

Effects of Trinexapac Ethyl on Sod Production - 1996

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The impact of the growth regulator, Trinexapac ethyl, on sod production and post-harvest establishment was assessed. This study was conducted at the Iowa State University Horticulture Research Station north of Ames, Iowa. The experimental plot was 'Vantage' Kentucky bluegrass. The soil in this area was a Nicollet (fine-loamy, mixed, mesic Aquic Hapludoll) with 3.6% organic matter, a pH of 7.0, 2 ppm P, and 85 ppm K.

The experiment was designed as a randomized complete block. There were four replications with 5 x 5 ft. individual plots and no barrier rows between replications. There were three Primo 1EC treatment regimes and an untreated control. All applications were made at 0.75 oz/1000 ft² (the label rate for Kentucky bluegrass). Primo was applied two weeks prior to sod harvest, two weeks after sod establishment, and both two weeks prior and two weeks after (Table 1). A carbon dioxide backpack sprayer equipped with #8006 nozzles at 20-25 psi was used to apply the Primo 1EC.

On June 4, the 'two weeks before sod cutting' treatments were applied. On June 19, the turf on the entire experimental plot was cut using a sod cutter. The sod had approximately 1.5 - 2.0 in. of soil/root mass. Sod pieces were transplanted into 12 x 12 in. wooden frames. A piece of sod the size of the outside diameter of the frame was cut and the frames were placed into the resulting hole so that the frames were flush with the soil surface. The sod piece was then trimmed to fit inside the frame. The frames had 18 mesh fiberglass screen bottoms so the roots could grow through. The frames were placed back into the experimental plots so the sod would establish. Four frames were used in each plot, one in each of four quadrants. One frame from each plot was randomly chosen and 'pulled' on each of four data collection dates. The plot was watered thoroughly upon completion and watered as needed to prevent the sod from drying.

On July 3, the 'two weeks after sod establishment' treatments were made and the first set of sod frames were sampled. Steel cables attached to a special hydraulic sod pulling apparatus were attached to screw hooks placed on each side of the frames. Pressure was applied to the lifting apparatus and the frames were 'pulled'. The tensile strength required to pull the roots from the soil was measured in foot pounds and recorded on a gauge. The remaining three sets of frames were harvested at 2-week intervals on July 19, July 31, and August 15.

Turf quality was assessed using a 9 to 1 scale: 9 = best quality, 6 = lowest acceptable quality, and 1 = poorest quality. Visual quality data were taken on July 3, July 19, July 25, July 31, and August 15 (Table 1). Sod establishment and root 'knitting' were measured as tensile strength in foot pounds using a hydraulic sod pulling apparatus (Table 2).

Data were analyzed using the Statistical Analysis System (SAS) version 6.09 and the Analysis of Variance (ANOVA) procedure. Means were compared with Fisher's Least Significant Difference test (LSD).

Significant differences in turf quality were found on July 25 and August 15. The untreated controls and bluegrass treated with Primo two weeks before sod cutting (treatment 2) had significantly better mean quality than turf treated with Primo two weeks after sod cutting and turf treated two weeks before and after cutting.

On July 3, the tensile strength of sod treated with Primo two weeks before sod cutting was significantly higher than the untreated controls and sod treated with Primo two weeks after establishment (Table 3). On July 19, the tensile strengths were similar for treated and untreated sod. On July 31, the strengths were not significantly different and were almost equal for sod treated with Primo two weeks before, sod treated two weeks before and after, and untreated sod. On August 15, sod treated with Primo two weeks before and after had significantly higher tensile strength than the other treated and untreated sod.

Table 1. Visual quality¹ of Kentucky bluegrass sod growing in frames in the 1996 Primo Sod Production Study.

Materials	Rate [oz product]	Timing of application	Tensile strength (PSI)					Mean quality
			July 3	July 19	July 25	July 31	Aug. 15	
1. Untreated control	NA	NA	7	7	8	7	6	7
2. Primo 1EC	0.75	2 wks before	7	7	8	7	7	7
3. Primo 1EC	0.75	2 wks after	7	6	6	6	6	6
4. Primo 1EC	0.75	2 wks before & 2 wks after	7	6	6	6	7	6
LSD _{0.05}			NA	NA	0.5	NA	0.4	0.1

Two weeks prior to sod cutting treatments were applied June 4. Sod was cut and put into frames on June 19. Two weeks after sod establishment treatments were applied July 3.

¹ Visual quality was assessed using a 9 to 1 scale: 9 = best quality, 6 = lowest acceptable quality, and 1 = poorest quality.

NA = LSD test not applicable because there is no mean square error (no variance among reps).

Table 2. Root tensile strength and knitting of Kentucky bluegrass sod growing in frames in the 1996 Primo Sod Production Study measured by the number of pounds (PSI) required to pull 1 ft² frames.

Materials	Rate [oz product]	Timing of application	Tensile strength (PSI)				Mean strength
			July 3	July 19	July 31	Aug 15	
1. Untreated control	NA	NA	146	273	335	274	257
2. Primo 1EC	0.75	2 wks before	188	271	333	333	281
3. Primo 1EC	0.75	2 wks after	129	243	263	303	234
4. Primo 1EC	0.75	2 wks before & 2 wks after	178	280	320	460	309
LSD _{0.05}			40	NS	NS	133	NS

Two weeks prior to sod cutting treatments were applied June 4. Sod was cut and put into frames on June 19. Two weeks after sod establishment treatments were applied July 3.

NS = means are not significantly different at the 0.05 level.