

NITROGEN REQUIREMENT OF TRANSPLANTED AND DIRECT SEEDED PEARL MILLET HYBRID

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Pearl millet (*Pennisetum typhoides* S & H) is the major grain and fodder crop in arid and semi-arid areas of western Rajasthan. The average yield is very low, only 2.53 q/ha which is so mainly due to poor management practices, and lack of timely and adequate rainfall. Under late onset of rains and late sowings, direct seeded pearl millet does not perform well and transplanting from a pre-sown nursery alone gives the optimum yield of pearl millet (Manchanda *et al.*, 1984). The present studies were undertaken to find the economic dose of nitrogen for transplanted and direct seeded pearl millet under saline water irrigation.

A field trial was conducted at the CAZRI Regional Station, Pali-Marwar (Rajasthan) in kharif 1983. The soil was clay loam, having organic carbon 0.62% and pH 7.5. Initially the seedlings of pearl millet hybrid BJ 104 were raised in the nursery under irrigation with saline water EC 3.2 mmhos/cm. On July 18, 25-day old seedlings were transplanted in the field in 5m x 4m plots in rows 45 cm apart and two seedlings per hill, 20 cm apart. Direct seeded pearl millet was also sown the same day in similar plots. There were five levels of nitrogen (0, 40, 80, 120 and 160 kg N/ha), replicated four times in a randomised block design, for both the methods. Half the respective dose of nitrogen and a full dose of 40 kg P₂O₅/ha was applied about 8 cm deep in rows with the help of a tractor drawn drill before seeding or transplanting, and the remaining half of the nitrogen dose was applied in two equal splits, at the tillering and at the boot leaf stage. The total rainfall and number of rainy days during crop growth period were 327.2 mm and 18 days, respectively. Two life saving irrigations of 3.2 mmhos/cm EC water at boot leaf and milky grain stages were applied to direct seeded crop. The transplanted and direct seeded crops were harvested on September 20 and October 10, respectively.

The grain yield in transplanted and direct seeded pearl millet increased significantly, and the maximum grain yields recorded in transplanted and direct seeded pearl millet, were 37.80 and 22.09 q/ha, respectively (Table 1). The higher grain and stover yield in the transplanted pearl millet as compared to the direct seeded one has also been reported by Gautam (1984) and Manchanda and Sharma (1984). The transplanted pearl millet produced 16.94 q higher grain yield i.e., 81.21% higher than the direct seeded pearl millet at and upto 80 kg N/ha.

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Table 1. Yield and yield attributes of transplanted (T) and direct seeded (DS) pearl millet cv. BJ. 104 at different levels of N₂ application

Treatments (kg N/ha)	Yield (q/ha)				Grain yield/plant (g)		Grains produced (kg/kg N)	
	Grain		Stover		T	DS	T	DS
	T	DS	T	DS				
0	23.5	15.4	29.2	22.9	15.0	12.5	-	-
40	25.8	19.2	38.3	30.4	23.0	15.8	5.85	9.58
80	37.8	20.9	40.3	39.8	34.5	18.3	17.91	6.80
120	35.7	21.2	40.3	40.3	30.0	19.3	10.20	4.78
160	27.6	22.1	36.3	45.3	22.0	20.1	2.57	4.16
SEm±	1.49	0.75	2.27	0.94	4.34	4.78		
CD at 5%	3.25	1.63	4.95	2.05	9.45	NS		

Higher yields were obtained in the direct seeded crop upto 160 kg N/ha. Similar results were also obtained by Dahiya *et al.* (1977). Even with no fertilizer N₂ application, an increase of 52.59% in the grain yield of the transplanted pearl millet was recorded.

The maximum stover yield of 40.32 q/ha was also recorded at 80 kg N/ha in the transplanted pearl millet, while it was 45.30 q/ha in the direct seeded pearl millet at 160 kg N/ha. The stover yield in the transplanted pearl millet increased due to higher plant height and higher number of tillers per plant as also reported by Singh (1976). Again, with no nitrogen application, the stover yield was 27.51% higher in transplanted as compared to direct seeded pearl millet. Similar findings were given by Manchanda and Sharma (1984).

Considering the additional kg of grains produced per kg of N₂ applied, the response beyond 80 kg N/ha in the transplanted and 40 kg N/ha in the direct seeded pearl millet decreased with increasing rates of nitrogen (cf. Singh *et al.*, 1978). Evidently, transplanted hybrid pearl millet is more productive, and good yield can be achieved at 80 kg N/ha by transplanting 25 days old seedlings under rainfed condition under saline water irrigation in western Rajasthan.

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REFERENCES

- Dahia, R.D. and Singh, Kanwar 1977. Effect of nitrogen doses and its time and method of application on pearl millet with and without mulch in dry farming conditions. *Ind. J. Agron.* 22 (1) : 35-40.
- Gautam, R.C. 1984. Research findings in bajra cultivation. *Indian Farming* 34 (3) : 7-13.

- Manchanda, H.R. and Sharma, S.K. 1984. Transplanted bajra does well in sodic water irrigated conditions. *Indian Farming* 34 (3) : 15-16.
- Singh, R.P., Daulay, H.S., Singh, K.C. and Gupta, B.S. 1978. Effect of rates and methods of nitrogen application on the yield and yield attributes of rainfed bajra HB-3 grown in the arid zone. *Ann. Arid Zone* 17 (2) : 136-144.
- Singh, R.P. 1976. Fertilizer use in dryland crops : Effect of levels and methods of nitrogen application on the yield and yield attributes of dryland crops, I. Kharif crops. *Ind. J. Agron.* 21 (1) : 27-32.