# Optimizing Seeding Dates for Autumn and Spring Renovation of Football Fields

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Intensely trafficked areas of athletic fields require routine seeding to reestablish grass and reduce the amount of exposed soil. It is important to maintain sufficient biomass/thatch/mat to reduce mud and compaction problems that develop when soil becomes exposed on the surface (Minner, 2004). Autumn, spring, and summer seeding schedules have been recommended for turf reestablishment (Minner, 2005). Dormant seeding is a practice that is often used when renovating football fields at the end of the playing season in November. Seeding in September usually germinates but the survivability of seedlings under traffic is not known. Seeding in October may or may not produce fall germinated plants. It is not know if seed planted in October germinates and dies in the autumn, germinates in the autumn and continues to grow in the spring, or remains as dormant seed in the autumn and germinates in the following spring.

**Objective**
To determine effective renovation seeding dates and turfgrass species that optimize turf cover for football activities.

**Methods**
This study was established on a Nicollet (fine-loamy, mixed, mesic Aquic Hapludoll) soil with 4.0% organic matter at the Horticulture Research Farm in Ames, Iowa USA, on 26 Sep 2003 and on 1 Oct 2004. Three species of turfgrass, Kentucky bluegrass KB (*Poa pratensis* L.), perennial ryegrass PR (*Lollium perenne* L.) and tall fescue TF (*Festuca arundinacea* L.) were used in the study. Seeding for year 1 occurred on 26 Sep, 3 Oct, 10 Oct, 17 Oct, 31 Oct, 14 Nov, and 28 Nov 2003 and 22 Apr, 13 May, and 3 Jun 2004. Year 2 seeding dates were 1 Oct, 15 Oct, 27 Oct, 15 Nov, 29 Nov 2004, and 15 Apr, 15 May, and 15 Jun of 2005. The experimental design was a randomized complete block with 3 replications and 2 factors (species and seeding dates). Seeding rates were 2 lb/1000 $ft^2$ of KB and 10 lb/1000 $ft^2$ of PR and TF.

Turf cover was evaluated before each seeding and on 29 Jun of 2004 and 12 Jul 2005. This is the second year of data, first year was reported previously. The data were analyzed using PROC ANOVA of the SAS software, Version 8 of the SAS System for Windows (SAS Institute, 1999). Means were separated ($\alpha = 0.05$) by Fischer's protected LSD.

Results Year 1, Fall 2003 – Spring 2004
On 28 Nov 2003 perennial ryegrass and tall fescue produced considerably more turf cover (42-65% cover) than Kentucky bluegrass (10% cover) when all three grasses were seeded on 26 Sept. 2003. Ryegrass and fescue provide faster and more complete coverage of the ground when fall seeded. Dormant seeding on 28 Nov 2003 did provide substantial turf cover (approximately 70% cover) for all three species by the following 29 June observation date. This indicates that autumn dormant seeding can be a successful method for increasing turf cover in the following summer. The 17 Oct seeding date produced the least amount of turf cover by the following summer on 29 June. This indicates that the least effective time to seed may be in Mid-October since it resulted in the lowest turf cover the following season. Even though this may be the least effective time to seed it did result in 33% to 57% turf cover by the following summer, and that may justify seeding through out the entire autumn football season.

Results Year 2, Fall 2004 – Spring 2005
At the end of the autumn establishment period, 29 Nov 2004, PR had more turf cover than TF or KB and TF had more turf cover than KB. By the following spring, 15 Apr 2005, PR still had more cover than TF or KB for autumn seeding date. However, by the end of spring TF had more turf (60% cover) than KB (40% cover). The 12 July 2005 evaluation date gives a good indication of the amount of turf cover on the fields just prior to two-a-day practices in July as well as giving a good comparison of all of the seeding dates from Oct through June. Turf cover was best (80-92% cover) when KB was seeded from 1-27 Oct or on 15 May. Seeding on 15 and 27 Nov would be considered a "dormant seeding" and this resulted in 63% and 50% turf cover. The dormant seeding did produce turf cover greater than 50% before the next playing season so it did provide some increase in turf cover, however it was less than the earlier and more dependable seeding times in October. The 15 May seeding in 2005 had much better cover than the Apr seeding only a month earlier.

The response for TF was similar to KB in that there was a period in the autumn and spring when seeding resulted in lower turf cover the following year. For TF seeding dates of 27 Oct 2004 and 15 Apr 2005 had less turf cover.

Autumn and spring seeding dates had less influence on the amount of turfgrass cover that would result just prior to the following summer football practice season in July.

**Summary**

- Autumn dormant seeding of KB, PR, and TF can be used to increase turf cover for the following football season.
- The seeding period from 15 – 30 Oct typically had the least amount of turf cover by the following season and this period should be avoided if dormant seeding is a goal.

