EVALUATING MOWING AND FERTILIZER PRACTICES FOR RE-ESTABLISHMENT OF SPORTS FIELDS IN A 70 DAY GROWING WINDOW

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Introduction

There are over 10,000 sports fields in the state of Michigan on which thousands participate annually (Rogers 2002, personal communication). These sports fields serve a variety of functions, from hosting sporting events to sites of community gatherings. The sports field complex is a vehicle for physical and mental well being in society. At a minimum, these sports fields should be safe and playable. The major issue is that a high majority of these sports fields are overused and abused, and this problem is compounded by these sports fields having inadequate funding for routine maintenance and turfgrass reestablishment. Ultimately, the goal is to educate decision makers on the inputs required to maintain these sports fields. In the meantime, research practices must be explored to reduce costs, and increase the turn around time for a sports field to be ready for play again. For the Michigan sports field manager, the windows of opportunity to reestablish turfgrass are quite limited due to either use or climate. The need to cost-effectively evaluate rapid, timely establishment procedures, specifically for sports fields, is crucial for long term success.

Objectives

If a sports field manager has only 70 days to get a sports field ready, what is the quickest way to re-establish these high traffic areas if there is minimal to zero turfgrass cover? This study will evaluate mowing and fertility regimes for re-establishment of sports fields in a short growing window during the summer. For this discussion, we will use shear resistance as an indicator of plant fitness for before and during traffic regimes for the first season of data.

Materials & Methods

The design of the experiment was a two factor study with three replications (Table 1). Different mowing and fertility treatments were evaluated. This study was conducted at the Hancock Turfgrass Research Center (HTRC) on the campus of Michigan State University in East Lansing, MI. Due to other experiments taken place on these plots in the last ten years, Basamid was used to sterilize the soil. Seeding and fertilizer treatments commenced on May 31. A 30:70 sports grass mixture of perennial ryegrass (Lolium perenne var. SR4400, SR4500 and Manhattan III) and Kentucky bluegrass (Poa pratensis var. Champagne and Rugby II) was seeded at a 4#/1000ft^2 rate. Starter fertilizer (13-25-12) 1# N/1000ft^2 rate was applied as well as subsequent fertilizer treatments. Germination blankets were placed over the top of the seeded and fertilized

treatments on 31 May and removed after 12 days. During the 70 day establishment phase, all nutrients were maintained at adequate levels. A three week traffic regime commenced 12 August to 30 August. An 18-9-18 fertilizer at 0.5# N/1000ft^2 rate was applied on 6 August and 20 August to boost nutrient supplies during the traffic phase. At this point of the experiment, shear resistance values will be discussed and represent a common trend seen in other data taken.

Table 1. Individual treatments for the mowing and fertilizer study.

Factor A	**Mowing – (2x/week)**
	1) **Low** – Mow at 1.5" throughout the study
	2) **Intermediate** – Mow at 3.0" for 40 days and slowly drop the height to 1.5"
	3**) High** – Mow at 3.0" and chop to 1.5"on day 68
Factor B	**Fertilizer – (13-25-12 starter fertilizer @ 1.0# N/M for the first application on June 1)**
	1) 46-0-0 – July 1 @ 1# N/M – **Urea**
	2) 46-0-0 – 0.33# N/M every 2 weeks – **Urea 2w**
	3) 39-0-0 – SCU @ 3# N/M – **SCU**
	4) 43-0-0 – Polyon @ 2# N/M (0.1# N/wk) – **Poly 2**
	5) 43-0-0 – Polyon @ 3# N/M (0.2# N/wk) – **Poly 3**
	6) 44-0-0 – Polyon @ 4# N/M (0.4# N/wk) – **Poly 4**

Take Home Message

Shear resistance values were not significant among mowing regimes (Table 2). Shear resistance values, however, were significant among fertility treatments for every date except on 23 August and 4 September (non-trafficked) (Table 2). Although values were not incredibly high for shear resistance (20 N m and higher), Poly 2 and Poly 3 seem to be the most consistent throughout the establishment and traffic phases of the experiment. All the fertilizers were put down the same day as the seed except for the urea treatments. Even though, other nutrients were supplemented, technology provides the opportunity to make many more nutrients slow release as well. Even though the up front cost of the bags will be higher, the turfgrass manger does not have to re-apply anymore fertilizer during this establishment phase. Again shear resistance values of the Poly 2 and Poly 3 treatments indicate a better plant fitness versus the other treatments.

References

Rogers, J.N., III. 2002. Personal communication. Michigan State University.

Table 2. Effects of mowing regimes and fertility treatments on shear resistance values (N m) on a trafficked and non-trafficked perennial ryegrass/Kentucky bluegrass stand at the HTRC, 2002.

	11 Jul[1]	24 Jul[2]	2 Aug[3]	15 Aug[4]	23 Aug	4 Sept		4 Sept
								No Traffic
	----- Shear resistance values (N m) -----							
Mowing								
Low	15.8	17.5	15.6	16.1	12.7	11.4		25.1
Intermediate*	16.7	17.8	14.7	16.4	11.9	10.9		24.6
High	17.1	17.6	15.2	15.5	12.1	10.7		24.6
LSD (0.05)	NS	NS	NS	NS	NS	NS		NS
Fertilty Trts.								
Urea	14.0	16.7	14.8	15.6	11.8	10.7		19.3
Urea 2w	15.3	16.6	14.2	16.1	11.7	10.3		15.4
SCU	16.4	17.2	13.9	15.1	11.5	10.1		35.1
Poly 2	18.9	18.5	16.7	17.9	13.4	11.7		21.1
Poly 3	18.4	19.4	18.1	17.4	13.4	12.3		29.4
Poly 4	16.3	17.5	13.4	13.9	11.7	11.1		28.3
LSD (0.05)	1.7	1.8	2.3	1.7	NS	1.3		NS
Games Simulated	0	0	0	3	6	10		

NS – not significant

1 – Low treatment mowed at 1.5" for the rest of expt. and Intermediate and High mowed at 3"

2 – Intermediate mowed at 2" and High mowed at 3".

3 – Intermediate mowed at 1.5" and High mowed at 3"

4 – All the treatments were being mowed at 1.5" on 8 Aug