U.S. DEPARTMENT OF AGRICULTURE

Elsberry Plant Materials Center

Report of Activities

2025

The Elsberry Plant Materials Center (MOPMC) is located along the Mississippi River about an hour drive north of downtown St. Louis, Missouri. The PMC was established in 1934 as a production nursery for various tree seedlings. Today, the PMC develops conservation plants and new planting technology for Illinois, Iowa, and Missouri, as well as other states in the north-central region of the US. The Center has developed more than 80 conservation plants since it began. The PMC consists of 215 acres on both upland and bottomland soils. The priority resource concerns are water quality and soil health. In recent years, the focus has been on soil health, primarily looking at the benefits of a reduced tillage system with a cover crop component.

Go to Missouri Plant Materials Center

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State Conservationists

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Tammy Willis – Illinois

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New Cover Crop Root Characteristic Study

FIGURE 1. ERIN TAPLEY DIGS TRENCH FOR ROOT GROWTH CHAMBERS.

Cover crops can address resource concerns like soil compaction, erosion, infiltration, and nutrient retention, all of which are directly impacted by the roots of the cover crop species selected. This year, a new study aimed at characterizing the rhizosphere of commonly used cover crops began at the Elsberry PMC. This study will compare the root biomass, depth, and density of different cover crop species within the same functional groups. Staff used 5-foot-tall PVC growth tubes that were placed in-ground. The first year is focused on comparing common cool season grass species including winter wheat, cereal rye, black oats, and triticale. The root tubes were planted on September 30th, and aside from some deer nibbles, the plants look great! We are excited to see how much below-ground biomass these plants can produce in a single growing season.

FIGURE 2. ROOT GROWTH CHAMBERS WERE PLANTED IN SEPTEMBER 2025.

Multi-Site Seeding Rate Study for CPS 340 Revision

FIGURE 3. PMC STAFF PLANT STUDY PLOTS IN ALBANY, MO.

This year PMC staff implemented a cover crop seeding rate study to help inform proposed revisions to the MONRCS Cover Crop Conservation Practice Standard 340. This study will examine whether reduced seeding rates for cereal grain cover crops will be as effective at producing biomass, suppressing weeds, and preventing soil loss as the current MO NRCS recommended rate of 40 lb. per acre. The study compares three seeding rates and an unplanted control (0, 20, 30, and 40 lbs. per acre) and is taking place at three locations across the state including the MU Hundley-Whaley Research Center in Albany, MO, Convoy of Hope Center for Agriculture and Food Security in Springfield, MO, and at the Plant Materials Center in Elsberry, MO. We hope to add an additional site in Portageville, MO next year to represent the southeastern growing zone of Missouri.

FIGURE 4. CONVOY OF HOPE STAFF PLANT STUDY PLOTS IN SPRINGFIELD, MO DURING GOVERNMENT SHUTDOWN.

National Cover Crop Seeding Rate and Date Trial

The Elsberry PMC is one of 12 PMCs to participate in a national study on the effects of seeding rate and seeding date on biomass accumulation and canopy cover of cool season grass and legume cover crops for production agriculture. For this study, cereal rye and hairy vetch are planted at three different seeding dates with 5 seeding rates. Cereal rye planting dates range from mid-September to the end of October and seeding rates include 15, 30, 60, 90, 120 PLS lbs. per acre. Hairy vetch planting dates range from late August to mid-October and seeding rates include 5, 10, 20, 30, and 45 PLS lbs. per acre.

Second year results for cereal rye mirrored those from the 2024 season: lower seeding rates and later planting dates reduced fall canopy cover, but spring canopy and biomass were not affected by either factor. In the first year of the hairy vetch study, earlier planting increased fall canopy across all seeding rates. Early planting also allowed seeding rates from 10 to 30 lbs. per acre to achieve comparable fall canopy cover to the 45 lb. per acre rate. Surprisingly, these results did not carry over into the spring. Instead, the more mature vetch from the earliest planting date experienced more winterkill than the younger, later-planted plants, leading to slightly lower spring canopy cover under the earliest planting date compared to the median planting date.

