



### Report from the 2001 NTEP Tall Fescue Trial

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**Summary.** Tall fescue (*Festuca arundinacea*) is a very popular grass for lawn areas in northern Arkansas and throughout the transition zone. Identifying adapted cultivars for the region remains a central focus of the University of Arkansas turfgrass research program. The National Turfgrass Evaluation Program is the predominant means by which cultivars are tested throughout North America. A tall fescue cultivar trial was planted in the summer of 2002 at Fayetteville, Ark. Significant differences in percent cover during grow-in, turf quality, and turf color were present among the cultivars tested in Fayetteville. However, there were no differences in seedling vigor and brown patch disease incidence detected among the varieties.

Tall fescue (*Festuca arundinacea*) is one of the most popular cool-season turfgrasses in the transition zone regions of the United States, as it is widely used in lawns, sports fields and on utility turf in the region. Tall fescue is known for its superior drought tolerance, good shade tolerance, and ability to grow on poor soils. Breeding efforts in the past three decades have made tremendous strides in improving the overall quality of this species.

The National Turfgrass Evaluation Program (NTEP) is an organization within the US Dept. of Agriculture that annually oversees turfgrass cultivar evaluation experiments at various sites throughout the U.S. and Canada. Each turfgrass species is tested on a four to five year cycle at sites throughout the growing region for that particular species. The University of Arkansas has been an active participant in the NTEP and has conducted several tests on tall fescue cultivars over the past 15 years. This report will describe the establishment data and the first-year

performance data for the 2001 NTEP tall fescue trial at Fayetteville, Ark.

### Materials and methods

The cultivar experiment was planted on 20 Oct. 2001 at the University of Arkansas Research and Extension Center in Fayetteville. The plot size was 4 x 5 ft (1.2 x 1.5 m) and there were three replications of each cultivar. The cultivars were broadcast planted at a seeding rate of 4.0 lb / 1000 ft<sup>2</sup> (192 kg / ha). Plots were maintained under lawn conditions for the duration of the study. Mowing height was varied during the year, going from 1.5 in. (3.8 cm) from October until May and then raised to 2.5 in. (6.3 cm) for the summer season. Nitrogen applications consist of three applications per season with 1.0 lb N / 1000 ft<sup>2</sup> (48 kg N / ha) applied in September and May and 2.0 lb N / 1000 ft<sup>2</sup> (96 kg / ha) applied in November. Irrigation was supplied as needed to prevent stress and maintain vigorous growth. Turfgrass establishment rates of the various cultivars were determined using digital image analysis (Richardson et al., 2000). Data on monthly turfgrass quality, genetic color, and brown patch (*Rhizoctonia solani*) were assessed by visual ratings during the growing season and data on percent brown patch were collected two times in late summer using digital image analysis.

### Results and discussion

Tall fescue varieties averaged 26 percent cover and 19 days after seeding (8 Nov. 2001) and increased to an average of 95 percent cover at 46 days after seeding (5 Dec. 2001) (Table 1). On the first evaluation date, 8 Nov 2001, percent cover ranged from 10.3 to 45.1, and by the final evaluation date, 5 Dec 2001, percent cover ranged from 87.8 to 98.7. 'Watchdog' and 'Elisa' consistently ranked the lowest and highest, respectively, in percent cover during grow-in. After seeding, significant differences in percent cover among cultivars were present by 8 Nov. 2001 and 14 Nov. 2001. In the second growing season, there were no significant differences among varieties with regard to percent cover (Table 1).

Significant differences in turf quality were present among varieties on three of seven evaluation dates (16 May 2003, 11 June 2003, and 16 Sept. 2003) (Table 2). Overall quality decreased from July through October due to a significant presence of brown patch disease across the experimental area. When averaged across evaluation dates, '2<sup>nd</sup> Millennium', 'Rebel Exceda' and 'Coyote' had the best turf quality, while 'Ky-31', 'Pure Gold', and 'Titanium' had the lowest turf quality.

On 1 Oct. 2002, there were significant differences among varieties in turfgrass color (Table 3). 'Barrington' and 'Rebel Sentry' had the highest color ratings of 7.0. 'Barlexas', 'Cayenne', 'Dynasty', 'Focus', 'Legitimate', 'Quest', and 'Tomahawk RT' all had high color rating means of 6.7. 'K-31 E+' had a color rating mean of 3.3, which was significantly lower than all of the other varieties.

