PERFORMANCE OF BERSEEM, *TRIFOLIUM ALEXANDRINUM* VARIETIES FOR GREEN FODDER YIELD POTENTIAL

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ABSTRACT

Ten varieties of berseem and a check were evaluated during rabi season of 2004-05 at Fodder Research Sub-station, Ayub Agricultural Research Institute, Faisalabad. Significant differences were observed for plant height, number of tillers per square meter, number of leaves per tiller and green fodder yield. The variety Superlate Faisalabad was the tallest variety (64.07 cm) closely followed by Anmol Berseem (64.06 cm) while Local D.I. Khan was the shortest (58.40 cm). Number of tillers varied from 102 (Local Sheikhupura) to 150 per square meter (Anmol Berseem) while number of leaves per tiller ranged from 9.80 (Local D.I. Khan) to 12.60 (Anmol Berseem). Higher green fodder yield (100.44 t/ha) was produced by variety Anmol Berseem followed by Superlate Faisalabad (91.78 t/ha), S-03-02 (90.89 t/ha), Faisalabad Late-1 (90.22 t/ha) and S-03-01 (87.77 t/ha). Check variety Pachaiti Berseem was 61.97 cm tall and produced 120 tillers per square meter with 11.80 leaves per tiller and green fodder yield of 78.22 tons per hectare.

KEYWORDS: *Trifolium alexandrinum;* high yielding varieties; performance; agronomic characters; Pakistan.

INTRODUCTION

Berseem *(Trifolium alexandrinum* L.) is an important winter fodder crop of irrigated areas of Pakistan. It is a multicut crop which produces nutritious and paletable fodder for the cattle. Fodder yield of berseem is low in Pakistan because of the low yield potential of varieties being grown by the farmers. Hence high fodder yielding varieties of berseem are required to be developed to overcome this problem.

Mehta *et al.* (8) found significant differences for fodder yield among different varieties of berseem. Gupta and Pardhan (4) reported variation in fodder yield

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amongst various berseem cultivars. Yadav *et al.* (12) noted that plant characters like height, leafiness and tillering had positive influence on green fodder yield potential of berseem varieties. Sidha and Mehndiratta (10) studied factors influencing forage yield in berseem. They noted that berseem varieties producing more tillers and leaves also produced high green fodder yields. Hussain *et al.* (6) reported significant differences in behaviour of different berseem varieties regarding their chemical composition and fodder yield potential. Gupta *et al.* (5) found that newly improved berseem varieties produced higher fodder yield due to more resistant to diseases as compared to old varieties. Beri and Sohoo (1,2) analysed yield components in berseem varieties and concluded that number of tillers per square meter was a major yield factor. In addition to this, number of leaves per plant was also a yield contributing factor. Chaudhry *et al*. (3) studied the performance of different berseem varieties. They found significant differences for number of tillers, leaves per plant and green fodder yield. Plant height ranged from 62.91 to 76.65 cm while number of tillers varied from 162.60 to 187.20 per square meter. Green fodder yield ranged from 114.98 to 136.74 tons per hectare . They concluded that higher fodder yields in berseem varieties could not be attributed to the stimulation of any particular yield component but was due to positive contribution of a combination of yield components like number of tillers and number of leaves per plant with additional contribution by plant height. Munir (9) reported that cutting intervals of 20 and 25 days significantly decreased the incidence of root rot disease in berseem crop and increased the green fodder yield.

The present study was conducted to identify high green fodder yielding varieties of berseem.

MATERIALS AND METHODS

Ten varieties of berseem (Anmol Berseem, Superlate Faisalabad, S-03-02, Faisalabad Late-1, S-03-01, Local Rawalpindi, Peshawari, Sindhi, Local D.I. Khan and Local Sheikhupura) were planted on 8.12.2004 alongwith check variety (Pachaiti Berseem) at Fodder Research Sub-Station, Ayub Agricultural Research Institute, Faisalabad. The experiment was conducted in RCBD with three replications. The sowing was carried out by broadcasting the seed in standing water @ 25 kg per hectare in plots measuring 3 x 5 meter. At the time of planting, fertilizer was applied @ 25-125-0 kg NPK per hectare. Five cuttings were done from 6.1.2005 to 16.5.2005. Fifteen irrigations were applied during the entire period of crop growth. At the time of each cutting, data on plant height, number of tillers per square meter, number of leaves per tiller and green fodder yield were recorded.

