

Integrated nitrogen-supply system for finger millet (*Eleusine coracana*)

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Finger millet [*Eleusine coracana* (L.) Gaertn.], an important irrigated dryland crop of Tamil Nadu, responds well to nitrogen application. With the increase in cost and inadequate availability of inorganic nitrogenous fertilizers, it has become necessary to formulate an integrated N supply system for efficiency and economy in N management in finger millet.

The field experiment was conducted during the rainy season (*kharif*) of 1989 and 1990 at Killikulam, to study the effect of integrated N supply on finger millet. The treatments included no nitrogen (control), 100% N (60 kg/ha) as inorganic fertilizer alone or with farmyard manure, *Azospirillum*, 50% and 75% N with farmyard manure or *Azospirillum* or both, farmyard manure alone and *Azospirillum* alone. The experiment was laid out in randomized block design replicated thrice. A basal dose of 30 kg P_2O_5 /ha and 30 kg K_2O /ha was applied commonly to all treatments. *Azospirillum* was inoculated through seed (600 g/ha) and soil (2,000 g/ha). The finger millet variety 'K 7' (105 days) was used. The soil of the experiment was sandy loam in texture with neutral reaction, low in nitrogen (171 kg/ha) and higher in phosphorus (24 kg/ha) and potash

(250 kg/ha) content.

Application of 75% of the recommended level of N + farmyard manure 5 tonnes/ha + *Azospirillum* produced taller plants and was on a par with recommended level of N applied as inorganic fertilizer alone. The number of productive tillers and ear length were also higher with 75% of N + farmyard manure + *Azospirillum* compared higher with 100% N as inorganic fertilizer alone. Gautam *et al.* (1982) also reported a similar trend. The grain yield was higher during both seasons (3.63 and 4.44 tonnes/ha) with the application of 75% N + farmyard manure 5 tonnes/ha and *Azospirillum* compared with 100% N as inorganic fertilizer alone (3.26 and 3.87 tonnes/ha). The potential for substitution of 25% inorganic N with organic manure and biofertilizer *Azospirillum* was clearly established by the yield trend in this study. Similar observations were reported by Muthuswamy (1985) and Rao *et al.* (1986). The above-integrated N supply was also cost-effective, as indicated by the highest benefit : cost ratio of 1.59 compared with 1.26 with the alone application of 100% N as inorganic fertilizer. An integrated-N supply system involving the application of 75% of recommended N as inorganic

Table 1. Yield and yield attributes of finger millet as influenced by nitrogen management

Treatment	Plant height (cm)		Productive tillers/hill		Ear length (cm)	Grain yield (tonnes/ha)			Benefit : cost ratio
	1989	1990	1989	1990	1990	1989	1990	Mean	
Recommended level of N (60 kg/ha) as inorganic alone	85.9	96.4	4.5	4.6	7.2	3.26	3.87	3.6	1.26
100% N + <i>Azospirillum</i>	87.3	99.9	5.1	4.9	7.5	3.48	4.35	3.9	1.47
75% N + <i>Azospirillum</i>	83.3	98.3	4.5	4.3	7.4	2.83	3.35	3.1	1.18
50% N + <i>Azospirillum</i>	84.8	89.6	3.8	3.6	6.9	2.78	2.56	2.7	0.96
100% N + FYM 5 tonnes/ha	86.7	100.0	4.4	4.8	7.2	3.41	3.88	3.6	1.13
75% N + FYM 5 tonnes/ha	48.9	95.0	4.0	4.6	6.7	3.08	2.95	3.0	0.95
50% N + FYM 5 tonnes/ha	80.7	94.6	3.7	3.5	6.6	2.04	2.86	2.5	0.62
75% N + FYM 5 tonnes/ha + <i>Azospirillum</i>	88.0	100.3	5.2	4.9	7.6	3.63	4.44	4.0	1.59
50% N + FYM + <i>Azospirillum</i>	81.7	98.3	4.6	4.6	7.2	3.24	3.05	3.1	1.06
FYM 5 tonnes/ha alone	78.7	93.6	3.5	4.1	6.7	2.87	3.21	3.0	1.06
<i>Azospirillum</i> alone	79.1	93.0	3.6	3.9	6.9	2.27	2.62	2.4	0.96
No fertilizer	72.2	85.1	3.1	3.2	5.9	2.18	2.03	2.1	0.71
CD (P = 0.05)	2.75	3.84	0.55	0.55	0.3	0.64	0.52		

FYM, Farmyard manure

fertilizer, farmyard manure @ 5 tonnes/ha and seed-cum-soil inoculation with *Azospirillum* may be recommended for maintaining high grain yield in finger millet.

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Contribution of production parameters to yield of chickpea (*Cicer arietinum*) under dryland condition

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The productivity of chickpea (*Cicer arietinum* L.) is very low (383 kg/ha) in Maharashtra compared with Northern plains. Of the several reasons of low productivity, inadequacy of stored soil moisture, lack of winter precipitation, dearth of improved and high-yielding cultivars, delayed sowing, very low or no use of fertilizers and limited use of plant-protection measures are the important. Ramshe *et al.* (1987) and Jadhav *et al.* (1992) reported that by adopting improved package of practices, chickpea productivity could considerably be increased. Therefore present study was carried to find out the contribution of production parameters to yield of rainfed chickpea.

The experiment was conducted in 2⁴ factorial randomized block design with 3 replications during 1987-88 and 1988-89 at Jeur. The treatments consisted of 4 production parameters; each at 2 levels, viz. cultivars ('Chafa' and 'Vikas'), seeding time (early, September end; and late, October end), fertilizer levels (0 and 12.5 kg N/ha + 25.0 kg P₂O₅/ha) and plant-protection measures (without and with). The seeding was done at the row distance of 30 cm and with an intra-row spacing of 15 cm. The fertilizers were applied at sowing by placement with drilling as per the treatments. The crop was dusted as per the treatments with 10% HCH (BHC) @ 20 kg/ha at initiation of flowering and 15 days later.