

November 2009 report

Project Title: Fairway Conversion to Low-Mow Kentucky Bluegrass Using Annual Bluegrass Herbicides Combined with Turf Seeding Time and Rate

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Introduction:

Fairways make up the largest high quality turf area on the golf course. The Superintendent and General Manager need proven strategies and reasonable expectations for success before they are willing to take the risk of converting to improved grasses. Low-mow Kentucky bluegrass varieties have already proven themselves in many trials related to stress performance and playability; their performance as a mature stand of grass is not in question. Instead, the uncertainty involves the ability to make a successful conversion without having the fairway overrun with annual bluegrass. Our research evaluates seeding dates, seeding rates, and herbicide treatments that are aimed at eliminating annual bluegrass invasion so that Kentucky bluegrass can be successfully established in golf course fairways.

Objectives:

1. To determine specific herbicide and seeding strategies that can be used to successfully convert existing cool season grass fairways to improved low-mow Kentucky bluegrass varieties with minimal annual bluegrass infestation.
2. To determine the most cost effective strategy for converting existing cool season fairways to the new generation of improved low-mow Kentucky bluegrass varieties.

Results:

Progress and results since the May 1, 2009 report

All treatments have been applied according to the study proposal. Areas seeded in 2007 and 2008 were evaluated during the summer of 2009 and retreated in October 2009 according to the study proposal. Table 1 shows that Tenacity applied in the fall to an establishing stand of Kentucky bluegrass and annual bluegrass (seeded in August or September) resulted in approximately 40% Kentucky bluegrass ground cover by the first November after seeding and 93% Kentucky bluegrass cover a year later in November 2008. Table 2 shows data from the 2008 establishment year that are similar to the 2007 establishment year (Table 1). Data from both establishment years indicates that only 40 to 50% Kentucky bluegrass turf cover was achieved by November of the establishment year. However, by the following spring and summer turf cover of Kentucky bluegrass increased to over 90%. Although not within the scope of this study it appears that nitrogen fertility needs to be maximized during the fall of the establishment year to speed turf cover from the rather slow to establish low mow Kentucky bluegrass varieties. Other research we are conducting indicates that a minimum of 4 lbs N/1000 will benefit rapid establishment during fall establishment.

Here are some of the additional observations after two years of data collection.

- The September and August seeding date resulted in better Kentucky bluegrass establishment than the June seeding date.
- Increasing the seeding rate from 2.5 to 5.0 lbs/1000 sq.ft. had no impact on Kentucky bluegrass establishment.
- No turf phytotoxicity was observed with Tenacity.

- Annual bluegrass cover was reduced from 90% cover in the non-treated control plots to 50% annual bluegrass cover in the Pendulum treated plots.
- One year after establishing Kentucky bluegrass those plots treated with Tenacity maintained at least 90% Kentucky bluegrass cover and did not revert back to a heavy infestation of annual bluegrass.
- The small amount of residual annual bluegrass, approximately 5 to 10%, can be kept in check by annual applications of Tenacity applied in October. Even though the new low mow Kentucky bluegrass varieties provide a uniform and dense stand of grass, it appears that annual bluegrass herbicides will still be necessary to keep this difficult weed from dominating Kentucky bluegrass fairways.

Research initiated since May 2009 and its status

- The entire study areas initiated in 2007 were continued in 2008 and final observations were made in July 2009.
- The entire study areas initiated in 2008 were continued in 2009 and data collection will continue through July 2010.
- The study area initiated in 2008 was retreated with annual bluegrass herbicide treatments in October 2009.

Research to be implemented between November 1 2009 and May 1, 2010.

- The plots established in 2008 were retreated in October 2009 and will be evaluated through July 2010.

Describe any challenges that you have encountered since November 1 that may necessitate major changes in this research. If major changes are required, describe the revised research plan in detail.

- There were no major changes in the study.

Table 1. Percent cover of Kentucky bluegrass, annual bluegrass, and bare soil in 2007 and 2008 when seeded in 2007 and treated with Tenacity or Pendulum in October 2007 and 2008. Data were combined over two Iowa test locations, Twin Pines Golf Course in Cedar Rapids and Homewood Golf Course in Ames.

