



Influence of Micronutrients on Growth and Yield of Banana

V Krishnamoorthy¹ and Noorjahan A KA Hanif²

Krishi Vigyan Kendra,
Tamil Nadu Agricultural University, Viringipuram, Vellore 632 001 (Tamil Nadu)

ABSTRACT

The study was conducted by Krishi Vigyan Kendra, Tamil Nadu Agricultural University during 2011-12 to study the effect on application of different micronutrient formulations on growth, yield and quality of banana cultivar poovan. The four different formulation T1: No application of micronutrients, T2: Foliar Application of FeSo_4 0.20%, ZnSo_4 0.5%, CuSo_4 0.2% and borax 0.1% at 3, 5, 7 months after planting, T3: Soil Application of NRCB banana Sakthi at the rate 10g per plant on 3MAP. T4: Application Arka banana special @ 250 ml of 0.5% solution to the soil followed by foliar application of 0.5%, on 5,6,7,8 months after planting in five farmers field at Kammandadu village of Pudukkottai district during June, 2011. The results revealed that the highest pseudostem height of 2.48m, pseudostem girth of 76 cm, number of leaves per plant (18 nos.), leaf area index(4.72), finger weight (123g) bunch weight (20.10kg) and TSS (16.6° Brix) were recorded with application of Arka banana special micronutrients followed by foliar application micronutrients and soil application. The Arka banana special application through soil application 250 ml solution (%) on 45days after planting, followed by foliar application 0.5% on 5,6,7 and at shooting on hands recorded significantly highest yield (45.23 t/ha) over other two micronutrient application.

Key Words: Soil application, Foliar application, Zinc, Iron, Copper, Boron.

INTRODUCTION

Banana is one of the major fruit crops in India, occupies 8.03 lakh hectares with the production of 29.7mt and 37t of productivity per hectare. The area under cultivation in Tamil Nadu is 1.18 lakh hectares, with the production of 56 lakh tones and 47.9 t of productivity per hectare. In Pudukkottai district is cultivated 3,426 ha with the production of 2.19 lakh t and productivity 38 t/ha. The major soil type of this district is red lateritic having low in nitrogen, medium in phosphorus and high in potassium content. The most of the cultivable land soil is deficient in micronutrients viz., zinc, iron, magnesium and boron. An average the banana crops removes 6 kg of iron, 125 kg of magnesium, 4.70 kg of zinc, 12.0 kg of manganese 0.37kg copper and 1.27 kg of boron from one hectare. To meet the required micronutrients demand, external application is necessary to get maximum yield. There are different recommendation available for banana but not followed

by the farmers. Hence the present investigation was taken up to study the effect of three recommended micronutrient application as technology capsule for obtaining higher yield in banana.

MATERIALS AND METHODS

The trial was conducted during 2011-12 at five farmers' field in Kammandadu village of Pudukkottai district. There were four treatments viz. T1: No application of micronutrients, T2: Foliar application of ZnSo_4 0.5%, FeSo_4 0.20%, CuSo_4 0.20%, Borox 0.10% at 3,5,7 months after planting (MAP) recommended by TNAU, Coimbatore. T3: Soil application of NRCB banana sakthi @ 10g/plant on 3 months after planting. T4: Soil and Foliar application of Arka banana special (IIHR, Bengaluru) @250 ml 0.50 % solution per plant on 45 days after planting followed by foliar application of 0.5% on 5,6,7 MAP and on bunches and leaves after one month of shooting.

Corresponding Author's Email: krishorttnau@gmail.com

²Department of Horticulture, Agriculture College and Research Institute,

The planting was taken up during June 2011 in randomized block design with five replication. The pits of one and half foot cubic size were dugout at 2.1 x 2.1m and filled with organic manure 10kg, 250g neem cake, 50g lindane, *Pseudomonas fluorescens* 25g/plant. Biofertilizers *Azospirillum* and *Phosphobacteria* each 20g/plant. The growth parameters viz pseudostem girth, pseudostem height, number of leaves per plant, leaf area index, days to shooting, yield and quality parameters viz., number of hands/bunch, number of fingers/hand, bunch weight, finger weight and total soluble solids content in ripened fruits were recorded. The data obtained were statistically analyzed for analysis of variance. The soil type was red lateritic with pH of 6.7 and EC was 0.9. The available nitrogen, phosphorus, potassium content is 127, 13, 210 kg/ha, respectively. The soil contains zinc 1.42ppm, iron 5.74ppm, manganese 3.24ppm, copper 0.26ppm of micronutrients.

