Performance of Guinea Grass Varieties in North Konkan Zone of Maharashtra

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Introduction

Guinea grass (*Panicum maximum*) is native to Africa but this grass was introduced to almost all tropical countries as a source of animal forage. It grows well on a wide variety of well drained soils of good fertility and it is suitable to stop soil erosion. It can survive quick moving fires which does not harm the underground roots and drought because of the deep, dense and fibrous root system. Guinea grass is a colonizer of disturbed sites, including roadsides, and particularly untended areas. This robust grass forms clumps and may foster soil erosion in invaded areas. Guinea grass is a perennial crop and may form quite large clumps. Commonly found at around 1.5 m tall, some individuals have recorded at 3 m tall. The leaf blades are long, narrow and finely tipped. They have a prominent mid-rib and are approximately 1 cm wide. Seed heads are large (up to 40 cm long) and are well-spread, with a large number of fine branches. Seeds are oblong in shape and are often purple in colour. Keeping the above context in view, the present investigation was carried out for studying the performance of Guinea grass varieties in north konkan zone of Maharashtra.

Materials and Methods

A field experiment was conducted at Agricultural research station, Palghar during *Kharif* seasons of 2012 to study the performance of Guinea grass varieties in north zone of Maharashtra. The experiment consisted of eight varieties *viz*., JHGG-081, RSDGG-2, JHGG-08-2, PGG-710, PGG-702, PGG729, PGG-616 (NC) and Bundel Guinea-1 (NC) which were compared with local check Riversdale (NC).The soil of experimental field was red sandy loam with neutral soil pH (6.79), medium in available nitrogen (273.5 kg/ ha), phosphorus (26.11 kg/ha) and potassium (149.38kg/ha). The experiment was laid out in randomized complete block design with three replications. The varieties were planted on 25 June 2012 with row spacing of 60 and 45 cm between plants. Equal quantity of farm yard manure at the rate of 10 t/ha was applied to each plot three weeks prior to sowing. The recommended doses of 20 kg of nitrogen, 75 kg P_2O_5 and 50 kg K_2O/ ha were applied uniformly as basal dose at the time of planting in the form of urea, single super phosphate and muriate of potash, respectively. The remaining 180 kg of nitrogen was applied in seven equal splits immediately after each cut at 40 days interval in the form of urea for establishment of the crop. Five plants were randomly selected in each net plot area for taking observations on growth and yield attributing parameters. The crop in each net plot was harvested separately as per treatment and the values were converted into hectare basis and expressed in quintals. The samples were first dried under shade and then in electric oven at a temperature of 60 degree C until attain constant weight. On the basis of these samples, the green fodder yield was converted into dry matter yield. The data of eight cuts is statistically analyzed for interpretation of results.

Results and Discussion

Green fodder yield: Data indicated that Guinea grass variety JHGG-08-1 recorded significantly higher green fodder yield (1007.04 q/ha/year) as compared to the local check Riversdale (668.63 q/ha/year) and it was on par with the variety RSDGG-2 (851.94 q/ha/year) (Table 1). The higher green fodder yield was due to enhanced plant growth attributes like plant height, increased number of tillers and leaf: stem ratio. These results are in accordance with the findings of Sharma *et al*., (1999).

Dry matter yield: Data revealed that significantly higher dry matter yield (147.72 q/ha/year) was shown in Guinea grass variety JHGG-08-1 when compared with local check Riversdale (100.47 q/ha/year) which was on par with variety RSDGG-2 (133.45 q/ha/year) (Table 1). The higher dry matter yield was due to improved growth parameters like plant height, number of tillers per meter row length and leaf: stem ratio. These results were supported by the findings of Tudsri *et al*., 2002.

Plant height: Data suggested that significantly increased plant height (78.47 cm) was shown in Guinea grass variety JHGG-08-1in comparison to the local check Riversdale (50.24 cm) and was on par with variety Bundel Guinea-1 (NC) (61.96 cm). The higher plant height was mainly attributed to more availability and uptake of nutrients by crop which resulted in more vegetative growth and increase in protoplasmic constituent and acceleration in the process of cell

division, expansion and differentiation and thereby resulting in luxuriant growth. The findings of Onyeonagu and Asiegbu (2005) supported the above results. Leaf : Stem Ratio Pooled data of three years viewed that Guinea grass variety JHGG-08-1 showed significantly higher leaf : stem ratio (0.71) as compared to the local check Riversdale (0.55) and it was on par with variety RSDGG2 (0.70). Increase in the leaf: stem ratio was mainly due to rapid expansion of dark green foliage, which could intercept and utilize the incident solar radiation in the production of photosynthates and eventually resulting in higher meristematic activity and increased leaf: stem ratio. These results are in conformity with the findings of Pathak *et al*., (2006).

Crude protein yield: It is revelled that Guinea grass variety JHGG-08-1 recorded higher dry matter yield (12.99 q/ha/year) as compared to the local check Riversdale (10.38 q/ha/year) which was on par with variety RSDGG-2 (11.34 q/ha/year). The higher crude protein yield was due to increased photosynthetic activity leading to beneficial effects like cell division and elongation which resulted in more production and accumulation of photosynthates tends to increased dry matter production resulting in higher crude protein yield. These results are in accordance with the findings of Pieterse *et al*., 1997 and Sharma *et al*., 1999.

Table 1: Green forage yield and dry matter yield of Guinea grass varieties in north Konkan zone of Maharashtra

E**ntries**	**Green forage yield (q/ha)**	**Dry matter yield (q/ha)**	**Plant height (cm)**	**Leaf-stem ratio**	**Crude protein yield (q/ha)**
JHGG-081,1	1188.94	147.72	78.47	0.71	12.99
RSDGG-2,	851.94	133.45	60.64	0.70	11.34
JHGG-08-2,	722.02	114.47	61.61	0.57	11.18
PGG-710,	396.08	71.90	58.51	0.58	7.04
PGG-702,	454.53	72.42	59.24	0.66	7.21
PGG729,	425.43	67.48	57.58	0.55	6.02
PGG-616 (NC)	668.83	100.47	50.24	0.49	10.38
Riversdale (NC).	498.01	78.00	61.42	0.48	6.78
Bundel Guinea	617.32	99.91	61.96	0.50	9.27
Mean	634.20	98.42	61.07	0.60	9.13
SE±	26.56	6.06			0.84
C. D. (P=0.05)	81.61	18.17			2.08

Conclusion

Based on the present study it can be inferred that Guinea grass variety JHGG-08-1 can be recommended for north zone of Maharashtra which recorded the superior green forage yield (1007.04 q/ha/ year), dry matter yield (147.72 q/ha/year), crude protein yield (12.99 q/ha/year) and growth parameters like plant height (78.47 cm) and leaf: stem ratio (0.71) over local check Riversdale.

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