



Elsberry Plant Materials Center 2022 Progress Report of Activities



The Elsberry Plant Materials Center (PMC) 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.



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2022

Plant Materials Center Staff

Ron Cordsiemon – Manager
Mollie Herget – Study Leader
Erin Tapley – Biological Technician
Bob Laird – Part-time

State Conservationists

Scott Edwards – Missouri
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Observational Plantings of Plant Materials Program Germplasm

Observational plantings are used in the NRCS Plant Materials Program to determine the potential area of adaptation of new plant selections or plant releases. These plantings are conducted at the PMC 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. As a result of the Climate Smart Agriculture Action Plan, the Plant Materials Program initiated an observational planting focusing on several plant species indigenous to the southeastern United States.

Twenty-nine varieties of thirteen species sourced from southeastern Plant Materials Centers were evaluated for this observational planting. Species include switchgrass, Indiangrass, big bluestem, little bluestem, splitbeard bluestem, wildrye, paspalum, gamagrass, herbaceous mimosa, ashy sunflower, swamp sunflower, thickspike gayfeather and velvet rosette grass. Plants will be evaluated for survival, plant height, vigor, cold tolerance, drought tolerance, insect and disease resistance for three years.

Results from this observational planting will be 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.



Twenty-nine different native varieties and species were established at Elsberry, MO for evaluation in an observational planting.

Hairy Vetch Seed Increase

The PMC once again participated in the hairy vetch (*Vicia villosa* Roth) trials in collaboration with the Agriculture Research Service (ARS). Two lines of hairy vetch seed were assigned to the PMC to propagate and harvest seed from. The two lines include 'North Carolina 21NCLHV' and 'Maryland 21MDHV'. Seed provided to the Elsberry PMC were propagated in the greenhouse and grown in plastic mulch. There were



Hairy vetch seedlings growing in plastic mulch.

approximately 700 seedlings of the North Carolina line and 1,000 of the Maryland line. Mature plants were cut, dried and seed processed through a combine on July 22. Below are the amounts that were cleaned and sent to the ARS office in Wisconsin.

Hairy Vetch Line	Amount of Seed Planted (grams)	Amount of Harvested Cleaned Seed (pounds)
North Carolina 21NCLHV	60	1.02
Maryland 21MDHV	55	1.95

Revised Midwest Cover Crop Council Decision Tool

The Midwest Cover Crop Council (MCCC) facilitates the sharing of cover crop knowledge within the Midwest and beyond. In 2022, the PMC was tasked with assisting the MCCC to revise the existing Cover Crop Decision Tool. This tool is a web-based system used to assist farmers in selecting cover crops for their field and vegetable crop rotations. Cover crop information is consolidated by state to help producers make selections at the county level.

The MCCC Cover Crop Decision Tool was updated to reflect new findings on cover crop research, as well as match enhanced web technology, become mobile friendly and ADA compatible. New cover crop information was added to the tool via scientific literature as well as experts with hands-on field experience. Elsberry PMC staff provided input on new cover crop information gained from their cover crop adaptation trial, planting date, seeding rate, and weed management studies conducted at the PMC within the last six years. For each state, the tool now reflects cover crop species most used in each county, as well as other plant attributes such as establishment period, seeding rate and planting depth. The revised decision tool can now be viewed at midwestcovercrops.org.

MOPMC Field Day at Elsberry

The PMC held a field day on September 28 after several years of not being able to hold the event. PMC field days are designed to provide NRCS and SWCD employees an opportunity to visit the Center and see what type of work is being done by staff as well as tour facilities and field activities. Ron Cordsiemon, PMC Manager, and Mollie Herget, PMC Study Leader, led a field tour of PMC study plots and seed production fields. Erin Tapley, PMC Technician, provided an overview of the farm equipment and the different seed cleaning equipment used to process seed. The field day provided a well-rounded discussion of the mission and on-going activities at the PMC.



PMC Technician, Erin Tapley, gives an overview of the seed cleaning equipment housed at the Elsberry Plant Materials Center.

