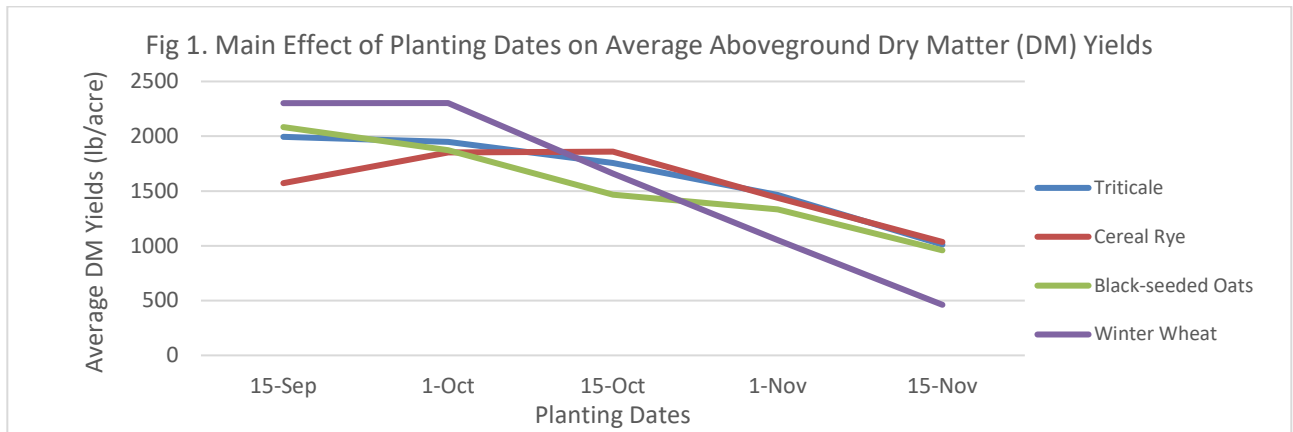


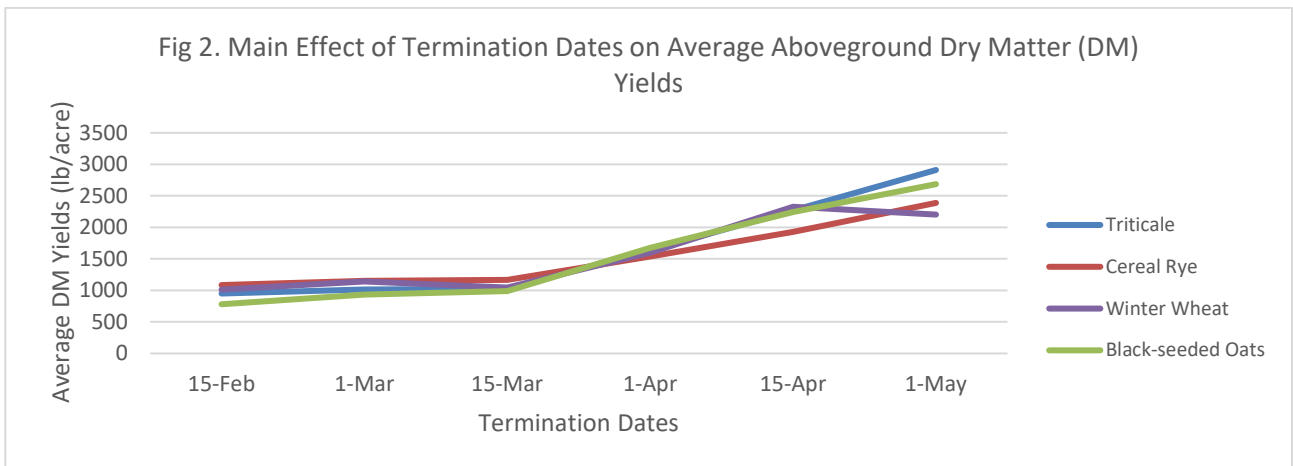
# NRCS Jamie L. Whitten Plant Materials Center 2022 Progress Report of Activities – December 2022

## Cover Crop Planting and Termination Study

The objective of this study was to identify ideal planting and termination dates of black-seeded oats, triticale, cereal rye, and winter wheat to achieve maximum soil health benefits in the mid-South. Planting dates were 9/15, 10/1, 10/15, 11/1, and 11/15; in combination with termination dates of 2/15, 3/1, 3/15, 4/1, 4/15, and 5/1. The study was conducted in 2020 and 2021. For all species, average aboveground dry matter yields (lbs/acre) were higher when planted between September 15 - October 15 across termination dates (Fig. 1). Grasses planted November 1 and November 15 averaged lower aboveground dry matter yields compared to the three earlier planting dates (Fig.1). Regarding termination dates, average aboveground dry matter yields increased as termination was delayed (Fig. 2). Average dry matter yields increased considerably when termination was delayed until on or after April 1 across species (Fig. 2). As a result of this study, we would recommend that if these cover crop species are not planted by October 15, then termination should be delayed until April 1 to achieve greater dry matter yields. However, if these cover crop species are planted by October 15, then termination can take place any time on or after February 15.



