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Influence of integrated nutrient management (INM) on growth and yield parameters of elephant foot yam under south Gujarat condition

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ABSTRACT

In order to explore the possibility of improving growth and productivity of elephant foot yam (EFY) by involving integrated nutrient management, an experiment was formulated and conducted during *Kharif* season of 2007-08 and 2008-09 at Rambhas Farm, Krishi Vigyan Kendra of Navsari Agricultural University, Gujarat, India. Nine treatment combinations were evaluated on elephant foot yam variety Gajendra, in randomized block design (RBD) with three replications. Application of 100 % RDF (Through IOS) + *Azospirillum* 5 kg ha^{-1} + PSB 5 kg ha^{-1} (T_7) was proved to be beneficial in connection with corm yield (55.33 t ha^{-1}) which was at par with the treatment of T_4 and T_1 .

Key words : Elephant foot yam (EFY), Organic fertilizers, Inorganic fertilizers, Bio-fertilizers, Growth and yield

Tuber crops are third most important food crops of humankind after cereals and grain legumes. Among the vegetatively propagated tuber crops, elephant foot yam (EFY) Suran / zimikand / ol (*Amorphophallus paeoniifolius* (Dennst.) Nicolson of Araceae family of order Nudiflorae of monocotyledonae, is basically an important tuber crop of the tropical and sub-tropical countries. Because of its higher yield potential, higher biological efficiency, culinary properties, medicinal utility and therapeutic values it is referred as "King of tuber crops". In India, it is grown in almost all the states but commercially cultivated mainly in Andhra Pradesh, Tamil Nadu, Gujarat, Maharashtra, West-Bengal, North-Eastern states, Kerala, Karnataka, Bihar and Uttar Pradesh. High yielding and non-acrid variety *viz*., Gajendra has already been developed but this variety is yet to be popularized for commercial cultivation among the farmers' of South Gujarat. In facts, *Amorphophallus* tubers are cheaper and rich source of important nutrients, vitamins and minerals as well as it also improves the delicacy of the food if incorporated. It has several medicinal properties and found to be effective in the treatment of piles, dysentery, asthma, swelling of lungs, vomiting, abdominal disorders in addition to use as blood purifier. The corm yield ranged 40 to 80 t ha^{-1} and its recommended nutrient requirement is 100-50-150 NPK kg ha^{-1} (Susan John *et al*., 2006).

Several factors have found to affect the growth and yield of elephant foot yam. It has been repeatedly confirmed that continuous sole and imbalanced use of chemical fertilizers leads to deteriorate the soil health and ecological balance in conjuction to decrease the nutrient uptake efficiency of applied plant's nutrients. In this way, it might eventually have manifested either stagnation or plateauing in crop yield and big threats to environmental safety (Virmani, 1994).

The integrated nutrient supply includes the use of chemical fertilizers with organic sources like FYM, crop residues etc. along with bio-fertilizers helps not only in bridging the existing wide gap between the nutrient removal and addition but also in ensuring balanced nutrient proportion, in enhancing nutrient response efficiency, add in maximizing crop productivity of desired quality (Singh and Kalloo, 2000).

Information on the conjoint use of organic sources, chemical fertilizers and their combination with different available and effective bio-fertilizers in this crop under South Gujarat conditions is meager. Looking to the importance, future scope and a heavy demand by all class of consumers as well as to curb the trend of declining yield, there is a great need to find out the most appropriate approach of integrated nutrient management system and thereby increasing the yield of the crop under the question.

Keeping facts in view as high lighted above, the present investigation was taken up with *Amorphophallus*.

MATERIALS AND METHODS

The field experiment was conducted during the *Kharif* season of 2007-08 and 2008-09 at Rambhas Farm, Krishi Vigyan Kendra of Navsari Agricultural University, Gajarat, India. The experiment was laid out in randomized block design with three replications. Total nine treatment combinations namely, T_1 : 100 % recommended dose of