**Table 1**. Percent cover of Kentucky bluegrass, perennial ryegrass and tall fescue observed during Fall 2003 and Spring 2004.

| | 17-Oct | 28-Nov | 22-Apr | 29-Jun |
|---|---|---|---|---|
| | | Cover (%) | | |
| **Seeding date** | | | | |
| | | **Kentucky bluegrass** | | |
| **26-Sep** | 8.3 | 10.0 | 10.0 | 68.3 |
| **3-Oct** | 3.7 | 1.7 | 2.3 | 70.0 |
| **10-Oct** | 0.0 | 0.0 | 1.0 | 78.3 |
| **17-Oct** | | 0.0 | 2.0 | 33.3 |
| **31-Oct** | | 0.0 | 3.0 | 60.0 |
| **14-Nov** | | 0.0 | 3.0 | 66.7 |
| **28-Nov** | | | 1.3 | 68.3 |
| **22-Apr** | | | | 83.3 |
| **13-May** | | | | 65.0 |
| **3-Jun** | | | | 70.0 |
| | | **Perennial ryegrass** | | |
| **26-Sep** | 32.7 | 65.0 | 83.3 | 83.3 |
| **3-Oct** | 20.0 | 26.7 | 21.7 | 75.0 |
| **10-Oct** | 0.0 | 1.0 | 1.3 | 70.0 |
| **17-Oct** | | 0.0 | 1.3 | 50.0 |
| **31-Oct** | | 0.0 | 1.3 | 60.0 |
| **14-Nov** | | 0.0 | 2.3 | 71.7 |
| **28-Nov** | | | 1.7 | 70.0 |
| **22-Apr** | | | | 81.7 |
| **13-May** | | | | 80.0 |
| **3-Jun** | | | | 70.0 |
| | | **Tall fescue** | | |
| **26-Sep** | 21.7 | 41.7 | 45.0 | 63.3 |
| **3-Oct** | 15.0 | 13.3 | 10.0 | 78.3 |
| **10-Oct** | 0.0 | 0.0 | 2.0 | 90.0 |
| **17-Oct** | | 0.0 | 3.7 | 56.7 |
| **31-Oct** | | 0.0 | 2.7 | 63.3 |
| **14-Nov** | | 0.0 | 2.3 | 71.7 |
| **28-Nov** | | | 2.0 | 70.0 |
| **22-Apr** | | | | 86.7 |
| **13-May** | | | | 51.7 |
| **3-Jun** | | | | 68.3 |
| **LSD $_{0.05}$** | 3.5 | 4.4 | 5.5 | 16.2 |

**Table 2**. Percent cover of Kentucky bluegrass, perennial ryegrass and tall fescue observed during Fall 2004 and Spring 2005.

| | 15-Oct | 29-Nov | 15-Apr | 12-Jul |
|---|---|---|---|---|
| | | Cover (%) | | |
| **Seeding date** | | | | |
| | | **Kentucky bluegrass** | | |
| **1-Oct** | 2.0 | 11.7 | 40.0 | 91.7 |
| **15-Oct** | | 8.3 | 33.3 | 88.3 |
| **27-Oct** | | 3.3 | 13.3 | 80.0 |
| **15-Nov** | | 0.0 | 4.3 | 63.3 |
| **29-Nov** | | | 1.7 | 50.0 |
| **15-Apr** | | | | 40.0 |
| **15-May** | | | | 85.0 |
| **15-Jun** | | | | 3.3 |
| | | **Perennial ryegrass** | | |
| **1-Oct** | 16.7 | 48.3 | 80.0 | 88.3 |
| **15-Oct** | | 51.7 | 86.7 | 93.3 |
| **27-Oct** | | 23.3 | 66.7 | 88.3 |
| **15-Nov** | | 15.0 | 40.0 | 83.3 |
| **29-Nov** | | | 18.3 | 90.0 |
| **15-Apr** | | | | 85.0 |
| **15-May** | | | | 81.6 |
| **15-Jun** | | | | 75.0 |
| | | **Tall fescue** | | |
| **1-Oct** | 7.7 | 25.0 | 60.0 | 88.3 |
| **15-Oct** | | 10.0 | 28.3 | 81.7 |
| **27-Oct** | | 7.7 | 11.7 | 58.3 |
| **15-Nov** | | 2.3 | 8.3 | 81.7 |
| **29-Nov** | | | 5.0 | 81.7 |
| **15-Apr** | | | | 56.7 |
| **15-May** | | | | 81.7 |
| **15-Jun** | | | | 21.3 |
| **$LSD_{0.05}$** | 6.7 | 3.0 | 4.6 | 8.1 |

**Literature cited**

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