

RESPONSE OF MULTI-CUT SUMMER FORAGE PEARL MILLET (*Pennisetum glaucum*) TO VARYING LEVELS OF IRRIGATION AND NITROGEN UNDER SEMI-ARID CONDITION OF NORTH GUJARAT

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SUMMARY

A field experiment was conducted during summer seasons of 2011 and 2012 on sandy loam soil at S. D. Agricultural University, Sardarkrushinagar to study the response of multi-cut summer forage pearl millet (*Pennisetum glaucum*) to varying levels of irrigation and nitrogen under semi-arid condition of Gujarat. Twelve treatment combinations comprised four levels of irrigation scheduling (0.6, 0.8, 1.0 and 1.2 IW : CPE) and three levels of nitrogen (100, 150 and 200 kg N/ha). The pooled results showed that irrigation levels at 1.2 IW : CPE ratio showed significant influence on growth attributes viz., plant height, number of tillers and leaf : stem ratio. The irrigation at 1.2 IW : CPE ratio resulted significantly in higher green fodder (1192.34 q/ha) and dry matter yield (288.37 q/ha) over other levels of irrigation. However, maximum water use efficiency (86.07 kg/ha) was recorded with irrigation at 0.8 IW : CPE ratio. The net realization (Rs. 93963/ha) and B : C ratio (3.71) were recorded highest with irrigation at 1.2 IW : CPE ratio. The N levels had significant effects on all the growth parameters like the plant height, number of tillers and leaf : stem ratio. Application of 200 kg N/ha gave significantly higher green forage yield (1145.19 q/ha), dry matter yield (249.74 q/ha), WUE (87.66 kg/ha), net realization (Rs. 83015/ha) and B : C ratio (3.86) over 150 and 100 kg N/ha. Consequently for higher productivity and profitability of multi-cut summer forage pearl millet, it should be grown with irrigation given at 1.2 IW : CPE ratio and fertilized with 200 kg N/ha.

Key words : Dry matter, forage yield, irrigation, nitrogen, pearl millet

Forage pearl millet (*Pennisetum glaucum* (L.) R. BR.) is a good risk cover crop for sustained forage production under irrigated condition. The importance of cultivation of pearl millet is being emphasized due to its profuse tillering habit, multi-cut nature, drought tolerance, resistance to insect-pests and diseases, absence of poisonous prussic acid, good performance even in poor soil, good per day productivity and leafiness. Pearl millet is one of the major summer crops grown for feed and forage in the semi-arid and arid regions with low inputs. It needs relatively less water than other crops and can grow in the regions which are too hot and dry for other crops such as sorghum (Singh and Singh, 1995). However, it readily responds to high fertility and moisture. Also, studies showed that nitrogen (N) application could increase millet production efficiently (Beyaert and Roy, 2005; Maman *et al.*, 2006; Ketterings *et al.*, 2007).

Forage pearl millet is an excellent choice for warm season pasture. Multi-cut nature of the crop ensures the forage supply over a long period of time. Balanced cattle feed and nutritious green fodders are pivotal for enhancing the milk production. Forage pearl millet is an important green fodder crop in the areas of light textured soils that can provide 2-3 cuttings to meet the green fodder requirement of milch animals in **kharif** season. The forage pearl millet locally known as "*Rajka Bajri*" in Gujarat state is widely grown as multi-cutting crop system in Gujarat. It is a heavy feeder of total nutrients due to good tillering capacity, rationing and fast growth rate. Its fresh green fodder yield ranges from 500 to 600 q/ha with 3 to 4 cuttings (Purushotham *et al.*, 2001). In view of the high investment costs of developing irrigation facilities and limited availability of irrigation water, it should be used most efficiently. It