

PLANT MATERIALS TECHNICAL NOTE

WARM-SEASON GRASSES FOR “EXTENDING THE GREEN PERIOD” IN EASTERN MONTANA

Larry Holzworth, Plant Materials Specialist, Bozeman, Montana

Abstract

The use of warm-season grasses to extend the “green period” for mid- and late-summer grazing was identified as a high priority conservation need in the Northern Great Plains. Warm-season species also have the potential to increase species’ diversity in the re-vegetation of deteriorated rangelands, mineland reclamation, and conservation practices applied through Farm Bill programs. The Wayne Berry field evaluation planting was established in May 1994 on a dryland site in east-central Montana to study the adaptation, performance, and use of warm-season grasses. Twenty-two accessions of seven warm-season grasses, plus three different mixtures of selected warm-season entries, were planted in two-acre blocks. The east end of each block was cross-seeded with *Astragalus cicer*, *Atriplex X aptera*, *Medicago sativa*, *Onobrychis viciifolia*, and *Sanguisorba minor*. All plots were monitored for plant adaptation, grazing preference and utilization, and cattle performance over nine years. The top performing entries were *Panicum virgatum*, *Andropogon hallii*, *Andropogon gerardii*, *Schizachyrium scoparium*, *Bouteloua curtipendula*, and *Bouteloua gracilis*. Results showed that the warm-season cultivars were slow to establish, but adapted to the area and that the warm-season species could increase plant diversity and provide late summer grazing. Cattle seemed to prefer and utilize the most immature entries during each late summer grazing event, regardless of cultivar type. *Andropogon gerardii*, *Bouteloua curtipendula*, and *Bouteloua gracilis* were preferred at all phenology stages and the legume mixtures increased livestock preference. As a result of this research, warm-season grasses are currently being recommended and used in Eastern Montana and Wyoming native plantings.

The results of this observational trial showed that adapted warm-season grasses and grass/legume/forb mixtures can be successfully established and managed to extend the “green period” in Eastern Montana dryland pastures. Most warm-season species are best adapted to the eastern third of Montana and Wyoming where there is some probability of summer precipitation, a longer growing season, and warmer temperatures; and where warm-season plants have been a part of the historic plant community. However, the inclusion of aggressive legumes, or even cool-season grasses, in a mixture of warm-season grasses may result in poor establishment of the warm-season grass component.

When including warm-season species in native plant mixtures, the optimum success with warm-season establishment would be exclusive warm-season species mixtures. Cool-season and warm-season grasses can be managed easier in grazing systems that consist of separate pastures of each grass type. Warm- and cool-season grasses have contrasting patterns of yield

distribution. Warm-season grasses produce more than 60 percent of their yield in mid-summer, while cool-season grasses have their greatest production in spring and fall. Cool-season grasses can be grazed in the spring and fall, and the warm-season grasses during mid-summer. If cool-season and warm-season species are mixed, they need to be established in alternate rows, as a minimum, in order to expect the establishment of a warm-season component. Research at Colstrip has proven that the most successful stand establishment of warm-season species is accomplished by establishing warm-season stands first and cross-seeding with cool-season species one year later. This would also be true for establishing legumes and shrubs within warm- or cool-season grasses. Once established, intensely managed grazing systems must be implemented in order to maintain the diverse species components.

Warm-season Grass Recommendation Summary

- Warm-season grasses require more time to establish usable plants than do cool-season grasses.
- Cool-season legumes, forbs, and grasses, and warm-season grasses, forbs, and legumes are most successfully established and managed in separate pastures.
- When mixing warm-season, cool-season grasses, legumes, forbs, or shrubs, each type establishes best when planted in separate rows, either alternated with a minimum of 12-inch spaces between rows, or in 12-inch cross-seeded rows, to allow the best opportunity for establishment of full complements of each type.
- Due to their rapid and competitive stand establishment, introduced legume seeding rates must be 0.5 Pure Live Seed (PLS) lb./acre or less, if planted together within the grass row, or planted in a separate alternate row or cross-seeded, to avoid competition to warm-season grasses.
- Little bluestem, sideoats grama, and switchgrass have successfully established minor species components when planted within the same row of cool-season species mixtures.
- Legumes and other forbs may require inter-seeding into a one year old, partially established, warm-season planting in order to create mixed species pastures.
- Grazing or haying of warm-season grasses needs to be performed early enough in mid-summer to allow an adequate re-growth prior to cool temperatures or first frost. Proper grazing management would leave a 6- to 8-inch leaf height following grazing.
- High intensity, low frequency grazing systems are a preferred grazing method, but rest or deferred rotation grazing systems are also effective for proper management of mixed stands of cool- and warm-season grasses.
- Plant with a drill equipped with an agitator, picker wheels, depth bands, and packer wheels. If a “trashy seed” drill is not available, the use of a “carrier” is encouraged to assist with seed flow and a uniform seed distribution. “De-bearded” seed is available and can be purchased to facilitate seed flow through the seed drops and eliminate the need for specialized drilling equipment.
- All species successfully established from spring planting. Cool-season species can also be successfully established from fall dormant plantings (November), but research has shown that switchgrass is the only warm-season species that can be successfully established from fall dormant planting.