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Effect of Different Sources of Nitrogen on *Kachari* (*Cucumis melo*) Performance in the Arid Region

M.K. Jatav*, B.D. Sharma, D.K. Samadia and S.R. Meena
ICAR-Central Institute for Arid Horticulture, Bikaner 334 006, India
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Abstract: The field experiment was conducted at Central Institute of Arid Horticulture (CIAH), research farm with popular *kachari* cultivars AHK119 during 2015 in the kharif season to investigate the effect of different sources of nitrogen on *kachari* performance. Different source of N showed significant effect on growth attributes, as well as yield and nutrients uptake by *kachari*. 80 kg N ha^{-1} through neem coated urea as spilt application proved to be more effective in terms of growth attributes, *kachari* yield, nutrients uptake and recoveries. Neem coated urea application was more superior than calcium nitrate and urea.

Key words: *Cucumis melo*, nitrogen, neem coated.

To achieve nutrition and income security for the people, particularly in hot arid region of north-western parts of Rajasthan, suitable crop-plant species from vegetables are of vital importance. The native crops like *kachari* support livelihood in the hostile situations, where vegetable crop diversification is not much feasible. However, limited attention was paid for its nutrient management and other agronomic aspects. *Kachari* requires hot and dry climate and a long growing season preferably with warmer days for cultivation both as rainy and summer season crop. The high temperature and dryness conditions are beneficial for crop, fruit maturity and quality and are also best for dehydration of *kachari* fruits. *Kachari* variety AHK-119 fruits are small, egg shaped weighing 50-60 g. Fruits are ready for picking in 68-70 days after sowing, 22 fruits per vine, and yields of 95-100 q ha^{-1}.

The crop production in the hot arid regions are constrained by low and erratic rainfall (100-420 mm $year^{-1}$), high evapo-transpiration (1500-2000 mm $year^{-1}$) and poor in soil fertility. Arid region soils are low in organic matter, macronutrient and micronutrient (Shyampura *et al.*, 2002; Rathore, 2009; Yadav and Meena, 2009; Yadav, 2011; Chattopadhyay *et al.*, 1997; Singh, 2006; Singh, 2008; Mahesh Kumar *et al.*, 2011). The low organic matter has been attributed to high temperature, low rainfall, scanty vegetation and single grained structure of soil.

*E-mail: mkjatav2008@gmail.com

Nitrogen is one of the most important and essential nutrient which directly influences the growth, development, yield and quality of crop. Nitrogen is universally deficient in majority of the agricultural soils and successful arable farming is impossible without the use of nitrogenous fertilizers. Moreover, nitrogen fertilization aims at a high economic return of the investment through optimized crop yield and quality. Although, nitrogen is from a quantitative point of view, the most important nutrient in crop production in comparison with phosphorus and potassium, its efficiency is low for crop production. Nitrogen fertilizers upon application to soil are subjected to numerous reactions, transformations and N loss mechanisms such as ammonia volatilization, nitrification and subsequent denitrification, leaching, chemical and microbial immobilization and surface runoff. Thus quite a high proportion of the applied N is lost one way or the other. As a result, N use efficiency for crop production is discouragingly low (Roy and Chandra, 1979; Zia and Waving, 1987). In view of the high cost of nitrogen fertilizer, it is important to improve the N utilization efficiency for crop production with the objective to reduce cost of crop production.

Nutrients requirement of *kachari* differ with soil, climate, cultivar and growth period. Nutrients use efficiency is low in *kachari* in the hot arid region. In view of the high cost of nitrogen fertilizer, it is important to improve the N utilization efficiency for crop production with