Mastering Missouri Cover Crops Workshop at Elsberry

On July 26th, the PMC hosted the Mastering Missouri Cover Crops workshop in collaboration with *The Center for Regenerative Agriculture*, who sponsored and organized the event. Topics discussed included soil health impacts, cover crop species selection, seeding and termination, nutrients and herbicides, planting strategies and incentive programs. Mollie Herget, PMC Study Leader, gave a walking tour of both cool-



PMC Study Leader, Mollie Herget, leads a cover crop tour in Elsberry, MO.

season and warm-season cover crop demonstration plots. The plots were designed to demonstrate differences among cover crop species, discussing biomass production, canopy cover and flowering times. The workshop went smoothly and participants that attended received a wealth of information. The target audience for this event were local farmers and landowners interested in gaining more knowledge about selecting and using cover crops in their agriculture systems.

Water Quality and Soil Health Study Update

2022 concluded the seventh year of the long-term soil health and water quality study being conducted at the PMC in collaboration with the University of Missouri. The study compares runoff water samples and soil samples across three tillage systems: no-till with cover crops, no-till only, and conventional tillage (control). Using collection flumes at the base of each treatment field, water samples are collected during significant rainfall events. Soil samples are collected at multiple depths across multiple locations within each tillage treatment. Water and soil samples are sent to the University of Missouri for analysis and interpretation, while plant material, from both cash and cover crops, are collected and analyzed at the PMC.



Cover crop residue covers the ground between corn rows in Elsberry, MO.

Cash crop residue in April was highest in the no-till with cover crops plot (73%) and lowest in the conventional tillage plot (59%). In December, after corn had been harvested, cash crop residue was highest in the no-till with cover crops plot (79%) and lowest in the no-till only plot (68%).

In the fall, corn yield was greatest in the conventional tillage plot (123 bu/ac), followed by no-till with cover crops (107 bu/ac) and the no-till only (66 bu/ac). In April, prior to cover crop termination and planting of the cash crop (corn), total canopy cover in the no-till with cover crops averaged 67% green cover (this included cereal rye, crimson clover and canola), 28% residue and 5% bareground. Cover crops were planted in October after the cash crop was harvested.

This year, thick cover crop residue was observed in the no-till with cover crops through summer and fall. There may have been soil health issues in the no-till only that will be further investigated next year.



Black oil sunflower in Elsberry, MO.

Warm-Season Cover Crop Demonstration Plantings

Warm-season covers were planted across the PMC in May and June. Twenty-six individual cover crop species and seven mixtures were planted as a demonstration for NRCS staff and partners. Individual species demonstration plots included brassicas (Florida broadleaf mustard, impact forage collards, nitro radish, purple top turnip, trophy rapeseed), broadleaves (spineless baldy safflower, black oil sunflower, okra,

flax, buckwheat, phacelia), grasses (grazing corn, brown top millet, pearl millet, teff, sorgrow dwarf sorghum sudan, sweet forever sorghum sudan, sweet six sorghum sudan), and legumes (chickpea, guar, mung bean, red ripper cowpeas, sunn hemp, Hutchinson and derry soybeans). Mixtures included a decorative gourd mix, soil builder mix, high diversity mix, milpa food crop garden mix, summer release mix, annual wildflower mix and a flax-buckwheat mix. Individual species were planted side by side in small plots for comparison, while mixtures were planted on large acreages around the Center. The warm-season demonstration plots were toured by participants of the Mastering Missouri Cover Crops workshop as well as the PMC Field Day this summer. This was the first-time the PMC worked with warm-season conservation cover crops.

Bob Laird

In the spring of 2000, NRCS was able to work with the University of Northern Iowa to hire a part-time employee to help with the maintenance of several native seed production plots. The Iowa Ecotype Project hired several part-time employees through the years to work at the PMC, but none were more important than Bob Laird. Bob, a retired postal carrier, agreed to work at the PMC with the intentions of working no longer than 2-3 years. In September of 2022 and 22+ years later, at a youthful 90 years young, Bob decided it was time to quit working and officially retire. Bob worked on many projects and performed a variety of duties in his on-again, off-again



PMC Manager, Ron Cordsiemon, and part-time employee, Bob Laird, celebrate Laird's retirement from the Elsberry PMC.

career with NRCS and its partners. Bob has been an absolute joy to work with and be around. Many times, when Bob was laid-off from one of his projects at the PMC, he would still show up to work as an Earth Team Volunteer. Bob Laird is one of the finest individuals any person can meet, a proud American, Army and Korean War Veteran, wonderful husband to Maria and an amazing father and grandfather. Bob, THANK YOU from all of us at the Elsberry Plant Materials Center and NRCS for your dedicated service!

