover crop nitrogen with an optical sensor

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Lead author of the study Charlie White walks a handheld NDVI sensor across a cover-cropped field to estimate cover crop biomass N content in the spring. Photo by Natalie Lounsbury.

Cover crops provide many services related to nitrogen (N) management but being able to monitor and manage for these services has some limitations. The traditional method for measuring cover crop biomass N content is both time consuming and expensive. Farmers and agronomists must hand-clip a quadrat of biomass, dry and weigh it, and then submit the tissue sample to a lab for chemical analysis.

In an article recently published in *Agricultural & Environmental Letters*, researchers report on a new method that uses an optical sensor to estimate cover crop biomass N content. The sensor is based on a calibrated relationship with the normalized difference vegetation index (NDVI). Researchers used a widely available handheld sensor (GreenSeeker HCS-100, Trimble Navigation) to obtain the NDVI of the cover crop canopy in nearly 600 research plots. The cover crop biomass N content in these plots was also measured through the traditional method, involving hand-clipping and laboratory analysis. Multiple cover crop species and mixtures were included in the study, and the data analysis revealed five different calibration equations to predict N content depending on the species and whether the measurement is made in fall or spring.

The authors concluded that the optical sensor is relatively accurate, measurements are simple to take, and the results are available immediately. These factors could facilitate future advancements in site-specific monitoring and management of cover crop N-related services by farmers and agronomists.

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White, C. M., Bradley, B., Finney, D. M., & Kaye, J. P. (2019). Predicting cover crop nitrogen content with a handheld normalized difference vegetation index meter. *Agricultural & Environmental Letters*, *4*(190031).

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