RESULTS AND DISCUSSION

The results of the experiment revealed that the highest pseudostem height of 2.48m was recorded with the application of Arka banana special through soil and foliar followed by foliar application of

micronutrients (T3) followed by application NRCB banana sakthi through soil.

The pseudostem girth was also proportionately increased to give strength to the plant to withstand the bunch weight. The highest pseudostem girth of 76cm was found with the application of micronutrients through soil and foliar application of Arka banana special micro nutrients. Kumar and Jeyakumar (2001) reported increased pseudostem girth and height with application of micronutrients. The more number of leaves per plant (18 nos.) was registered with the application of Arka banana special through soil and foliar followed by foliar application (17 nos.) alone and soil application (16 Nos.) alone. The maximum leaf area index of 4.72 was recorded in application of micronutrients (T4) through soil and foliar followed by 4.69 in foliar application of micronutrients. Yadlod and Kadam (2008) also observed that the number of leaves and leaf area index increased due to micronutrients application in banana.

The application of micronutrients through soil and foliage resulted in maximum pseudostem girth, pseudostem height, numbers leaves with maximum leaf area were also reflected in floral bud differentiation which resulted in early shooting

Table 1. Effect of micronutrients on growth and yield parameters of banana.

Sr. No.	Character	T1	T2	T3	T4	S.Ed.	C.D. (0.05)
1.	Pseudostem girth (cm)	52	62	71	76	2.40	4.82
2.	Pseudostem height (m)	1.82	2.06	2.38	2.48	0.02	0.04
3.	No. of leaves /plants	16	16	17	18	-	NS
4.	Leaf area index	4.64	4.66	4.69	4.72	0.10	0.20
5.	Days to shooting	243	238	235	230	1.50	3.22
6.	No. of hands/bunch	11	11	11	11	-	NS
7.	No. of fingers /hand	14	14	14	14	-	NS
8.	No.of fingers/bunch	160	161	162	164	1.50	3.20
9.	Finger weight (g)	101	106	113	123	2.6	5.4
10.	Bunch weight (kg)	16.12	17.22	18.24	20.10	0.60	1.22
11.	TSS (obrix)	16.1	16.3	16.4	16.6	-	NS
12.	Yield (t/ha)	36.27	38.75	41.04	45.23	2.24	4.18

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(230 days) followed by delayed shooting (235 days) of the plants in foliar application of micronutrients (Table 1)

The number of hands per bunch, number of fingers per hand and bunch were not recorded significant values with the application of micronutrients through soil and foliar, foliar alone and soil alone. The maximum finger weight (123 g), bunch weight (20.10 kg) and yield (45.23 t/ha) were recorded with (T4) soil and foliar application of Arka banana special @ 250ml of 0.5 per cent solution to soil on 45 days after planting, foliar application on 5,6,7,8 months after planting followed by foliar application (T3) of ZnSO₄ 0.5%, FeSO₄ 0.2%, CuSO₄ 0.2%, borax 0.1% on 3,5,7 months after planting.

The quality of banana fruit was assessed by total soluble solid content. The maximum value of 16.6° brix was recorded with the soil and foliar application of micronutrients followed by foliar application alone. Pathak *et al* (2011) also reported the earliness in shooting, higher finger weight and bunch weight due to the application of micronutrients in banana.

CONCLUSION

The results revealed that the highest pseudostem height of 2.48m, pseudostem girth of 76 cm, number

of leaves per plant (18 nos.), leaf area index(4.72), finger weight (123g) bunch weight (20.10kg) and TSS (16.6° Brix) and highest yield (45.23 t/ha) were recorded with application of Arka banana. The Arka banana special application through soil application 250 ml solution (%) on 45days after planting, followed by foliar application 0.5% on 5,6,7 and at shooting on hands over other two micronutrient application.

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