

Forage Research in Texas

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Department of Soil and Crop Sciences

Project: H-6457

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Location: College Station

RATE OF LEAF ELONGATION IN KLEINGRASS

OBJECTIVE:

To determine whether individual kleingrass plants differ in rate of leaf elongation as an indication of plant vigor.

PROCEDURE:

Plants were cut uniformly with hand shears to a height of 15 mm on August 18. The cut collar of mature leaves which showed no further elongation was used as a base or reference. Amount of elongation of the first elongating leaf in the whorl was determined by measuring the distance (mm) between the tip of the elongating leaf and the end of the mature leaf cut at harvest. Five leaves per plant were measured on 96 individual plants (non-replicated) on day 11 and 12 following cutting. The data were converted to mm elongation/day.

RESULTS:

Leaf elongation rates ranged from 19 mm/day to 46 mm/day among the plants. We evaluated from 3 to 7 individual plants of 5 plant introductions. Mean daily elongation rates of the PI accessions varied only from 30 mm to 38 mm while the mean of all plant introductions was 32 mm. Approximately 70 progeny in the first cycle of phenotypic recurrent selection for seed weight also were measured. The mean daily elongation rate of these progeny was 34 mm. These values indicate that selection for increased weight in kleingrass has not reduced plant vigor.

Horst et al. (Horst, G. L., C. J. Nelson, and K. H. Asay. Crop Sci. 18:715-719 - 1978) reported the use of leaf elongation as an indication of yield potential of tall fescue. They found a significant correlation between leaf elongation in the first 16 days following cutting to subsequent dry matter yield of individual replicated plants of tall fescue. A two to three fold difference was recorded among plants in elongation rate. If their 16-day elongations under irrigation were converted to a daily rate, the maximum rate recorded was 16 mm. They also reported a high heritability for leaf elongation.

The rate of elongation of the plant showing maximum rate (46 mm/day) was about 2.4 time that of the plant with the minimum rate (19 mm). This is in the same range as for tall fescue reported by Horst et al. The actual elongation values are somewhat greater for kleingrass. Though the genotypes were not replicated in this preliminary study, the results seem to fit the pattern described for tall fescue and suggest differences in vigor in kleingrass populations.

Table 1 - Rate of leaf elongation of selected kleingrass plants.

Identification ¹	Mean Elongation mm/Day	Identification ¹	Mean Elongation mm/Day
410179 - 3-4	27	410176 - 10-18	35
3-6	31	D5 - 29- 4	39
3-16	34	11	33
3-17	40	18	27
3-18	27	20	24
410175 - 5-4	27	21	26
5-5	39	30- 3	35
5-6	28	22	34
5-8	32	39	32
5-12	38	31-10	28
5-14	29	32-21	31
5-18	31	33- 4	31
410179 - 7-1	20	15	31
7-3	27	16	27
7-10	29	29	31
7-14	37	34-10	26
7-17	26	11	28
7-20	37	39	30
410178 - 9-6	39	35-20	33
9-9	41	36-17	30
9-11	33	24	29
410176 - 10-2	34	37- 7	39
10-11	32	38- 5	24
10-12	31	39-20	34

¹ PI or block followed by row and plant no.

Table 1 Cont'd.

Identification ¹	Mean Elongation mm/Day	Identification ¹	Mean Elongation mm/Day
D5 - 4-26	32	D5 - 58-15	43
41-16	21	60-22	46
24	36	29	36
42-24	28	61-10	28
43-22	28	21	40
44-11	27	62-25	43
45-13	29	63-17	43
20	31	66- 4	33
46- 8	32	9	41
19	38	20	46
31	30	25	38
47-25	19	68-20	42
48-10	31	69-19	34
18	29	70- 2	33
49-12	29	71- 9	43
25	34	14	37
51- 9	37	23	39
52-13	35	30	36
25	37	73- 6	41
53- 6	29	75-13	32
55- 6	43	77- 5	40
23	40	21	34
56- 3	36	78-34	36
57- 7	33	82-28	34

¹ PI or block followed by row and plant no.