TARLETON STATE UNIVERSITY
Member of The Texas A&M University System

PROJECT SUMMARY

Texas A&M University System

0-6620: Turf-Type and Early Maturing Annual Ryegrass to Establish Perennial Vegetation

Background

Annual ryegrass is used as a temporary cool-season plant on roadsides due to its rapid germination and adaptation to a wide range of soil types. It is not currently recommended by the Texas Department of Transportation (TxDOT) because its late maturity and height are too competitive for establishing subsequent permanent plant mixtures.

Two genotypes are available, which are significantly less competitive and could be seeded in the fall with fall seeded perennials and wildflowers. They are a turf-type ryegrass that was developed for sport fields and an early maturity type ryegrass that produces seed heads in winter. Both cultivars will senesce prior to germination of warm-season perennials. The objective of this research was to determine if turf-type or early maturing annual ryegrass can serve as a less competitive nurse crop for wildflowers and warm-season perennials while still producing ground cover required to reduce erosion and stabilize roadsides.

What the Researchers Did

Three commercial cultivars of annual ryegrasses were planted at two different rates (12 lb and 24 lb/acre). The three cultivars of ryegrasses were:

- Hanamiwase (early maturing annual ryegrass).
- Panterra V (turf-type annual ryegrass).
- Gulf (most widely cultivated forage annual ryegrass in Texas).

The recommended TxDOT wildflower and perennial grass/legume mix by region was planted in combination with each annual ryegrass in the fall 2010 in four zones:

- North-central represented by Stephenville.
- South-central represented by Beeville.
- North-east represented by Overton.
- South-east represented by Nacogdoches, to determine the best annual ryegrass cultivar, seeding rate, and mowing regime.

The study design was a split, randomized complete block. No irrigation was applied; the seeds relied strictly on precipitation. One mowing treatment was applied to half of all the plots in the spring. Plants were counted monthly by species. Height, percent ground cover, and plant health were also documented.

Panterra V was planted at 24 lb/acre for all plots. The wildflower and perennial grass/legume seeding rates were applied at 100 percent and 200 percent of TxDOT recommended rates by region. To determine the most effective season for planting, seven wildflower and perennial

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grass/legume treatments were sown in the fall 2010, and three treatments were sown in the spring 2011. The treatments were planted in the same zones as the annual ryegrass varieties. Plants were counted monthly by species to determine the best variety and rate for establishing desired wildflowers and perennial grass/legume mix with Panterra V as a nurse crop. Height, percent ground cover, and plant health were also documented.

Roadside implementation entailed ryegrass and seed installation at five locations across a wide swath of Texas. The sites were Bryan, Grand Saline, Hooks, Rogers, and Zephyr. These sites were planted with Hanamiwase at 6 lb/acre and 10 percent of the total wildflower and native perennial mix by weight of pure live seed by region. The control had no Hanamiwase. All plots were seeded with the TxDOT recommended wildflower and perennial grass/legume mix by region.

What They Found

The data indicated no differences among cultivars until the spring senescence. At that time, the Hanamiwase early maturing annual ryegrass plots had lower plant counts and were less dense than the Panterra V and Gulf annual ryegrasses. However, there was a difference with the seeding rate of 12 lb and 24 lb/acre with the 12 lb/acre having lower plant counts and density. Having lower Hanamiwase counts and density may have provided for less competition for the wildflower and perennial grass/legume mix. Therefore, the wildflower mix counts were higher under the lower ryegrass seeding rate. Data indicated that mowing increased annual ryegrass counts. Nonetheless, Hanamiwase showed less increase in plant counts compared to Gulf and Panterra V after mowing.

The use of Panterra V annual ryegrass created too much competition for the wildflower and perennial grass/legume mix. Panterra V provided a dense canopy that decreased sunlight penetration for wildflower and perennial grass/legume seedlings. The high density of plants may have reduced the amount of moisture for the wildflower and perennial grass/legume mix. Mature Panterra V also created a heavy mat, which reduced sunlight for perennial grasses in the spring.

There were no differences between seeding rates. However, the locations had differences in plant counts, stand heights, and ground coverage. In drier locations, the stand coverage would not protect the site from erosion at either rate.

What This Means

Hanamiwase ryegrass showed greater promise for use as a nurse crop at lower seeding rates when compared to Gulf or Panterra V. However, the seeding rates would be too low to adequately reduce erosion. In conclusion, turf-type and early maturing ryegrasses cannot be recommended as nurse crops at this time.

For More Information

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