

MANAGEMENT FACTORS AFFECTING ANNUAL BLUEGRASS/CREEPING BENTGRASS COMPETITION

Roch Gaussoin and Bruce Branham

Field studies were initiated in 1984 to investigate different management factors and their effects on annual bluegrass/creeping bentgrass competition. Two field studies are involved. One study is investigating 5 management factors, irrigation rate and frequency, clipping removal, nitrogen fertility level, plant growth regulator treatment and bentgrass overseeding. The second study involves the same irrigation and clipping removal treatments as study one plus compaction and core cultivation treatments. Description of these treatments are shown in Table 1.

The intent of this research is to outline which of these management practices, either singly or in combination with the other management factors, favor annual bluegrass or creeping bentgrass. Ideally, this research would allow a turf manager to decide which practices he can employ, in a cost effective manner, to maintain the desired species.

Results of the 5 management study, after two years of data collection, indicate that N-fertility and clipping removal have a significant effect on the species composition of the mixed stand. Plots where clippings were removed, regardless of any other treatments applied, showed a 14.2% decrease in annual bluegrass, while plots where clippings were returned showed a 6.5% decrease in annual bluegrass, indicating that clipping removal favors the decrease of annual bluegrass. The high N treatment showed a 8.4% decrease in annual bluegrass while in the low N treatment annual bluegrass was decreased by 12.2% indicating that high N fertilization favors annual bluegrass. The treatment combination which showed the greatest decrease (22.8%) in annual bluegrass was the low irrigation plots where clippings were removed and low N-fertility employed.

The compaction/coring study results indicated that plots receiving compaction treatments showed a 9.6% increase in annual bluegrass, while the non-compacted plots showed a 5.4% decrease in annual bluegrass. No significant population shift was attributable to core cultivation treatments.

Data from both studies is summarized in Table 2.

TABLE 1. Treatment list of factors in annual bluegrass/creeping bentgrass competition studies. Hancock Turfgrass Research Center, Michigan State University.

Treatment	Rate	Application Date(s)
Irrigation:		
High	110% OPE*	3x/Week
Med	75% OPE*	Daily
Low	-	At wilt
N-Fertility:		
High	6#N/M/YR	1#/Month in May-Sept. 1# in Nov
Low	2#N/M/YR	1/2#/Month in June, July, Sept, Nov
Plant Growth Regulator:		
Embark	0.125#/AC	Spring
Cutless	1.0#/AC	Spring
Control	-	-
Clipping Removal:		
Returned	-	At each mowing
Removed	-	At each mowing
Overseeding:		
overseeded	1#/M/YR	Mid-August
not overseeded	-	-
Compaction:		
Compacted	3x/Week with water ballast roller	
Non-compacted	-	-
Coring:		
Normal	VOHT**	Spring
Intense	VOHT	Spring, Summer, Fall
Control	-	-

* OPE = Open Pan Evaporation

** VOHT = Vertically Operated Hollow Tine

TABLE 2. Summary of significant effects in annual bluegrass/creeping bentgrass competition studies. Values shown represent percent change in annual bluegrass populations.

Five Management Factors Study

Clippings removed	-14.2
Clippings returned	-6.5
2 lbs/N/M/YR	-12.2
6 lbs/N/M/YR	-8.4

IRRIGATION

	<u>Daily</u>		<u>3x/Week</u>		<u>Wilt</u>	
	C+*	C-*	C+	C-	C+	C-
2 lbs/N/M/YR	-12.9	-13.5	-2.8	-11.4	-10.1	-22.8
6 lbs/N/M/YR	-1.9	-12.8	-1.4	-11.1	-10.0	-13.4

Compaction and Coring Study

Compaction	+9.6
No Compaction	-5.4

IRRIGATION

	<u>Daily</u>	<u>3w/Week</u>	<u>Wilt</u>
Clippings removed	-0.4	-10.7	9.4
Clippings returned	+3.3	+5.3	5.8

*C+ = Clippings returned
 C- = Clippings removed