Seed Production of Conservation Plants

Beginning in 1952, the PMC began selecting and releasing plants to aid various conservation efforts such as erosion control, plant diversity and restoration, wildlife habitat improvement, soil enhancement and fertility, grazing and forage, among others. As of 2022, the PMC has developed over 90 conservation plant releases, with 74 of them active and approximately 35 maintained by the PMC.



Conservation plants sown in Elsberry, MO.

Plant releases in current production at the Elsberry Plant Materials Center.

<i>Species</i>	<i>Release</i>
Big Bluestem (<i>Andropogon gerardii</i>)	OZ-70 Germplasm
Big Bluestem (<i>Andropogon gerardii</i>)	Refuge Germplasm
Big Bluestem (<i>Andropogon gerardii</i>)	Rountree
Big Bluestem (<i>Andropogon gerardii</i>)	Northern Missouri Germplasm
Little Bluestem (<i>Schizachyrium scoparium</i>)	Northern Missouri Germplasm
Little Bluestem (<i>Schizachyrium scoparium</i>)	Ozark Germplasm
Switchgrass (<i>Panicum virgatum</i>)	Shawnee
Switchgrass (<i>Panicum virgatum</i>)	Cave-in-Rock
Sideoats Grama (<i>Bouteloua curtipendula</i>)	Northern Missouri Germplasm
Indiangrass (<i>Sorghastrum nutans</i>)	Rumsey
Tall Dropseed (<i>Sporobolus compositus</i>)	Northern Missouri Germplasm
Foxglove Beardstongue (<i>Penstemon digitalis</i>)	Northern Missouri Germplasm
Wild Bergamot (<i>Monarda fistulosa</i>)	Western Missouri Germplasm
Pale Purple Coneflower (<i>Echinacea pallida</i>)	Northern Missouri Germplasm
Greyhead Coneflower (<i>Ratibida pinnata</i>)	Northern Missouri Germplasm

Elsberry Plant Materials Center Recognized by National Oceanic and Atmospheric Administration

The PMC was awarded a plaque for 75 years of collecting weather data for National Oceanic and Atmospheric Administration. The PMC started collecting weather data in 1947. Many PMC staff have come and gone over the course of 75 years but maintaining the consistent weather data over that time has never wavered. Mollie Herget is currently responsible for the weather data collection and reporting.



National Oceanic and Atmospheric Administration service award.

Northern Region Little Bluestem Field Plantings and Evaluations

The PMC is working to release adapted varieties of a tested class little bluestem (*Schizachyrium scoparium*) for conservation use in Illinois, Iowa and Missouri. Selections have been proposed for the northern and southern regions of the PMC service area. The commercial release of the northern and southern (Ozark Germplasm) little bluestem selections will give landowners and operators within the Midwest region another, potentially better, option for a native grass. Conservation programs, wildlife cover and forage plantings for livestock, as well as roadside plantings and prairie restoration and enhancement projects are some uses the two releases will address.

The northern selection is in it's last phase of the release process with evaluations ongoing at the PMC and in field plantings. Field plantings were established to compare Ozark Germplasm, 'Aldous' and the northern selection of little bluestem. Aldous is a cultivar originally from the Flint Hills Prairie of Kansas. Six sites were planted; two in Missouri, three in Iowa and one in Illinois. Evaluations made in the spring and fall of



PMC Technician, Erin Tapley, evaluates *S. scoparium* at field planting.

2022 will help determine if the northern selection is superior to Aldous or Ozark Germplasm and if it warrants being released for commercial production. Field plantings are located in Linneus, MO; Albany, MO; Lake City, IA; Donnan, IA; Waterville, IA and Freeport, IL. The project has one more year of field planting evaluations scheduled.



Elsberry PMC Staff (left to right) Mollie Herget, Bob Laird, Ron Cordsiemon and Erin Tapley.

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