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## PERSISTENCE OF COOL-SEASON PERENNIAL GRASSES IN EAST TEXAS

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**Background.** Production data obtained from cow-calf producers identifies costs associated with raised/purchased feed as the greatest source of variability for profit. Producers with streamlined winter feeding programs that reduce the costs of raised/purchased feed have potential for profitable operations compared with those who depend on traditional hay only, or hay and supplement feeding programs. Identification of an adapted cool-season perennial grass could help reduce costs associated with livestock winter feeding programs in parts of East Texas.

Although there are several species of cool-season forages used throughout the country, only those with persistence to survive the often hot and dry summers of Texas can be considered viable. To determine which species may have potential for use in East Texas, 22 cool-season perennial grasses were planted at TAMU-Overton during November 1999. Establishment procedures were previously reported in the Overton Research Center Technical Report, No. 2000-1. Since establishment, all plots have been periodically defoliated by mob grazing. This report addresses the initial persistence of these cool-season perennial grasses.

**Research Findings.** On April 2, 2001, 1½ years after establishment, readings were taken from all cultivars for percent stand (0-100%), stand density (1-10), and stage of maturity (1-3). Average results are presented in Table 1. Based on the 2001 evaluation for stand survival and persistence, it was obvious only tall fescue (*Festuca arundinacea*) cultivars showed potential for use in East Texas livestock production systems.

**Application.** Tall fescue is planted on more acres than any other cool-season perennial grass in the US. The presence of the traditional endophyte [(fungal organism; endo = inside, phyte = plant), *Neotyphodium coenophialum*], however, has been both good news and bad news for cattle production. On the positive side, infection by the endophyte enables tall fescue to tolerate drought, insects, disease, nematodes, and close grazing. For example, Kentucky 31 E+ was established adjacent to the plot area 25 years ago and remains intact and has actually invaded other sites. On the negative side, endophyte infection causes health problems in cattle costing the industry an estimated \$1 billion annually. In addition, horses have problems associated with foaling when grazing endophyte-infected tall fescue during the last trimester of gestation. Recently, plant breeders have isolated and included "novel" endophytes into tall fescue. These novel or friendly endophytes have been shown to provide similar persistence for tall fescue, but *not* cause the negative effects for grazing livestock. The value of the novel endophyte regarding persistence has not been well documented, however, in Texas. Additional evaluation is necessary

before recommendations can be made regarding which specific tall fescue varieties will persist in East Texas. With any tall fescue planted in East Texas, summer deferral is a critical management criterion for prolonged survival and persistence.

Table 1. Percent stand (% Stand), stand density (Density), and stage of maturity (Maturity) for cool-season perennial grasses on April 2, 2001 at Overton, TX. Values shown are means of 6 replications and 2 evaluators.

Cultivar	% Stand <sup>1</sup>	Density <sup>2</sup>	Maturity <sup>3</sup>
<b>Tall Fescue</b>			
Georgia E+ tall fescue <sup>4</sup>	94.2	8.9	1.5
Kentucky 31 E+ tall fescue	90.8	8.6	1.2
AU Triumph E- tall fescue	88.8	8.3	3.0
Georgia E- tall fescue	84.6	7.8	1.5
Jesup 584 tall fescue E+™	84.6	7.8	1.8
Jesup E- tall fescue <sup>2</sup>	83.8	7.7	1.7
Jesup 542 tall fescue E+™	81.7	7.6	1.9
Jesup E+ tall fescue	81.3	7.7	1.8
Georgia 5-542 tall fescue E+™	80.8	7.7	1.2
Kentucky 31 E- tall fescue	68.3	5.9	1.2
AGR FA 102 tall fescue E+™	24.2	2.4	1.1
<b>All Others</b>			
Virginia wildrye	15.8	2.2	1.3
Matua prairiegrass	11.3	1.3	<1.0
Lincoln smooth bromegrass	10.8	1.5	1.0
Jose' tall wheatgrass	7.5	1.2	1.0
AGR BW 101 bromegrass E+™	6.3	<1.0	<1.0
Gala bromegrass	<1.0	<1.0	N/A
Luna pubescent wheatgrass	<1.0	<1.0	N/A
Bromar mountain bromegrass	0.0	0.0	0.0
Hycrest crested wheatgrass	0.0	0.0	0.0
Newhy wheatgrass	0.0	0.0	0.0
Regar meadow bromegrass	0.0	0.0	0.0

<sup>1</sup> Percent stand is based on 0-100%.

<sup>2</sup> Stand density (Density) is based on a scale of 1-10.

<sup>3</sup> Maturity is based on a scale of 1-3 with 1 indicating no sign of reproductive growth, 2 indicating flag leaf emergence, and 3 indicating flowering.

<sup>4</sup> E+ indicates endophyte infection of the tall fescue cultivar; E- indicates no endophyte infection of the tall fescue plant; E+™ indicates cultivars infected with "novel" or friendly endophyte.