

**NAME OF TEST:** The influence of management practices on seed production of introduced bluestems, 1961.

**OBJECTIVES:** To develop practices which would improve seed yield and quality of selected perennial grasses.

**EXPERIMENTAL PROCEDURE:**

Location: Agronomy Farm, College Station, Texas

Soil type: Lufkin fine sandy loam

Establishment practices: Plant material was established vegetatively in 40" rows in the spring of 1961. Cultivation and irrigation was used as necessary for establishment. In mid-August, Pretoria 90 was about 36 inches high with some indication of booting. Medio had produced a complete ground cover by this date but was entirely vegetative with no upright stems.

Mowing and fertilization: Pretoria 90 was mowed to stubble heights of 2, 6 and 24 inches on August 18 and a check plot was left unmowed. Medio was not mowed because of inadequate upright growth. Each clipping treatment, or similar size area on Medio, was split into two sub-plots, one receiving 40-40-40 fertilizer on August 19 and the other no fertilizer.

Irrigation and rainfall: Three main blocks with the above combination of clipping and fertilization were irrigated as follows: (1) No irrigation (2) irrigation as needed to maintain growth until the plants reached the heading stage and (3) irrigation as needed until harvest. All plots were irrigated on August 19 following the fertilizer application. Rains in excess of 7.5 inches occurred on September 9-12 and about 1 inch on October 1 and 2. Plots which were to receive irrigation were irrigated on September 26 and October 14.

**RESULTS:** Pretoria 90 with 2 and 6-inch mowing heights showed good booting starting September 20 with inflorescence emergence starting September 25. Sparse heading was noted on plots with 24-inch mowing height starting October 11. Non-clipped Pretoria plots and Medio were in full boot on October 14 with some Medio heads emerging by October 17. Inflorescence counts were made on all Pretoria 90 clipped plots on October 17 and 10 days later on unclipped plots. Pretoria 90 was harvested October 25-30 and Medio on November 10.

Results of inflorescence counts, seed yield and percent seed set determinations are presented in Tables 1 and 2. The main effects of clipping, irrigation and fertilizer on inflorescence production were significant at the 1 percent level. The effect of clipping treatments on seed was highly significant. The effects of fertilizer on seed production approached significance. Irrigation practice had a highly significant effect on seed quality of Pretoria 90. Neither irrigation nor fertilizer significantly influenced Medio seed production or quality. Clipping treatments were not used with this grass.

**DISCUSSION:** Established stands of Pretoria 90 and Medio bluestem frequently fail to mature fall seed crops because of delayed emergence of inflorescences. The plants appear to initiate floral production but development of the inflorescence is very slow and also emergence from the boot. Unclipped Pretoria 90 behaved according to this pattern in

## DISCUSSION CONTINUED:

1961. Not only was floral production delayed to the point that seed did not mature, but the number of inflorescences on unclipped plants was significantly less than on clipped plants. Severe clipping resulted in significantly better seed yield and quality than mild clipping consisting of removing only about 12 inches of the tops.

Natural rainfall appeared to be adequate for seed production of these grasses in the fall of 1961. The soil in this block is thin and tends to be droughty. The upper or more droughty end was used for the non-irrigated plots in order to facilitate irrigation. The plants appeared to be in need of water at times; yet, Pretoria 90 without irrigation produced significantly more seed stems and as much seed as with irrigation. Pretoria 90 seed set with irrigation discontinued at the heading stage was better than either continuous irrigation or no irrigation. Medio seed set was significantly better without irrigation.

Fertilization improved inflorescence production of Pretoria 90 and this was reflected to some extent in seed yield. Seed quality was not influenced by fertilization of either grass.

These were first-year stands of both grasses and response patterns may not be the same as in perennial years. A second-year stand of Pretoria 90 in another test produced about 90 pounds of seed with 8 percent seed set. Medio in the same test produced only 80 pounds with 10 percent seed set. Thus, it is apparent that Medio behaved differently in the two test areas. Medio seed yields and seed quality were excellent in this test. However, if maturity had been delayed 10 days, quality would have been considerably reduced and this apparently occurred in the second-year test.

The effects of irrigation will be influenced by weather conditions. Also, response to clipping and fertilization may be different in a full growing season. Thus, it will be necessary to repeat the test in 1962.

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Table 1. The influence of clipping management, irrigation practice and fertilization on seed production of Pretoria 90 bluestem. College Station, Texas.

Clipping height	No irrigation		Irrigated to heading stage		Continuous irrigation		Average		
	No 40-40-40 fertilizer	No 40-40-40 fertilizer	No 40-40-40 fertilizer	No 40-40-40 fertilizer	No 40-40-40 fertilizer	No 40-40-40 fertilizer	Fert.	Fert.	Avg.
Number of seed stems per row foot									
2"	36	30	20	24	18	18	25	24	24
6"	33	26	29	27	22	18	28	24	27
24"	46	24	33	21	31	27	37	24	30
Not clipped	25	23	16	11	27	22	23	19	21
Average	35	26	25	21	25	21	28	23	
Irrigation Avg.	30		23		23				
Pounds of seed material per acre									
2"	194	158	173	155	141	168	169	160	165
6"	192	186	179	129	133	161	168	159	163
24"	136	86	176	67	87	93	133	82	108
Average	174	143	176	117	120	141	157	133	
Irrigation Avg.	158		147		131				
% Seed set									
2"	7	15	13	11	7	15	9	14	11
6"	16	9	20	15	5	9	14	11	12
24"	12	7	15	7	7	5	11	6	9
Average	12	10	16	11	6	10	11	10	
Irrigation Avg.	11		14		8				

Table 2. The influence of irrigation and fertilization on seed production of Medio bluestem, College Station, 1961.

Irrigation practice	Fertilization		Average
	40-40-40	No fertilizer	
	Pounds of seed per acre		
No irrigation	190	186	188
Irrigated to heading	199	199	199
Continuous irrigation	195	239	217
Average	195	208	
	% Seed set		
No irrigation	40	51	46
Irrigated to heading	30	25	28
Continuous irrigation	27	25	26
Average	32	34	