➔DOI : 10.15740/HAS/AJBS/9.2/296-298
e ISSN-0976-8343 | ■ Visit us : *www.researchjournal.co.in*

Asian Journal of Bio Science, Volume **9** | Issue 2 | October, 2014 | 296-298
Received : 08.08.2014; **Accepted :** 30.09.2014

RESEARCH NOTE

Effect of post shooting application of urea and sulphate of potash at the denavelled, distal stalk end of banana cv. Borjahaji

I. SARMA, R. BORGOHAIN **AND** M. PHUKON

Krishi Vigyan Kendra, JORHAT (ASSAM) INDIA
Email : irasarma@gmail.com

A field experiment was conducted at farmer's field under on farm trial during 2011-12, in Jorhat district of Assam, to study the impact of post shooting application of urea and sulphate of potash on the improvement of bunch weight of banana cultivar Borjahaji. The denavelled distal stalk end of the bunch was fed with urea, sulphate of potash blended with fresh cowdung soon after the fruit set. The results showed that when the bunch was fed with urea (7.5g), sulphate of potash (7.5g) blended with 500 g fresh cowdung (T_4) all the yield attributing characters *viz.*, length of fingers, weight of fingers of first hand, weight of fingers of last hand, girth of fingers, weight of first hand, weight of last hand and bunch weight were maximum as compared to denavelling and application of cowdung only (T_2) and application of urea and cowdung at denavelled distal stalk end (T_3). The minimum of all these characters and bunch weight were obtained in control(T_1) where male bud was retained till harvest. The results revealed that the nutrients moved from the blend into the bunch and significantly enhanced the weight of fruits and bunch. When the bunch was fed with urea 7.5 g, sulphate of potash 7.5 g blended with cowdung 500 g (T_4) the response was 34.77 per cent, 11 per cent and 5.9 per cent increase in weight of bunch over the treatments T_1, T_2 and T_3, respectively.

Key words : Urea, De-navelling, Sulphate of potash, Finger, Cowdung, Bunch

How to cite this paper : Sarma, I., Borgohain, R. and Phukon, M. (2014). Effect of post shooting application of urea and sulphate of potash at the denavelled, distal stalk end of banana cv. Borjahaji. *Asian J. Bio. Sci.*, **9** (2) : 296-298.

Banana is the fourth important food crop next to paddy, wheat and milk products and forms an important crop for subsistence farmers. Bananas are an excellent source of potassium and vitamins A, B_6, C and D. Banana crop is widely grown in India and has great socio-economic and religious significance. At present, banana production in India is 27.0 million tonnes from an area of 0.77 million ha and the productivity is 34.4 tonnes. The major banana growing states in India are Tamil Nadu, Maharashtra, Gujarat, Andhra Pradesh, Karnataka, Madhya Pradesh, Bihar and West Bengal. Tamil Nadu has the largest area of 0.12 million ha and the production is 6.4 million tonnes while Maharashtra has the second largest area of 0.08 million ha with a production of 5.2 million tonnes (Anonymous, 2010). It is also used as dessert fruit for millions of people and can be used as staple food due to its rich and easily digestible carbohydrates. Owing to its multifaceted uses from underground stem up to the male flower it is referred as kalpatharu. In Assam, the area under banana is 51.51 thousand hectare and productivity is 16.25 t/ha. In South East Asian countries manipulation of fruit size to enhance the size of fingers is a common practice (Kotur and Keshava Murthy, 2008). To supplement nutrients applied to banana plant through soil and foliage, de-navelling (removal of male inflorescence) and post shooting feeding through the distal stalk-end of the rachis have gained importance (Kumari, 1986; Ancy *et al*., 1998 and Ancy and Kurien, 2000). De-navelling serves dual purpose of saving mobilization of food into the unwanted sink of banana plant and also earns additional income when the excised male bud is used as a vegetable (Singh, 2001). Banana owing to its large size and rapid growth rate require relatively large amount of nutrients for high yields of quality fruits and it is estimated that 50 tonnes of banana in one hectare removes 320kg N, 32kg P_2O_5 and 925kg K_2O every year (Lahav and Turner, 1983). Application of inorganic fertilizers though increases the yield substantially but could not able to sustain the fertility status of the soil (Bharadwaj and Omanwar, 1994) and have caused several undesirable consequences in the fragile soil

eco-system, leading to gradual decline in productivity. Bhalerao *et al*. (2009) observed that combined application of 100 per cent recommended dose of NPK along with organic manures increased the growth and also yield attributes. Similar trend was also reported by Hazarika and Ansari (2010a); Badgujar *et al*. (2010) and Barakat *et al.* (2011) in banana. For obtaining high yield with superior quality bananas, adequate supply of plant nutrients with irrigation and improved cultural practices are of prime importance. Studies conducted so far in India have revealed that considerable yield increment in banana could be achieved by adequate supply of nutrients. Among the major plant nutrients nitrogen and potash are required in large quantities for the growth, development and yield. Nitrogen acts as a chief promoter to build up a strong vegetative frame at the early phase which decides the productivity of banana plant. Post shooting application of urea has been reported to promote yield in banana because urea is readily absorbed by the banana plant.

