



Manhattan Plant Materials Center 2022 Report of Activities

The Manhattan Plant Materials Center (KSPMC) develops plants and new plant technologies for America's heartland. The Center offers services to a diverse region of the heartland including northeastern Colorado, Kansas, Nebraska, and northern Oklahoma. The Center is located on sandy loam soil in the Kansas River Valley, southwest of Manhattan, Kansas. The primary objective of the Center is to develop plant materials and technology for conservation innovation.

Plant and technology development objectives of the KSPMC include water quality and soil health improvement, wildlife and pollinator habitat improvement, erosion protection, and plant development/seed production. The Center's primary studies include work on the effects of seed quality and planting methods in native species stand establishment/enhancement, cover crop species performance, and varietal differences among cereal grain cover crops. The Center develops management and cultural techniques necessary for the establishment and acceptance of promising plant materials by the conservation community. The staff also produces limited quantities of breeder class seed and plants to stimulate commercial production of its releases.

The KSPMC has developed 30 improved conservation plants, including cultivars of big bluestem, Indiangrass, switchgrass, sideoats grama, purple prairie clover, and little bluestem.

2022

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Cover Crop Studies

Continuing the trajectory of our previous cover crop work centered around cool season grass cover crops and their phenological differences by variety, the KSPMC initiated a new study to evaluate the use of multiple phenotypes of cool season grass cover crops planted together in a blend to maximize conservation benefits in the fall and spring. Theoretically, a blend of cereal rye varieties could produce rapid establishment in the fall and continued vigorous growth in the spring. If successful, this combination would provide livestock forage in the fall while still providing soil erosion protection and weed suppression in the spring. In addition to planting this study at the KSPMC, this study was also planted at a second location 20 miles north of the KSPMC near Leonardville, Kansas. This location is situated on a Wymore silty clay loam soil, a soil that is much more representative of soils in Kansas than the sandy flood plain soils of the KSPMC. Unfortunately, the fall of 2022 was much drier than average resulting in minimal fall growth. However, moisture was sufficient for cereal rye establishment. Canopy cover, height and biomass will be collected in spring. This multi-year study will be planted in different environmental conditions to evaluate the performance and productivity of cereal rye blends.



Mixed variety plots at Leonardville, KS.

Pollinator Habitat Establishment Study

In 2022, the KSPMC entered its second year of a four-year pollinator habitat establishment method study. This study is an effort to improve the rate of success in pollinator habitat establishment. Even though this is only the second year of the study some promising results are starting to show up. Plant species included in the study are showy milkweed, plains coreopsis, purple prairie clover, Illinois bundleflower, black samson, Engelmann's daisy, dotted gayfeather, grayhead coneflower, and pitcher sage. These species were selected for the study because they are important for pollinator species and widely adapted across the KSPMC service area. The study treatments include all combinations of dormant and spring seeding period, no-till and conventional tilled seedbed preparation and drilled and surface broadcast seeding method. Replication is accomplished by planting year and weed control is consistent across treatments.



Pollinator habitat establishment treatment at the KSPMC.

The KSPMC is participating in the Rangeland Wildflower Forage Quality Project led by the Xerces Society. Purpose of the project is to collect and publish data on nutrient and mineral content of common rangeland wildflowers palatable to cattle in the Northern Great Plains and the Central Great Plains. Once the wildflower data is collected and analyzed it will be incorporated into rangeland wildflower guides to help ranchers and other land managers to recognize key wildflowers and to quantify the value wildflowers contribute to rangelands and pollinators. In 2022, the KSPMC collected samples of slimflower scurfpea, white heath aster, green antelope horn milkweed, Nuttall's sensitive-briar, blue wild indigo, compassplant silk top dalea, purple poppymallow, roundhead lespedeza, and azure blue sage.

Training Opportunities

Prescribed fire is an invaluable management tool for land managers within the service area of the KSPMC. Regular burning is one of the best management practices to control invasive tree species such as eastern red cedar in the tall grass prairie biome. Prescribed burning is also used to manage other resource concerns including forage quantity, forage quality, and vegetative community composition. As valuable as prescribed fire is to land managers and conservation planners it is not without its risks and that is why NRCS requires planners to obtain job approval authority to plan conservation practice (338) Prescribed Burning. The KSPMC plays a vital role in helping NRCS Rangeland Management Specialists and other conservation planners obtain the required job approval authority by providing a hands-on training opportunity as part of their certification process. The seed production fields and other areas of tall grass prairie vegetation at the KSPMC provide a unique opportunity to learn prescribed fire techniques and experience fire behavior in a safe and readily controlled setting. The participants leave the training with firsthand experience and the seed fields benefit from the early season weed control, increased plant vigor and nutrient cycling.



Backfire technique being taught on one of the KSPMC seed fields.



Cimmaron little bluestem being burned.

In addition to the prescribed fire training opportunity, the KSPMC hosts and/or supports several other trainings, certifications, and field days throughout the year. In-Field Soil Health Assessment, Conservation Planning, and ATV/UTV Safety training occur on a regular basis at the KSPMC. In 2022, the PMC hosted a showcase tour specifically for new NRCS employees to familiarize them with the current studies, capabilities, and resources available through the Plant Materials Program. In 2023, the KSPMC will conduct multiple sessions of Planning and Application of Vegetative Conservation Plantings Training for conservation planners.

Publications :

Early Spring Carbon to Nitrogen Ratios of Cereal Rye Varieties (13883)

<https://www.nrcs.usda.gov/plantmaterials/kspmcsr13883.pdf>



Cover crops being rolled and planted into as part of the soil health management system at the KSPMC.

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