ABSTRACT

OF THE THESIS
EVALUATION OF THE EFFICACY OF SOME PRACTICES CONVENTIONALLY USED FOR
THE PRODUCTION OF LOCAL CULTIVARS OF CHINA BANANA – AAB (Musa paradisiaca)
IN ANDAMANS: AN ENVIRONMENTAL PHYSIOLOGICAL STUDY

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Abstract

In Andaman district, the total banana cultivated area in the year 2012-13 was 378.5 ha and it was decreased to 278.5 ha in the year 2014-15. It has been seen that the total quantity of production of banana was decreased from 6727.5 metric tonnes to 3202.0 metric tonnes due to decrease in cultivated area and poor management practices. Considering the year round availability, nutritional value, uses, prices, popularity and production, cv. China banana- AAB (Musa paradisiaca) is considered to be the most valuable fruit crop in Andamans. Field experiment were carried out at Indian Council of Agricultural Research – Krishi Vigyan Kendra, Central Island Agricultural Research Institute, Sippighat, Andaman and Nicobar Islands and the data from this study revealed that the planting systems significantly influenced the bunch yield of banana. It has been observed that the China banana planted under high density planting (2 x 3 m plant to plant and row to row) significantly registered higher bunch yield of 38.31 t ha⁻¹ than that of normal planting (2 x 2 m plant to plant and row to row ) which gave a production of 28.21 t ha⁻¹ of bunch yield. Fertigation levels exerted significant effect on the bunch yield. Fertigation at 125 percent recommended NK g pit⁻¹(F₂) recorded the highest bunch yield of 42.05 t ha⁻¹ followed by fertigation at 100 percent recommended NK g pit⁻¹(F₁) with 39.39 t ha⁻¹. The lowest bunch yield was recorded from 50 percent recommended NK g pit⁻¹(F₂) with 23.73 t ha⁻¹. It was observed that 3 percent Panchagavya (G₃) performed better with the yield of 34.91 t ha⁻¹, followed by Gibberellic acid (34.61 t ha⁻¹) at 50 ppm. There is significant interaction effect among the planting systems, fertigation levels and growth regulators on bunch yield. The highest bunch yield was obtained from the combination of high density planting with fertigation level at 125 percent recommended NK and application of Panchagavya at 3 percent (54.80 t ha⁻¹). The lowest bunch yield was recorded from combination of normal planting with fertigation level at 50 percent recommended NK and application of GA₃ at 50 ppm (21.06 t ha⁻¹).

Key words; - Andaman, China banana, Panchagavya, Fertigation, Application
Introduction

The Andaman and Nicobar groups of Islands, which are part of India and often described as Islands of the 'Marigold Sun', lie in the South-Eastern part of Bay of Bengal, within 6° to 14° North Latitude and 92° to 94° East Longitude and they form the remotest part of India. They comprise around 572 islands and islets on Bay of Bengal Sea. The northern most point is Landfall Island, about 190 kms, from Myanmar. The southernmost Island is Great Nicobar, which is only about 150 kms, from Indonesia. The agriculture in the Andaman Islands is less than 100 years old though the Plantation Crops (coconut and arecanut) in the Nicobar Islands are a few centuries old. The total geographical area of Andaman and Nicobar Islands is 8,249 sq km, out of which, about 86 percent is under forest cover and only 50,000 hectares area is available for agriculture. A severe earthquake with Tsunami (26th December, 2016 with a Richter scale of 9.3), caused extensive damage to human life, livestock, agriculture, infrastructures etc. and out of 50,000 hectares area under agriculture and plantation, 8,068.71 hectares were damaged by the earth quake/tsunami. Among them 2,177.70 hectares were under paddy and other field crops and 5,891.01 hectares were under plantation crops. 4,206.64 hectares of the damaged area are still under permanent submergence, while remaining 3,862.07 hectares formed reclaimable area. In these Islands the fruit crops are being cultivated in an area of about 3,160 hectares, scattered in different islands with an annual production of about 28,772 metric tonnes (Dept. of Agriculture, April, 2011).
Objectives