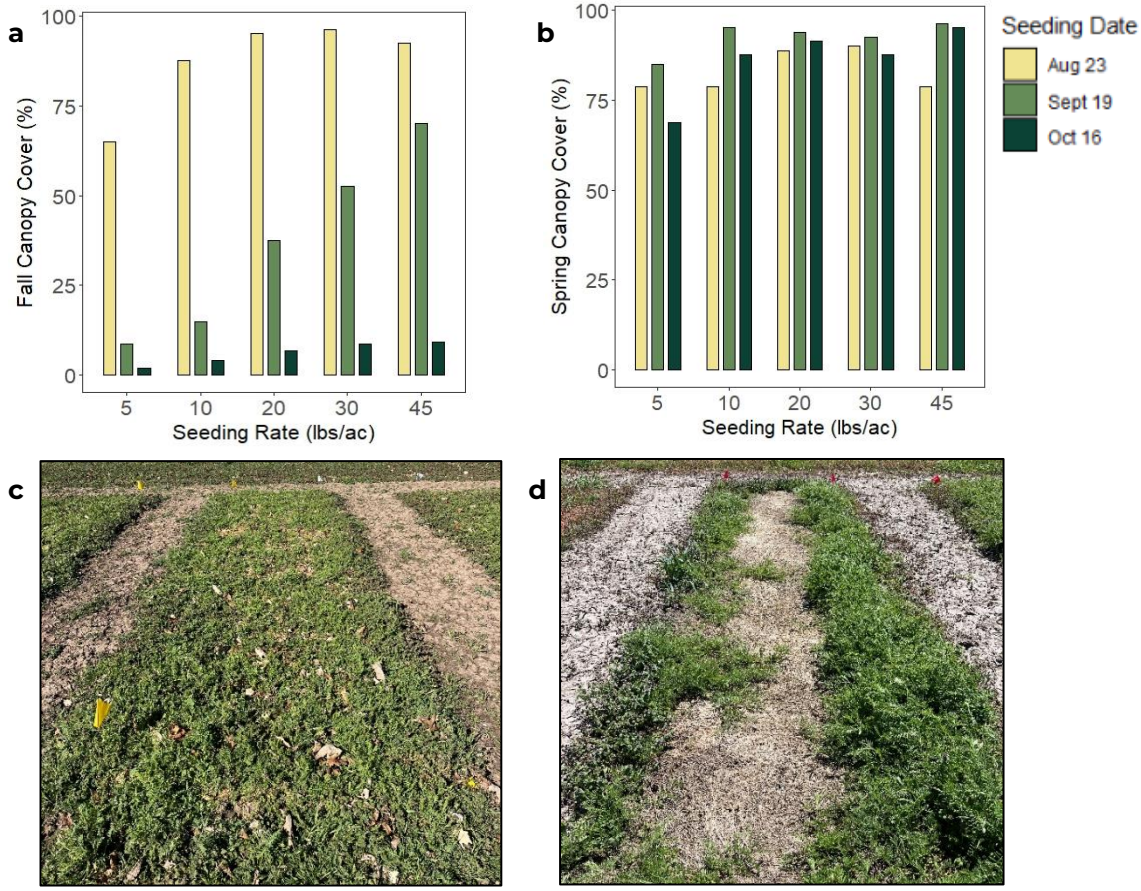

FIGURE 5.

SEEDING RATE AND DATE EFFECT ON HAIRY VETCH FALL (a) AND SPRING (b) CANOPY COVER. EARLY PLANTED HAIRY VETCH HAD SUPERIOR FALL CANOPY (c), BUT THE MORE MATURE HAIRY VETCH SUFFERED GREATER WINTER KILL (d) IN THE 2024-2025 SEASON.

Hairy Vetch Seed Increase

FIGURE 6. (LEFT TO RIGHT) INFECTED 24NCEHV HAIRY VETCH PLANTS COMPARED TO HEALTHY NCLHV PLANTS IN MAY 2025.

The Elsberry PMC continued to participate in the hairy vetch (*Vicia villosa*) seed increase trials in collaboration with the Agricultural Research Service (ARS). This study aims to increase the available seed of newly developed hairy vetch lines that have been bred for desirable cover crop traits, like reduced hard seededness and early flowering. Three lines were assigned to the PMC this year including two varieties from North Carolina, one early flowering and one late flowering, and one bulk variety from Maryland (24NCEHV, 24NCLHV, and 24MDHV, respectively). Unfortunately, we lost our early flowering North Carolina line (24NCEHV) to what looked like a botrytis gray mold infection. Below are the seed amounts from the two surviving lines that were harvested, cleaned, and provided to the ARS in Wisconsin for further testing and seed increase.

TABLE 1. 2025 HAIRY VETCH SEED YIELD FROM TWO ARS HAIRY VETCH LINES.

Hairy Vetch Line	Amount of Seed Sown (g)	Amount of Harvested Clean Seed (lbs)
24NCLHV	50	4.30
24MDHV	50	5.50

PMC Field Activities

Because study sites are moved from year to year and seed production plots are periodically phased out and reestablished, significant time and effort goes in to maintaining both active sites and unplanted sites that may be used in the future. This year, PMC staff planted open fields with warm and cool season cover crops, reestablished an Ozark Germplasm little bluestem seed production plot, and conducted prescribed burns on seed production acreage, among other land management activities.