A field experiment was conducted at farmer's field under on farm trial during 2011-12, in Jorhat district by using the banana cultivar 'Borjahaji'. The experiment was laid out in a Completely Randomized Block Design consisted of four treatments and five replications. The treatments taken were :

T_1: Control (retention of male bud till harvest)

T_2: Removal of male bud and application of cowdung (500 g) +100 ml water

T_3: Removal of male bud and application of urea (7.5 g) + cowdung (500 g) + 100 ml water

T_4: Removal of male bud and application of urea (7.5 g) + sulphate of potash (7.5 g) + cowdung (500 g) + 100 ml water.

The rachis of the distal end of the bunch was excised along with the male bud giving a slanted cut immediately after all the pistillate flowers had formed into fruits. Half kilogram cowdung was mixed with 100 ml water to form slurry with the required quantities of urea and sulphate of potash. The blend was placed in a polythene bag and tied carefully to dip the excised rachis into the slurry. Uniform bunches carrying equal hands were selected to receive the treatments. Data on finger length (cm), weight of fingers of first hand (g), weight of fingers of last hand (g), weight of first hand (kg), weight of last hand (kg), finger girth (cm), bunch weight (kg) were taken at the time of harvest of the bunch.

The results of the present study indicated that among the four different treatments, the treatment combinations urea (7.5 g) + sulphate of potash (7.5 g) + cowdung (500 g) + 100 ml water (T_4) recorded significant improvement in yield parameters *viz.*, length of fingers (14 cm), weight of fingers of first hand (203.06 g), weight of fingers of last hand (155.29 g), girth of fingers (13.19 cm), weight of first hand (3.04 kg), weight of last hand (2.33 kg) and maximum bunch weight (20.66 kg) as compared to application of cowdung alone (T_2) and urea blended with cowdung (T_3) (Table 1). The minimum of all these characters and bunch weight (18.33 kg) were obtained in control (T_1) where male bud was retained till harvest. In this experiment urea was used as a substitute of ammonium sulphate (Kotur and Keshava Murthy, 2008). It was reported that when ammonium sulphate or urea and sulphate of potash were blended in cowdung, an enhanced increase in nitrogen content was observed in all parts of bunch but nitrogen content of fruits showed a significant decrease as compared to feeding with ammonium sulphate alone, this may be due to the dilution caused by the substantial increase in dry (weight) matter of fruits. The addition of sulphate of potash in the blend increased Ndff (nitrogen derived from fertilizer) significantly over the blending of ammonium sulphate alone. Direct relationship existed between nitrogen content and bunch weight (Kotur and Keshava Murthy, 2008). Removal of male bud caused an increase in weight because conservation and utilization of energy for finger development which would be otherwise lost for opening of the remainder of the flower and removal of a strong and active competing sink for photosynthesis, despite its smaller size relative to the bunch (Kurien *et al*., 2000; Ancy and Kurien, 2000; Singh, 2001 and Kotur; Keshava Murthy, 2008). Burhagohain and Shanmugavelu (1986) also reported the exogenous feeding and translocation of nutrients into the bunch in banana variety 'Poovan (AB)', 'Monthan (AAB)' and 'Nendran (AAB)'. It was reported that the urea enhance the urease activity in the fruits (Ancy, *et al.*, 1998, Kotur and Keshava Murthy, 2008). Addition of sulphate of potash to the blend increased potash content thereby increase the yield parameters (Kotur and Keshava Murthy, 2008). However, tying urea at the rachis promoted the yield of bunch and hand because of the availability of urea in aqueous form at later stages for a

Table 1 : Effect of urea, sulphate of potash and cowdung in improvement of yield parameters and bunch weight of banana cv. Borjahaji