There were no significant differences among tall fescue varieties with regard to seedling vigor or brown patch incidence (Table 3). Across varieties, seedling vigor ratings averaged 4.7 and 6.9 on 8 Nov 2001 and 14 Nov 2001, respectively. Average brown patch incidence was 27 and 22 percent on 14 Aug. 2002 and 5 Sept. 2002, respectively.

Data will continue to be collected on these varieties throughout the 2004 growing season and will be published by NTEP.

### Literature cited

Richardson, M.D., D.E. Karcher, and L.A. Purcell. 2001. Using digital image analysis to quantify percentage turfgrass cover. *Crop Science* 41:1884-1888.

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**Table 1. Turfgrass cover means from the 2001 NTEP Tall Fescue Trial.**

Variety	Turfgrass Cover					
	Evaluation date					
	11/08/01	11/14/01	11/26/01	12/05/01	08/01/02	10/01/02
	%					
2nd Millennium	25.2	79.8	92.3	97.4	71.7	81.7
Adam's Valley	23.4	80.8	90.7	94.7	83.3	81.7
Barlexas	29.6	79.5	89.3	96.7	66.7	78.3
Barlexas II	21.6	73.6	91.3	93.8	68.3	71.7
Barrera	21.0	70.1	91.0	94.9	63.3	80.0
Barrington	32.6	80.3	93.2	96.7	63.3	65.0
Biltmore	30.4	82.6	92.0	96.7	80.0	75.0
Bingo	19.9	67.6	87.4	95.4	78.3	83.3
Bonsai	31.2	75.6	92.6	95.6	65.0	65.0
Bravo	32.3	84.7	91.4	97.9	71.7	78.3
Cayenne	39.3	79.8	90.5	97.2	78.3	76.7
Coyote	19.0	72.0	91.5	95.1	78.3	81.7
Dominion	21.3	82.1	91.8	96.0	78.3	76.7
Dynasty	28.0	85.3	91.3	97.2	50.0	83.3
Elisa	45.1	87.8	93.9	98.7	75.0	73.3
Endeavor	32.4	77.3	93.8	97.0	80.0	86.7
Falcon II	29.1	69.5	86.3	91.8	90.0	80.0
Finesse II	29.9	76.7	91.3	94.8	60.0	88.3
Focus	31.5	81.4	94.0	96.9	68.3	81.7
Grande II	23.7	69.8	87.5	93.5	73.3	90.0
Jaguar 3	39.0	81.4	92.0	97.9	75.0	78.3
Kalahari	27.5	76.4	92.4	96.6	65.0	88.3
Kitty Hawk 2000	26.6	68.3	83.4	90.2	60.0	85.0
Ky-31 E+	30.3	73.1	90.6	94.8	86.7	83.3
Lancer E	28.1	78.2	91.2	95.9	65.0	85.0
Laramie	34.2	85.0	93.4	97.8	68.3	83.3
Legitimate	27.8	81.5	91.2	96.2	80.0	80.0
Masterpiece	16.4	68.3	86.6	90.8	83.3	88.3
Matador	30.5	81.1	89.2	96.0	65.0	80.0
Millennium	25.1	70.4	87.2	94.4	86.7	85.0
Mustang 3	21.5	56.8	84.2	88.1	78.3	76.7
Olympic Gold	32.8	76.6	92.7	96.7	80.0	83.3
Picasso	17.6	60.5	74.8	88.1	86.7	83.3
Plantation	22.3	67.9	83.3	89.4	85.0	80.0
Prospect	24.6	70.9	90.1	94.8	71.7	76.7
Pure Gold	23.0	71.9	91.0	96.0	75.0	76.7
Quest	15.0	70.1	92.2	93.8	73.3	81.7
Rebel Exeda	18.1	66.5	85.5	91.3	81.7	78.3
Rebel Sentry	23.8	73.4	92.6	97.6	68.3	76.7
Rembrandt	21.8	66.3	87.3	92.7	71.7	90.0
Rendition	21.6	61.9	89.6	93.5	83.3	78.3
Scorpion	37.0	81.9	91.3	96.9	86.7	73.3
Signia	25.3	73.1	87.9	94.6	78.3	80.0
South. Choice II	37.1	74.9	86.4	94.7	78.3	85.0
SR 8250	23.2	73.5	87.5	96.1	83.3	85.0
SR 8600	35.4	83.1	92.7	96.8	85.0	83.3
Stetson	25.1	71.2	87.5	95.2	83.3	85.0
Tar Heel	24.5	79.7	91.3	96.1	81.7	80.0
Tempest	24.1	74.5	91.0	94.7	85.0	80.0
Titan Ltd.	32.1	81.0	90.3	97.2	90.0	78.3
Titanium	19.5	73.5	86.9	89.9	76.7	78.3
Tomahawk RT	25.6	71.3	86.2	93.7	80.0	75.0
Tracer	15.2	65.2	85.2	91.7	75.0	75.0
Watchdog	10.3	56.0	86.3	87.8	66.7	80.0
Wolfpack	28.8	67.3	89.5	96.8	70.0	88.3
Wyatt	25.7	74.3	92.8	97.5	80.0	83.3
LSD0.05 <sup>z</sup>	16.0	16.0	—	—	—	—
Significance	*	*	NS	NS	NS	NS

