

Establishment of Native Wildflowers into Native Warm Season Grass Pastures

Summary: Limited floral resources have contributed to pollinator habitat fragmentation and population declines. Pastures provide a unique opportunity to provide floral resources for pollinators while also supporting grazing cattle. The objectives of our studies were to evaluate native wildflower establishment, density, persistence, and flowering patterns when interseeded into switchgrass or big bluestem/indiangrass (NWSG) pastures. Over five summers, grazing regimes were either continuous, included a three-week rest during the season, or were ungrazed. Grazing regimen did not greatly affect wildflower establishment except for the exclusion of grazing, which reduced wildflower longevity over time as the tall-growing grasses outcompeted the wildflowers. Wildflowers flowered similarly within each grazing regimen, but each wildflower had varying flowering periods, with purple coneflower blooming the longest. Based on the establishment and flowering potential of the interseeded wildflowers, purple coneflower, black-eyed Susan, lanceleaf coreopsis, oxeye sunflower, and ticktrefoil are good candidates for interseeding into native grass pastures.



Weaned steers grazing NWSG pastures interseeded with native wildflowers one year following interseeding. Photo by: Jessica Prigge

Project Objectives:

- Establish native wildflowers within existing NWSG pastures.
- Evaluate wildflower density patterns within NWSG pastures over five grazing seasons.
- Quantify wildflower flowering periods within NWSG pastures.

Farmer Takeaways:

- Annuals and biennials established more quickly with most perennials establishing in years 2 and 3. Some smaller species did not establish well within NWSG. Seeding a mixture can provide more evenly distributed wildflower populations.
- All grazing regimens supported wildflower establishment and blooming ability, demonstrating grazing management flexibility when interseeding wildflowers.
- Although switchgrass pastures had greater wildflower populations initially, big bluestem/indiangrass pastures had greater persistence. Nevertheless, wildflower populations decreased in both pastures over time, though researchers noted increasing stems per plant.

Methods:

- An 11-species blend of native wildflowers was interseeded into established NWSG pastures. Each pasture was divided into paddocks that allowed each to be grazed under a systematic rest schedule: three weeks during early, middle, or late season, or excluding grazing all together.
- Weaned steers grazed the wildflower-enhanced pastures annually for five summers, and researchers documented wildflower density and blooming presence (not present, present but not flowering, present and flowering) by species within each grazing treatment.



Weaned steer chewing cud the first August following interseeding of the wildflower mixture. Photo by: Jessica Prigge

Results: Technical Findings

- Biennials like black-eyed Susan and lanceleaf coreopsis established large populations within the first two years following seeding (Figure 1).
- Perennials like Maximilian sunflower, purple coneflower, and showy ticktrefoil established slowly with greatest populations present after two and three grazing seasons.
- Large-growing perennials like Maximilian sunflower and oxeye sunflower experienced greater increases in stems per plant following the second grazing season compared to numbers of plants.
- Black-eyed Susan, purple coneflower, oxeye sunflower, and lanceleaf coreopsis flowered the most frequently (Figure 2) and purple coneflower had the longest flowering period over the summer.

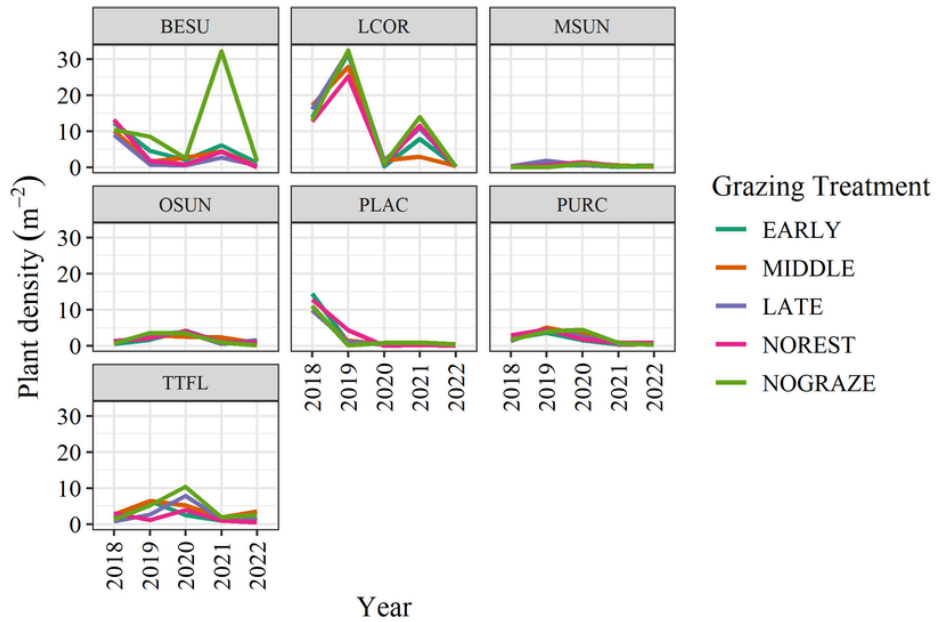


Figure 1: Wildflower* plant densities by grazing regimen, 2018 – 2022, Northeast Tennessee AgResearch and Education Center, Greeneville, TN.

*Black-eyed Susan, BESU; lanceleaf coreopsis, LCOR; Maximilian sunflower, MSUN; oxeye sunflower, OSUN; plains coreopsis, PLAC; purple coneflower, PURC; dixie ticktrefoil, TTFL; early season rest from grazing, EARLY; middle season rest from grazing, MIDDLE; late season rest from grazing, LATE; no rest from grazing, NOREST; no grazing, NOGRAZE

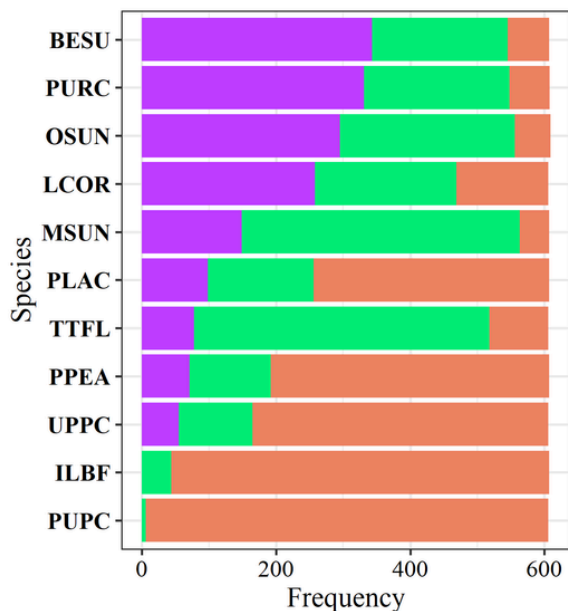


Figure 2: Frequency of observed wildflower* presence across multiple grazing regimens in NWSG pastures, 2018 – 2022, Northeast Tennessee AgResearch and Education Center, Greeneville, TN.

*Black-eyed Susan, BESU; purple coneflower, PURC; oxeye sunflower, OSUN; lanceleaf coreopsis, LCOR; Maximilian sunflower, MSUN; plains coreopsis, PLAC; dixie ticktrefoil, TTFL; partridge pea, PPEA; upright prairie coneflower, UPPC; Illinois bundleflower; purple prairie clover, PUPC.

References & More Information:

- Prigge, J.L., J.D. Richwine, E. Bisangwa and P.D. Keyser. “Interseeded native forbs resilient under variable grazing regimen.” *Land*, vol. 14, no. 5, 2025, p. 989. <https://www.mdpi.com/2073-445X/14/5/989>

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