Treatments	Length of fingers (cm)	Girth of fingers (cm)	Weight of fingers of first hand (g)	Weight of fingers of last hand (g)	Weight of first hand (kg)	Weight of last hand (kg)	Weight of bunch (kg)
T_1	12.33	12.16	170.38	130.67	2.50	1.92	18.33
T_2	12.61	12.29	196.44	139.44	2.86	2.09	18.61
T_3	13.01	12.86	200.41	152.53	2.98	2.41	19.50
T_4	14.00	13.19	203.06	155.29	3.04	2.33	20.66
C.D. (P=0.05%)	0.33	0.23	0.28	0.28	0.15	0.18	0.10

prolonged period. Denavelling of the bunch and feeding with cowdung (T_2) only resulted 13.96 per cent increase in bunch weight over the control (T_1). The increase in bunch weight was 27.2 per cent over T_1 and 4.78 per cent over the treatment T_2 when cowdung was blended with urea (T_3). When the bunch was fed with urea 7.5g, sulphate of potash 7.5g blended with cowdung 500g (T_4) the response was 34.77 per cent, 11 per cent and 5.9 per cent increase in weight of bunch over the treatments T_1, T_2 and T_3, respectively.

The study revealed that the treatment combination urea (7.5 g) + sulphate of potash (7.5 g) + cowdung (500 g) + 100 ml water (T_4) produced maximum of all the yield attributing characters *viz.*, length of fingers ,weight of fingers of first hand, weight of fingers of last hand, girth of fingers, weight of first hand, weight of last hand and bunch weight as compared to other two treatments and the control.

LITERATURE CITED

Ancy, T.K., Kurien, S., Augustin, A. and Balachandran, P.V. (1998). Urease activity in banana fruit. *J. Plant Nutr.,* **21** (2) : 127-40.

Anonymous (2010). National Horticulture Board. Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India, NEW DELHI, INDIA.

Ancy, T.K. and Kurien, S. (2000). Bunch stalks feeding of urea in banana *Musa* (AAB group) 'Nendran'. *Sci. Hort.,* **84** : 205-12.

Badgujar, C.D., Pujari, C.V. and Patil, N.M. (2010). Evaluation of banana cultivars under different fertilizer regimes. *Asian. J. Hort.*, **4**(2): 332-335.

Barakat, M.R., Kosary, S.E. and Nafea, M.H.A. (2011). Enhancing Williams banana cropping by using some organic fertilization treatments. *J. Hort. Sci. Ornamental Plants*, **3**(1): 29-37.

Bhalerao, N.M., Patil, N.M., Badgujar, C.D. and Patil, D.R. (2009). Studies on integrated nutrient management for tissue cultured Grand Naine banana. *Indian J. Agric. Res.,* **43**(2): 107-112.

Bharadwaj, V. and Omanwar, P.K. (1994). Long term effects of continuous rotational cropping and fertilization on crop yields and soil properties- II. Effects on EC, pH, organic matter and available nutrients of soil. *J. Indian Soc. Soil Sci.*, **42**(3): 387-392.

Buragohain, R. and Shanmugavelu, K.G. (1986). Studies on the effect of post shooting application of urea in Vayal Vazhai' banana (ABB). *Banana Newslr.*, **9** : 16-8.

Hazarika, B.N. and Ansari, S. (2010a). Effect of integrated nutrient management on growth and yield of banana to organic manuring. *Trop. Agric.,* **133**: 117-229.

Hazarika, B.N. and Ansari, S. (2010b). Effect of integrated nutrient management on growth and yield of banana cv. Jahaji. *Indian J. Hort.,* **67**(2): 270-273.

Kotur, S.C. and Keshava Murthy, S.V. (2008). Enhancing the fruit yield of Robusta banana (*Musa* x *Paradisiaca*) by de-navelling and feeding nitrogen, potassium and sulphur through the distal stalk-end of the bunch. *Indian J. Agril. Sci.,* **78** (2) : 109-15.

Kumari, Prassanna, Amma, S., Babylatha, A.K., Pushkaran, K. and Kurien, T. K. (1986). Studies on the effect of removing terminal hands and male bud on the yield and fruit size of banana *Musa* (ABB group) 'Palayankodan'. *South Indian Hort.,* **34** : 204-9.

Kurien, S., Anil, B.K., Rajeevan, R. K, Bharathan and Krishnan, S. (2000). Phosphorous mobilization to uneconomic tissues and effects of bunch trimming regimes in banana. *Scientia Hort.,* **82** : 25-35.

Lahav, E. and Turner, D.W. (1983). Banana nutrition. *Internat. Potash Inst. Bull.,* **7**: 33.

Singh, H.P. (2001). Banana (*In*) *Handbook of Horticulture,* p152. Chadha K.L. (Ed). Indian Council of Agricultural Research, New Delhi (INDIA).