Science Societies

Predicting Cover Crop Biomass from Early-Season Biomass and Weather Data

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Cereal rye cover crop after termination. Photo by Muthukumar Bagavathiannan.

Farmers are increasingly interested in using winter cover crops such as cereal rye to suppress weeds and to reduce soil erosion and nutrient loss. Cereal rye's capacity to provide these benefits depends on how much biomass it accumulates during the growing season. However, scientists have limited understanding of how such accumulation varies by management decisions, environmental factors, and weather.

A large team of multi-state researchers gathered field data across 11 states from 2016 through 2020 in the eastern United States. Analyzing the data, they found that higher early-season cereal rye biomass and warmer temperatures in late spring were both associated with higher late-season cereal rye biomass. More specifically, the researchers were able to use modeling to predict late-season cereal rye biomass with a relatively low margin of error based on the following predictors: early-season biomass, growing degree days, cereal rye planting and termination dates, available sunlight, precipitation, and site coordinates.

In the future, researchers could combine similar modeling approaches with early-season biomass estimates, such as those collected by satellites, to improve decision support tools and help growers determine when to terminate cover crops for optimal biomass.

Adapted from

Huddell, A., Needelman, B., Law, E. P., Ackroyd, V. J., Bagavathiannan, M. V., Bradley, K., … & Mirsky, S. B. (2024). Early-season biomass and weather enable robust cereal rye cover crop biomass predictions. *Agricultural & Environmental Letters*, *9*, e20121. https://doi.org/10.1002/ael2.20121

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