\* Significant at the 0.05 probability level.

<sup>z</sup> Fisher's protected least significant difference values at  $P = 0.05$ .

**Table 2. Turfgrass quality means from the 2001 NTEP Tall Fescue Trial.**

Variety	Turfgrass quality							Avg.
	Evaluation date							
	04/08/02	05/16/02	06/11/02	07/03/02	08/26/02	09/16/02	10/15/02	
	rating value <sup>z</sup>							
2 <sup>nd</sup> Millennium	6.3	6.3	6.7	5.7	4.3	4.3	4.3	5.4
Adam's Valley	5.7	6.7	6.7	5.0	3.0	3.3	3.2	4.8
Barlexas	4.7	5.3	5.7	5.3	4.0	3.0	3.5	4.5
Barlexas II	5.7	6.3	6.7	4.7	3.0	3.0	3.0	4.6
Barrera	5.3	6.0	6.7	5.7	4.0	4.0	4.0	5.1
Barrington	5.3	5.7	5.7	4.7	3.3	2.7	3.0	4.3
Biltmore	5.3	5.3	6.0	5.7	4.0	3.7	3.8	4.8
Bingo	5.0	5.7	6.7	5.3	3.7	4.0	3.8	4.9
Bonsai	3.0	3.3	3.7	4.0	3.0	2.0	2.5	3.1
Bravo	6.0	5.7	5.3	5.3	3.7	3.7	3.7	4.8
Cayenne	5.3	6.3	6.3	5.3	3.3	3.7	3.5	4.8
Coyote	5.7	6.3	6.3	5.7	4.3	4.3	4.3	5.3
Dominion	4.7	5.3	5.3	5.3	4.7	3.0	3.8	4.6
Dynasty	4.3	5.7	5.7	5.7	3.7	3.7	3.7	4.6
Elisa	4.3	4.7	4.7	5.0	2.7	2.3	2.5	3.7
Endeavor	5.0	5.0	5.0	4.7	4.7	4.3	4.5	4.7
Falcon II	4.7	5.0	4.7	5.0	5.0	4.0	4.5	4.7
Finesse II	5.7	6.3	6.7	5.7	3.0	3.7	3.3	4.9
Focus	5.3	5.7	5.7	5.7	4.0	4.0	4.0	4.9
Grande II	5.3	6.0	6.7	5.3	4.0	4.3	4.2	5.1
Jaguar 3	5.7	5.3	5.7	4.7	3.7	3.3	3.5	4.5
Kalahari	5.3	6.0	5.3	6.0	3.3	5.0	4.2	5.0
Kitty Hawk 2000	4.3	4.7	5.0	4.7	4.0	3.7	3.8	4.3
Ky-31 E+	3.0	2.7	3.0	3.7	3.3	2.3	2.8	3.0
Lancer E	5.0	4.7	5.3	5.0	3.7	4.0	3.8	4.5
Laramie	5.0	6.0	5.3	5.0	3.3	3.3	3.3	4.5
Legitimate	4.7	5.3	6.0	4.7	4.0	3.3	3.7	4.5
Masterpiece	5.0	5.3	5.3	5.7	4.7	4.7	4.7	5.0
Matador	4.7	5.3	6.3	5.0	3.7	3.3	3.5	4.5
Millennium	5.7	6.0	6.3	6.0	4.3	3.7	4.0	5.1
Mustang 3	4.7	5.7	5.7	5.7	4.7	4.7	4.7	5.1
Olympic Gold	4.7	4.7	5.7	5.3	4.3	4.3	4.3	4.8
Picasso	4.7	5.0	5.7	5.0	4.3	4.7	4.5	4.8
Plantation	5.3	5.7	6.0	5.7	5.0	4.0	4.5	5.2
Prospect	5.0	5.0	5.7	4.3	3.3	3.3	3.3	4.3
Pure Gold	4.7	5.0	5.7	4.0	3.0	2.3	2.7	3.9
Quest	5.0	6.0	6.3	5.3	3.7	4.0	3.8	4.9
Rebel Exeda	5.3	6.0	6.0	5.7	4.3	5.3	4.8	5.4
Rebel Sentry	5.3	6.3	6.0	5.3	3.7	4.0	3.8	4.9
Rembrandt	5.0	5.3	6.0	6.3	3.7	4.0	3.8	4.9
Rendition	5.7	6.3	5.7	5.7	3.3	3.3	3.3	4.8
Scorpion	4.7	5.3	4.7	5.0	3.7	3.7	3.7	4.4
Signia	4.7	5.0	5.7	5.0	4.7	4.7	4.7	4.9
South. Choice II	5.0	6.0	6.0	6.0	4.0	3.3	3.7	4.9
SR 8250	6.0	6.3	6.3	5.0	4.3	3.7	4.0	5.1
SR 8600	5.3	6.0	6.3	5.7	3.3	3.7	3.5	4.8
Stetson	4.7	4.3	4.3	5.0	3.7	2.7	3.2	4.0
Tar Heel	5.0	5.0	5.7	6.0	4.0	3.7	3.8	4.7
Tempest	5.0	5.3	6.3	4.7	4.3	4.3	4.3	4.9
Titan Ltd.	4.7	3.7	4.0	4.3	3.3	2.7	3.0	3.7
Titanium	4.3	4.7	5.7	6.0	4.0	4.3	4.2	4.7
Tomahawk RT	5.7	6.0	6.0	6.3	3.3	2.7	3.0	4.7
Tracer	5.0	5.7	6.7	6.0	3.7	3.3	3.5	4.8
Watchdog	4.0	5.0	5.7	5.3	3.7	4.0	3.8	4.5
Wolfpack	5.3	5.7	6.0	6.0	4.0	4.0	4.0	5.0
Wyatt	5.7	5.0	5.3	5.7	3.7	3.0	3.3	4.5
LSD0.05 <sup>y</sup>	NS	1.6	1.6	NS	NS	1.6	NS	0.7
Significance	—	***	***	—	—	**	—	***