The data recroded were statistically analysed using analysis of variance technique and treatment means were compared by using least significant differences at 5 percent probability (11).

RESULTS AND DISCUSSION

Significant differences were observed for plant height, number of tillers, number of leaves and green fodder yield amongst the berseem varieties (Table 1,2).

Table1. Mean plant height, number of tillers, number of leaves and green fodder yield of different varieties of Berseem.

Variety	Plant height (cm)	No.of tillers/m^2	No. of leaves/ tiller	Green fodder yield (t/ha)
Anmol Berseem	64.06a	150.00a	12.60a	100.44a
Superlate Faisalabad	64.07a	140.00b	12.47a	91.78b
S-03-02	62.50abc	139.33b	11.93bc	90.89b
Faisalabad Late-1	63.4ab	138.33b	12.07b	90.22b
S-03-01	61.67c	133.00b	11.60de	87.77b
Pachaiti Berseem (check)	61.97bc	120.00c	11.80cd	78.22c
Local Rawalpindi	61.00cd	119.00c	11.40c	78.00c
Peshawari	59.17e	107.00d	10.60f	70.67d
Sindhi	59.80de	105.33d	10.40f	67.11de
Local D.I. Khan	58.40e	103.00d	9.80g	64.22de
Local Sheikhupura	59.8 de	102.00d	10.00g	63.56e
LSD (5%)	1.69	7.19	0.25	4.97
CV (%)	1.95	4.14	1.58	4.39

Any two means not sharing a letter differ significantly at 5% level of probability.

Table 2. Source of variation, degree of freedom and mean squares of different traits of berseem varieties.

Source of variation	Degree of freedom	Plant height	No.of tillers/m^2	No. of leaves/tiller	Green fodder yield
Replications	2	5.46**	166.46**	0.09	36.53
Varieties	10	11.71**	915.76**	2.89**	485.82**
Error	20	1.44	26.06	0.03	12.43

*P≤0.05, **P≤0.01

The variety Superlate Faisalabad produced taller plants (64.07 cm) closely followed by Anmol Berseem (64.06 cm). Faisalabad Late-1 ranked third (63.40 cm) followed by S-03-02 (62.50 cm). All these four varieties were statistically at par with each other in plant height. The check variety Pachaiti Berseem was 61.97 cm tall while S-03-01 attained plant height of 61.67 cm.

The variety Local D.I. Khan was the shortest (58.4 cm). Number of tillers ranged from 102 (Local Sheikhupura) to 150 per square meter (Anmol Berseem). Superlate Faisalabad ranked second (140 tillers/m^2) followed by S-03-02 (139.33 tillers/m^2), Faisalabad Late-1 (138.33 tillers/m^2) and check Pachaiti Berseem (120 tillers/m^2). Varieties Superlate Faisalabad, S-03-02, Faisalabad Late-1 and S-03-01 did not differ statistically in terms of tillers. Variety Anmol Berseem produced maximum number of leaves per tiller (12.60) followed by Superlate Faisalabad (12.47), Faisalabad Late-1 (12.07), S-03-02 (11.93), check Pachaiti Brseem (11.80) and S-03-01 (11.60). Local D.I. Khan produced minimum number of leaves per tiller (9.8). Variety Anmol Berseem also ranked first in green fodder yield (100.44 t/ha). Variety Superlate Faisalabad (91.78 t/ha) ranked second followed by S-03-02 (90.89 t/ha), Faislabad Late-1 (90.22 t/ha) and S-03-01 (87.77 t/ha). The varieties Superlate Faisalabad, S-03-02, Faisalabad Late-1 and S-03-01 did not differ statistically with each other in terms of green fodder yield potential but produced significantly higher yield than check Pachaiti Berseem (78.22 t/ha). Local Sheikhupura produced minimum green fodder yield (63.56 t/ha).

The varieties Anmol Berseem, Superlate Faisalabad, S-03-02, Faisalabad Late-1 and S-03-01 significantly performed better than all other varieties including check Pachaiti Berseem. These varieties not only produced higher green fodder yield but also had taller plants and more number of tillers and leaves. Previous researchers (1, 2, 3, 5, 10, 12) also found that higher green fodder yielding varieties of berseem also possessed superior plant traits.

On the basis of performance, Anmol Berseem, Superlate Faisalabad, S-03-02, Faisalabad Late-1 and S–03-01 could be considered for general cultivation.

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