

Field Evaluation of Roundup Ready® Kentucky Bluegrass

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Introduction

Demand for genetically modified crops has seen an increase in popularity. Along with the benefits modified crops provide, there are some concerns of their ecological impact. The objectives of the Roundup Ready® bluegrass study were to establish conventional cultivars of Kentucky bluegrass, tissue culture–regenerated genotypes from conventional cultivars and transformed lines (glyphosate resistant) of Kentucky bluegrass in order to evaluate their vegetative and reproductive traits. Assessing these traits will allow us to determine if the transformed plants pose an ecological threat. All lines will be studied in a mown, competitive as well as a nonmown, noncompetitive setting. Once established, comparisons of plant characteristics will be made for both the mown and nonmown settings. Seed characteristics and production will also be evaluated for the nonmown setting.

Materials and Methods

The study included 18 different genotypes obtained from The Scotts Company in the form of plugs. There were 11 conventional cultivars, 3 tissue culture regenerated lines, and 4 transformed lines (Table 1). The studies were conducted as randomized complete blocks with 4 replications each. With 18 treatments and 4 replications, this was a total of 72 treatment plots in this study. Creeping red fescue was seeded over the plot of the mown, competitive plots to simulate competition between the two species. All plots were established in the fall 2003. Maintenance was provided for the mown and nonmown plots. The competitive plots were kept at a mowing height between 2.5 and 3 in. Incidences of grassy or broadleaf weeds were controlled with appropriate herbicides. In

addition, incidence of disease was controlled with the proper fungicides. Data were collected the following two growing seasons and the study termination was fall 2005.

Monthly data collection began at the beginning of each growing season and ended once the growing season was over. Vigor and competitiveness of the cultivars were evaluated at the end of each month during the growing season by measuring traits related to vegetative encroachment and colony area. Colony quality components were evaluated by rating each colony's color retention, disease, insect susceptibility, and unusual or unexpected growth or color. The aforementioned data were collected on both the nonmown and mown plots.

Additional data were collected for the nonmown, noncompetitive plots. The vegetative and botanical characteristics examined included panicle length, flag leaf length, width, and sheath length, spikelets per panicle, ligule type, and internode length. Flowering characteristics measured included date of inflorescence emergence, inflorescence density, dates of anthesis initiation and cessation, and maturity date. Lastly, seed production data were taken. The seed production data included clean seed weight, weight of 100 seed, and total number of seedheads/plant colony.

Results and Discussion

Data is currently being analyzed and will be made available by spring 2006. Selective data of vegetative encroachment, the mean length of the four longest rhizomes in each of a four-quadrat grid (one measurement/quadrat), for the 2005 nonmown plots have been analyzed (Table 1.) Seed production data is currently being analyzed and will be made available when the analysis is completed. All data will be used for comparison purposes to evaluate the three categories of genotypes.

Table 1. Vegetative encroachment data of longest rhizome means (cm) for nonmown plots of bluegrass during 2005 growing season.

Genotype/Cultivar	May	June	July	August	September
Tx01-2862	24.8	25.8	27.8	31.5	31.8
Midnight	35.5	36.0	41.3	44.5	46.0
Touchdown	40.5	49.5	53.8	57.5	59.5
Texas Bluegrass	34.3	36.8	37.0	38.8	40.3
02080S HB-130	44.0	48.0	51.0	56.8	58.5
Abbey	37.5	43.3	44.0	44.5	44.8
Bx01-5609	7.3	8.5	9.3	7.5	8.5
Tx01-2875	32.0	38.0	39.3	42.3	43.8
Tx01-2900	37.8	39.5	43.3	46.5	47.8
021128c HB-130	47.3	54.0	54.3	60.8	62.5
Limousine	28.0	32.0	35.0	37.3	31.0
Unique	36.8	40.0	45.3	45.0	44.0
Ascot	39.8	43.5	46.5	48.0	48.8
HB-129	46.5	55.5	58.0	62.8	62.8
South Dakota	44.5	53.3	55.5	61.8	63.0
010607c Unique	35.5	38.8	41.0	41.5	41.8
HB-329	37.3	41.8	44.5	46.5	44.8
HB-130	53.8	60.3	64.0	68.0	72.0
LSD (0.05)	11.1	12.8	12.3	13.1	15.8