Effect of Post Monsoon Irrigation, Biofertilizer and Nitrogen Levels on Growth and Yield of Pigeonpea (*Cajanus cajan* (L.) Millsp.) Var. BDN-2 in Vertisol of South Gujarat

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Field experiment was conducted at College Farm, Gujarat Agricultural University, Navsari during *kharif* seasons of 1989-90 and 1990-91 to study the effect of post monsoon irrigation, biofertilizer and nitrogen levels on yield of pigeopea in vertisol of South Gujarat. Twenty four treatments comprising four levels of irrigation (no irrigation and scheduling irrigation at 0.25, 0.50 and 0.75 IW/CPE ratio) as main plot and combination of two levels of inoculation (with and without *rhizobium* inoculation) and three levels of nitrogen (0, 10 and 20 kg/ha) as sub plot treatments were employed in split plot design with four replications. The pigeonpea Cv. BDN-2 was used for experimental purpose. Irrigation each of 80 mm depth of water was applied as per schedule after the cessation of monsoon in 0.25, 0.50 and 0.75 IW/CPE ratios which received one, two and four irrigations, respectively. The results showed that although all the IW/CPE ratios did not differ significantly among themselves, produced significantly higher grain yield over no irrigation. Most of the growth characters such as plant height, dry matter accumulation, days to maturity, number of leaves, leaf area and LAI as well as yield attributes such as pods per plant, grain weight per plant and 100 grain weight were significantly increased by irrigation. The maturity of crop extended remarkably due to irrigation. Similarly, protein content, protein yield, N uptake by different plant parts and total N uptake from the soil increased considerably by irrigation. The consumptive use of water increased with increase in irrigation levels. However, the WUE decreased with scheduling irrigation at 0.75 IW/CPE ratio. The maximum WUE was recorded with 0.25 IW/CPE ratio, followed by 0.50 IW/CPE ratio.

Rhizobium inoculation failed to exert any significant effect on most of growth and yield attributes. Consequently the yield was not increased upto a significant level. However, the total N uptake increased due to rhizobium incoulation.

Most of the growth and yield attributes were significantly increased with increase in N levels. The highest values for all these parameters were recorded under 20 kg N/ha. The protein content, protein yield, N uptake by different plant parts and total N uptake by plant were also remarkably improved with increase in nitrogen application rate.

The results thus indicate that maximum yield of pigeonpea var. BDN-2 could be obtained by irrigating the crop at IW/CPE ratio of 25 after cessation of monsoon with application 20 kg/ha with or without rhizbium inoculation in vertisol of South Gujarat.

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