\*\* , \*\*\* Significant at the 0.01 and 0.001 probability levels, respectively.

<sup>z</sup> Quality was rated on a scale of 1 to 9 (6 equals minimum acceptable quality).

<sup>y</sup> Fisher's protected least significant difference values at  $P = 0.05$ .

**Table 3. Seedling vigor, brown patch incidence, and turf color means from the 2001 NTEP Tall Fescue Trial.**

Variety	Seedling vigor		Brown patch incidence				Turf color
			Evaluation date				
	11/08/01	11/14/01	08/14/02	09/05/02	10/01/02		
	Rating <sup>z</sup>	Rating <sup>z</sup>	Percent	Rating <sup>y</sup>	Percent	Rating	Rating <sup>x</sup>
2 <sup>nd</sup> Millennium	4.7	7.7	30.8	3.7	20.7	2.7	6.0
Adam's Valley	4.3	7.3	19.0	2.3	21.4	2.3	5.3
Barlexas	5.0	7.3	36.4	4.0	24.5	3.0	6.3
Barlexas II	4.0	6.7	33.0	3.7	30.9	3.3	6.7
Barrera	4.0	6.7	38.8	4.3	21.7	2.7	6.0
Barrington	5.3	7.7	39.9	4.7	36.5	4.0	7.0
Biltmore	5.0	7.7	22.9	2.7	26.5	3.3	6.3
Bingo	4.0	6.0	24.9	3.0	18.8	2.3	6.0
Bonsai	5.3	7.3	36.7	4.3	36.5	4.3	6.0
Bravo	5.3	8.0	30.6	3.7	23.4	3.0	6.3
Cayenne	6.0	7.3	23.9	3.0	25.6	3.3	6.7
Coyote	4.0	6.7	25.0	3.0	20.4	2.7	6.3
Dominion	4.3	7.7	24.7	3.0	25.8	3.0	6.0
Dynasty	4.7	8.0	53.3	5.7	19.2	2.3	6.7
Elisa	6.3	8.0	28.1	3.3	28.7	3.3	5.0
Endeavor	5.3	7.3	23.2	2.7	16.8	2.0	6.0
Falcon II	4.7	6.3	11.9	2.0	22.0	2.7	6.0
Finesse II	5.0	7.0	42.3	4.7	14.4	2.0	5.7
Focus	5.3	7.7	34.4	4.0	22.0	2.7	6.7
Grande II	4.3	6.3	29.3	3.3	11.4	1.7	6.3
Jaguar 3	5.7	7.3	27.7	3.3	25.1	3.0	6.3
Kalahari	5.0	7.0	37.8	4.3	13.5	2.0	5.3
Kitty Hawk 2000	4.7	6.3	42.1	4.7	17.7	2.3	5.7
Ky-31 E+	5.3	7.0	15.9	2.0	18.4	2.3	3.3
Lancer E	5.0	7.3	37.1	4.3	18.1	2.0	5.7
Laramie	5.7	8.0	35.1	4.0	18.7	2.3	5.3