**Figure 1. Cover crop dry matter yields (lb/acre) by planting date for 2020 & 2021 at the Jamie L. Whitten PMC.**



**Figure 2. Cover crop dry matter yields (lb/acre) by termination date for 2021 & 2022 at the Jamie L. Whitten PMC.**

## **Adaptability of Cover Crop Species to a Fall High Tunnel Environment in the Mid-South**

This study was created to address a Needs Assessment entry from the TN NRCS Ecological Sciences team to assist Urban Agriculture efforts in TN. In the mid-South high tunnel tomato production is very popular leaving a window for soil cover in the fall to address resource concerns. The objective of this study is to determine the adaptability of fall planted cover crops in a high tunnel in the mid-South. Twelve warm season and cool season cover crops each were planted September 15 and November 1, respectively. Warm season cover crops will be terminated at 50% anthesis or winterkill. Cool season cover crops will be terminated at 50% anthesis or by February 15. Evaluations include percent emergence, percent ground cover, soil moisture, above ground biomass, and plant height. This study was started in 2022 and will be repeated multiple years at different locations.



**Figure 3. High tunnel study site located at the Alcorn State University Extension/Research Farm & Technology Transfer Center in Mound Bayou, MS.**

## **Southeastern USA Native Grass & Forb Adaptation Study**

To address the Climate Smart Agriculture initiative, seven Plant Materials Centers (covering the southeastern USA) are cooperating on a 5-year study to evaluate the adaptation of multiple native grass & forb species. Observational plantings are used in the NRCS Plant Materials Program to determine the potential area/region of adaptation of new plant selections or plant releases. These plantings are conducted at PMCs in single rows or plots and plants are evaluated for adaptation and performance over multiple years using a commercially available cultivar of the same species or similar species. Results from observational plantings are incorporated into release notices, release brochures, planting guides, and other informational documents. Germplasm and cultivar releases that show adaptation at other PMCs warrant additional plantings and evaluations in these areas of use to support their inclusion into states' FOTG. This testing increases PMC release efficiency by reducing the number of releases needed by broadening the area of use and makes the releases more desirable for commercial producers.



**Figure 4. Study site located at the Jamie L. Whitten PMC.**

## **Long Term Soil Health Study**

Cover crops may offer targeted solutions for specific resource concerns such as early season weed control, reduction in wind and water erosion, and preservation of soil structure and pore space that facilitates adequate drainage. However, integrating cover crops into a corn and soybean rotation in Mississippi can be costly due to up-front seed costs and additional planning and labor to manage and terminate cover crops. So how do the overall production costs and resource benefits stack up over a three-year period? We designed a study to measure the overall input costs and resource benefits at the Jamie L. Whitten PMC to find answers for producers and NRCS planning staff.

Most producers have a range of management practices that may differ across the farm or even across each field where two primary areas of control are exerted such as 1) tillage practices (conventional tillage vs no-tillage) and 2) winter cover management (bare over the winter/treated with residual herbicide, winter weeds left to grow, and planted with a cover crop mix). Our study tracked six management systems with differing combinations of tillage and winter cover management. We totaled seed costs, labor, fuel, herbicide, and application costs. Tracking different systems meant that producers could directly compare common scenarios to change management decisions. Though crop yields varied, the cost of cash crop production in the conservation system (no-tillage+ cover) was 43% less than the cost of the conventional system [\$29.67 per Mg (Megagrams) of crop yield in the conv. till + bare to \$17.04 per Mg of crop yield in the no-till + cover crop system], highlighting a short-term economic incentive for producers to switch from conventional tillage + bare to no-tillage + cover crops. The greatest resource benefit from the conservation system was a reduction in RUSLE2 estimated soil loss, as mean soil loss decreased by 86% compared to the conventional system (3.5–25.1 t ha<sup>-1</sup>). These results suggest that Mississippi producers should consider the costs of cover crops in terms of overall cash crop production, rather than by only crop yields. This also suggests that cover crops are more economically viable for farming operations when they are planted in no-tillage systems.

Special thanks to Alayna Jacobs for providing this information from her doctoral research at the University of Kentucky. NRCS employees have access to the entire journal article here: [Cover crops and no-tillage reduce crop production cost and soil loss, compensating for lack of short-term soil quality improvement in a maize and soybean production system](#)

## **Cover Crop Selection and Calculator Tool for the Mid-South**

The [Cover Crop Selection and Calculator Tool for the Mid-South](#) is a one stop shop for mid-South conservation planners to select cover crops species that are adapted to the cash crop produced, resource concerns present, and producer goals as well as estimated seed costs and seeding rates. The document also includes recommended cover crop mixes for users unfamiliar with developing mixes and a customizable mix calculator option for more familiar users.

## **Publications, Presentations, Training, & Outreach**

- [Progress Report of Activities – 2021](#)
- [Mid-South Plant News – 2022](#)
- Mississippi NRCS EQIP Statewide Training – TEAMS presentation to MS NRCS staff about current research focus and activities at the PMC.
- Pollinator/Wildflower Field Training (June 16 & 18, 2022) – in conjunction with MS NRCS Area 1 & 4, PMC staff provided training on establishing and maintaining pollinator plantings. Participants toured PMC pollinator fields with hands on training.
- PMC Tour of Activities – showcased MSPMC studies and facilities to MS NRCS ECS staff and Regional Soil Health Specialists. Group also visited local cotton farm operation.
- Cover Crop Training – MS SRC & PMC staff provided in person cover crop training to MS Area 1 staff. Remaining MS Area offices received training in FY23.
- Provided 4 ROV Training opportunities for MS NRCS staff.

## **The Jamie L. Whitten Plant Materials Center**

The Jamie L. Whitten Plant Materials Center (MSPMC) works with NRCS field offices and land managers in Mississippi, Louisiana, Alabama, Arkansas, Kentucky, Missouri, and Tennessee. The MSPMC provides vegetative solutions for soil health, pastureland improvement, cropland erosion, critical area erosion control, urban conservation, wildlife habitat enhancement, and water quality improvement. The center also releases improved conservation plants addressing resource challenges such as wetland mitigation, erosion control, riparian buffers, and wildlife habitat.

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