FIGURE 7. (TOP LEFT) EARLY SPRING BURN ON SIDEOATS GRAMA PLOTS. (TOP RIGHT) DIVERSE WARM SEASON COVER CROP AT PMC. (BOTTOM LEFT) REESTABLISHING OZARK GERMPLASM LITTLE BLUESTEM PLOT. (BOTTOM RIGHT) SIXTEEN-FOOT-TALL SORGHUM SUDANGRASS GROWN FOR WARM SEASON COVER CROP SEED AT THE PMC.

High Tunnel Construction Training

On March 26th, the Elsberry PMC held a high tunnel training for MO NRCS Conservation Planners from Area 2 and 3. Attendees delved into the specifications of the High Tunnel Conservation Practice Standard before getting some hands-on experience stretching and attaching the plastic covering to the hoop frame onsite at the PMC. Thanks to those who helped plan and coordinate this event and to attendees for their hard work!

FIGURE 8. (LEFT) ATTENDEES PULL PLASTIC SHEETING OVER FRAME. (RIGHT) GROUP PHOTO AFTER SECURING THE PLASTIC!

Spring Cover Crop Training

On May 7th, the Elsberry PMC staff held a Spring Cover Crop Training in coordination with the Midwest Cover Crop Council, MU Extension, and MO NRCS Soil Health Specialists. Designed for new NRCS employees, the training covered a wide range of topics including cover crop identification, benefits, and biology as well as management aspects like crop rotations, termination method and timing, and residue management. The early May weather was perfect, allowing attendees to experience a mix of hands-on field activities along with in-depth classroom instruction. We appreciate Soil Health Specialists Drexel Atkisson, Lucas Brass, and Luke Skinner, who helped put on this event, as well as the employees from NRCS and partnering agencies who attended and made this training a success.

FIGURE 9. (LEFT) MU EXTENSION AGENT, CHARLIE ELLIS, SPEAKS TO THE GROUP ABOUT COVER CROP TERMINATION TIMING. (CENTER) SOIL HEALTH SPECIALIST, LUKE SKINNER, GIVES A PRESENTATION ON COVER CROP BIOLOGY. (RIGHT) SOIL HEALTH SPECIALIST, LUCAS BRASS, USES THE SOIL HEALTH DEMO TRAILER TO GIVE A VISUAL DEMONSTRATION OF THE BENFITS OF COVER CROPS.

Seed Production of Conservation Plants

Beginning in 1952, the MOPMC began selecting and releasing plants to aid various conservation efforts such as soil erosion control, plant diversity and restoration, wildlife habitat improvement, soil enhancement and fertility, grazing and forage, and other conservation uses. As of 2025, the PMC has developed over 90 conservation plant releases with 74 of them actively produced on the commercial market and approximately 35 currently maintained by the PMC.

Plant Releases in Current Production at the Elsberry Plant Materials Center

Species	*Release*
big bluestem (*Andropogon gerardii*)	OZ-70 Germplasm
big bluestem (*Andropogon gerardii*)	Refuge Germplasm
big bluestem (*Andropogon gerardii*)	'Rountree'
big bluestem (*Andropogon gerardii*)	Northern Missouri Germplasm
little bluestem (*Schizachyrium scoparium*)	Northern Missouri Germplasm
little bluestem (*Schizachyrium scoparium*)	Ozark Germplasm
switchgrass (*Panicum virgatum*)	'Shawnee'
switchgrass (*Panicum virgatum*)	'Cave-in-Rock'
sideoats grama (*Bouteloua curtipendula*)	Northern Missouri Germplasm
Indiangrass (*Sorghastrum nutans*)	'Rumsey'
tall dropseed (*Sporobolus compositus*)	Northern Missouri Germplasm
Virginia wild rye (*Elymus virginicus*)	Cuivre River Germplasm
foxglove beardstongue (*Penstemon digitalis*)	Northern Missouri Germplasm
wild bergamot (*Monarda fistulosa*)	Western Missouri Germplasm
pale purple coneflower (*Echinacea pallida*)	Northern Missouri Germplasm
greyhead coneflower (*Ratibida pinnata*)	Northern Missouri Germplasm

PMC STAFF - (LEFT-RIGHT) JENNIFER HOWARD, BIOLOGICAL TECH AID; ERIN TAPLEY BIOLOGICAL TECHNICIAN; TORRI HOLDER, PMC STUDY LEADER; RON CORDSIEMON, PMC MANAGER.

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