		Nov, 2007			May, 2008			July, 2008			Nov, 2008			May, 2009			July, 2009		
Seeding Date	Treatment	%KB	%AB	%BS	%KB	%AB	%BS	%KB	%AB	%BS	%KB	%AB	%BS	%KB	%AB	%BS	%KB	%AB	%BS
June 2007	Tenacity	41.7	58.3	0.0	82.5	12.5	5.0	85.8	14.2	0.0	93.3	0.0	6.7	93.3	0.0	6.7	95.0	3.3	1.7
	Pendulum	22.5	77.5	0.0	18.3	79.2	2.5	39.2	60.8	0.0	43.3	56.7	0.0	43.3	56.7	0.0	47.5	52.5	0.0
	Control	21.2	78.8	0.0	5.8	94.2	0.0	15.8	84.2	0.0	18.3	81.7	0.0	18.3	81.7	0.0	15.0	85.0	0.0
	LSD_{0.05}	12.0	13.3	NS	21.8	22.6	5.2	13.3	13.3	NS	13.6	16.5	NS	13.6	16.5	NS	12.6	12.4	NS
Aug 2007	Tenacity	39.2	60.8	0.0	74.2	20.8	5.0	96.3	3.7	0.0	97.5	0.0	2.5	97.5	0.0	2.5	97.5	1.7	0.8
	Pendulum	20.0	80.0	0.0	17.5	82.5	0.0	50.0	50.0	0.0	52.5	39.2	8.3	52.5	39.2	8.3	56.7	43.3	0.0
	Control	20.0	80.0	0.0	20.0	80.0	0.0	12.7	87.3	0.0	8.3	91.7	0.0	8.3	91.7	0.0	5.8	94.2	0.0
	LSD_{0.05}	12.0	13.3	NS	21.8	22.6	5.2	13.3	13.3	NS	13.6	16.5	NS	13.6	16.5	NS	12.6	12.4	NS
Sept 2007	Tenacity	54.1	26.7	19.2	85.0	3.2	11.8	97.2	2.8	0.0	95.0	0.0	5.0	95.0	0.0	5.0	95.8	2.5	1.7
	Pendulum	34.2	54.2	11.6	27.8	70.0	2.2	48.3	51.7	0.0	48.3	50.0	1.7	48.3	50.0	1.7	53.3	46.7	0.0
	Control	30.8	65.0	4.2	8.3	91.7	0.0	9.2	90.8	0.0	6.7	93.3	0.0	6.7	93.3	0.0	5.8	94.2	0.0
	LSD_{0.05}	12.0	13.3	4.7	21.8	22.6	5.2	13.3	13.3	NS	13.6	16.5	NS	13.6	16.5	NS	12.6	12.4	NS

Table 2. Percent cover of Kentucky bluegrass (KB), annual bluegrass (AB), and bare soil (BS) for fairway conversion plots seeded in June, Aug., and Sept. 2008. Means represent whole plot estimates averaged over six replicates at two golf courses, Jewell G&CC in Jewell, IA and Twin Pines in Cedar Rapids, IA. Means were separated by Fisher's Least Significant Difference ($\alpha = 0.05$) and were adjusted using Tukey's adjustment for multiple comparisons.

Seeding		Nov, 2008			May-09			Jul-09		
Date	Treatment	%KB	%AB	%BS	%KB	%AB	%BS	%KB	%AB	%BS
June 2008	Tenacity	57.5	1.7	40.8	59.2	23.3	17.5	52.5	47.5	0.0
	Pendulum	16.7	76.7	6.7	20.0	68.3	11.7	22.5	77.5	0.0
	Control	8.3	87.5	4.2	2.5	95.0	2.5	4.5	95.5	0.0
	LSD_{0.05}	19.4	15.4	13.6	18.1	25.5	13.3	24.1	24.1	NS
Aug 2008	Tenacity	72.5	0.0	27.5	83.3	2.5	14.2	92.5	7.5	0.0
	Pendulum	18.3	81.7	0.0	33.3	66.7	0.0	28.3	71.7	0.0
	Control	12.5	86.7	0.8	8.3	90.8	0.9	12.8	87.2	0.0
	LSD_{0.05}	19.4	15.4	13.6	18.1	25.5	13.3	24.1	24.1	NS
Sept 2008	Tenacity	66.7	0.0	33.3	73.3	1.7	25.0	92.3	7.7	0.0
	Pendulum	27.5	59.2	13.3	35.0	60.8	4.2	43.3	56.7	0.0
	Control	18.3	75.8	5.8	12.5	83.3	4.2	18.2	81.8	0.0
	LSD_{0.05}	19.4	15.4	13.6	18.1	25.5	13.3	24.1	24.1	NS

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