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Using the Fieldprint Calculator to Evaluate Differences in Sustainability Metrics Across Various Cover Crop Treatments in Georgia

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Abstract

Cover crops have been proven to provide a variety of benefits ranging from improvement in soil organic matter, nitrogen supplementation, and soil moisture retention. Though cover crops are not a new technology, they are not widely adopted. An on-farm trial evaluating the benefits and effects of cover crops was established in Terrell County, Georgia. In 2021 and 2022, upland cotton (*Gossypium hirsutum*) was planted following cover crops into a 24-hectare field which was split into 4, 6-hectare cover crop plots. One cover crop treatment was applied per plot: rye (*Secale cereale*), crimson clover (*Trifolium incarnatum*), a two-way mixture of rye and hairy vetch (*Vicia sativa*), and a four-way mixture of rye, clover, vetch, and black oat (*Avena sativa*). These treatments represent popular cover crop options for growers in the Coastal Plain soil type, found in much of area where the trial was implemented. Cover crop biomass samples were collected from each plot to determine the amount of nitrogen (N) to be released throughout the growing season. Each plot, excluding rye, was split into two sub-plots. One sub-plot received a full rate of synthetic N fertilizer and the other received a reduced rate based on the UGA Cover Crop Calculator and the biomass samples obtained. To measure the impact of cover crops and reducing synthetic N applications on on-farm sustainability, the Field to Market Fieldprint Calculator was used. Yearly field management practices were entered and numerical scores for eight sustainability metrics, including energy use and greenhouse gas emissions, were generated. The implementation of cover crops and reducing the rates of synthetic N on cotton, improved on-farm sustainability by reducing energy used and greenhouse gas emissions across both years of the study.

Keywords: Sustainability, Cover Crop, Field to Market