Cover-Crop Trial, 2021-2024

Introduction:

Many seed companies and clientele that specialize in forage crops have expanded some of their products to act as cover crops in mixtures or in monoculture. The majority of the time cover crops are planted prior to grain crop production to stabilize residual nitrogen or to increase nitrogen content (via legumes) for the following crop. Seed companies do not always have an outlet to test state wide cover crop performance.

Protocol:

Cover crop entries (pure or mixtures) will be fall planted from October 1st-15th at the recommended seeding rate for each species. The entire study will be limed and fertilized with P and K according to the soil test recommendations. No nitrogen will be applied to any plots during the cover crop. Termination of the cover crop will take place on April 1st and April 15th to be considerate of corn, cotton, and soybean management systems. Termination treatments in March are not being used because previous research has concluded that little growth is accomplished before April from the cover crops. Entire plots will be harvested with a subsample removed to determine dry matter and analyzed for forage quality using NIRS. N availability will be predicted using the N availability equation from the University of Georgia. The study will include 3 replications at three locations.

Plots will consist of two drill passes (12 ft x 12 ft) with half the plot being used for comprehensive sampling where plot biomass is allowed to be incorporated into the soil and corn planted into it. The remaining half will be used for the collection of biomass yield and forage quality samples. This trial will be planted in the same plot for three years to assess total soil N contribution of the cover crop in each plot over time.

Plots will be harvested using a Winterstieger equipped with a forage Cibus F plot harvester reel type header that collected a 4.8 ft x 10 ft swath to calculate total yield. A subsample was collected and dried at 140 °F until constant weight was achieved to calculate dry matter (DM) concentration. Forage quality will be estimated using NIR (Foss 2500, Foss North America, Eden Prairie, MN) and the 2018 mixed hay equation of the NIRS Forage and Feed Testing Consortium (Madison, Wisconsin). Data was used to populate a 'Nitrogen Availability Calculator' Model (http://aesl.ces.uga.edu/mineralization/) developed by the University of Georgia College of Agriculture and Environmental Sciences (Athens, GA) to report estimated N availability after two weeks, four weeks and three months post termination (Tables 4 -5).

Data Collected:

N availability estimate (two week, four week, and three months), Dry matter yield. Soil nitrogen composition.

Location: Starkville, Newton, Brooksville

Duration: Three years..Plots planted annually in same plot for three years

Entry Fee: $3000 for each entry (one time fee for three years).

10 pounds of seed sent by September 15th with the appropriate entry form

Checks made out to: Mississippi State Forage Variety Testing

Seed and Checks sent to:

Department of Plant and Soil Sciences
Attn: Joshua White
32 Creelman St
Mississippi State, MS, 39762