Legitimate	4.7	7.7	22.0	2.7	22.5	2.7	6.7
Masterpiece	3.7	6.3	19.4	2.3	13.8	2.0	5.0
Matador	5.0	7.3	38.0	4.3	23.3	2.7	6.0
Millennium	4.7	6.3	16.0	2.0	18.5	2.3	6.3
Mustang 3	4.3	5.0	23.3	3.0	27.2	3.0	6.3
Olympic Gold	5.3	7.0	22.2	3.0	20.0	2.7	5.7
Picasso	4.0	5.3	16.0	2.0	20.7	2.3	6.0
Plantation	4.3	6.3	18.3	2.3	22.1	2.7	6.3
Prospect	4.3	6.3	32.1	3.3	27.8	3.0	5.7
Pure Gold	4.3	6.3	26.4	3.0	24.2	3.0	6.0
Quest	3.3	6.3	29.1	3.7	22.1	2.7	6.7
Rebel Exeda	3.7	6.0	20.9	2.7	23.4	3.0	6.3
Rebel Sentry	4.3	7.0	34.5	3.7	24.2	3.0	7.0
Rembrandt	4.3	6.0	31.9	3.3	13.1	1.7	5.7
Rendition	4.0	5.7	20.1	2.3	22.7	3.0	6.0
Scorpion	5.7	7.7	15.5	2.0	30.1	3.3	6.3
Signia	4.7	7.0	24.2	3.0	21.8	2.7	6.0
South. Choice II	5.3	7.0	25.3	3.0	17.9	2.0	5.7
SR 8250	4.3	6.7	18.5	2.3	17.9	2.3	5.3
SR 8600	5.7	7.7	17.9	2.3	19.7	2.3	6.3
Stetson	4.7	6.7	20.0	2.3	16.7	2.3	6.3
Tar Heel	4.3	7.7	20.2	2.7	21.8	3.0	5.7
Tempest	4.0	7.0	18.4	2.3	21.8	2.7	5.7
Titan Ltd.	5.3	7.7	12.0	2.0	22.4	3.0	6.3
Titanium	4.0	6.7	26.4	3.0	25.4	3.0	6.3
Tomahawk RT	4.3	6.7	21.5	2.7	27.5	3.3	6.7
Tracer	3.7	6.0	26.6	3.3	26.5	3.3	6.0
Watchdog	2.7	5.3	35.4	4.0	24.0	2.7	5.3
Wolfpack	5.0	6.3	32.1	3.7	14.9	2.0	5.3
Wyatt	4.7	6.7	23.5	2.7	19.1	2.3	6.0
LSD0.05 <sup>w</sup>	NS	NS	NS	NS	NS	NS	1.0
Significance	—	—	—	—	—	—	***

\*\* \*\*\* Significant at the 0.01 and 0.001 probability levels, respectively.

<sup>z</sup> Seedling vigor was rated on a scale of 1 to 9.

<sup>y</sup> Brown patch incidence was rated on a scale of 1 to 9 (9 = severe, 1 = none).

<sup>x</sup> Turf color was rated on a scale of 1 to 9 (9 = ideal dark green color, 1 = brown).

<sup>w</sup> Fisher's protected least significant difference values at  $P = 0.05$ .