The present thesis entitled “Evaluation of the efficacy of some practices conventionally used for the production of local cultivars of China banana - AAB (Musa paradisiaca) in Andamans: An environmental physiological study”, was the result of investigation undertaken with the following objectives –

1. To find out the effect of planting systems on growth, yield and quality of China banana.

2. To optimize the fertilizer schedule through fertigation under different planting systems.

3. To study the influence of growth regulators on yield and quality of banana planted under different systems.

4. To work out the economics of different treatments.
Results and Discussion

The China banana under high density planting (2 x 3 m plant to plant and row to row) significantly registered higher bunch yield of 38.31 t ha⁻¹ compared to normal planting (2 x 2 m plant to plant and row to row) which gave a production of 28.21 t ha⁻¹. Fertigation at 125 percent recommended NK g pit⁻¹(F₄) recorded the highest bunch yield of 42.05 t ha⁻¹ and the lowest yield was from 50 percent recommended NK g pit⁻¹(F₂) with 23.73 t ha⁻¹. 3 percent Panchagavya (G₃) gave better yield of 34.91 t ha⁻¹, followed by Gibberellic acid (34.61 t ha⁻¹) at 50 ppm. There is significant interaction effect among the planting systems, fertigation levels and growth regulators on bunch yield. The highest bunch yield was obtained from the combination of high density planting with fertigation level at 125 percent recommended NK and application of Panchagavya at 3 percent (54.80 t ha⁻¹). The lowest bunch yield was recorded from combination of normal planting with fertigation level at 50 percent recommended NK and application of GA₃ at 50 ppm(21.06 t ha⁻¹).
Summary and Conclusion

- The present study was undertaken to evaluate the efficacy of some practices used for the production of local cultivars of China banana – ABB (Musa paradisica) in Andaman: An environmental physiological study. The objective were to find out the effect of planting systems on growth, yield and quality of China banana- ABB (Musa paradisiaca), optimize the fertilizer schedule through fertigation under different planting systems, study the influence of growth regulators on yield and quality of China banana planted under different systems and also work out the economics of different treatments.

Andaman and Nicobar Island is a chain of 572 Island stretched from North to south. Only 38 islands are inhabited and 8 islands are covered under various settlement program. In term of livelihood, about 50% of the union territory population is directly dependent of agriculture and allied activities. Only about 6 percent of the non-forested land i.e. about 50,000 ha is being used for agriculture purposes of which 10, 561 ha is under field crops and 29774 ha is under plantation crops. Devastating Tsunami of December, 2004 damaged permanently about 9 percent (4206 ha) of Agriculture Land. Half of the agriculture land is used for coconut plantation, 10 percent is for areca nut and 20 percent for Fruits (banana 12 percent), Vegetables and Root Crops and 20 percent is for Paddy Cultivation.

- High density planting along with fertigation enables phenomenal yield increase in China banana. This method increases the productivity by 50 percent and reduces the cost of production by saving 25 percent chemical fertilizers and 30 – 40 percent water. It has been clearly established that leaching and run off of nutrients is checked since small quantities of fertilizers are applied at frequent intervals.

- China banana planted under high density planting significantly registered higher bunch yield of 38.31 t ha\(^{-1}\) than that of normal planting (P\(_{1}\)) which recorded 28.21 t ha\(^{-1}\) of bunch yield.
Among the fertigation levels, fertigation at 100 percent NK g pit$^{-1}$ was found the highest number of hands bunch$^{-1}$ (7.41) and higher number of fingers hand$^{-1}$. Fertigation at 125 percent recommended NK g pit$^{-1}$ significantly recorded shorter crop duration of 367 days.

Growth regulators exerted significant influence on the number of fingers hand. Application of *Panchagavya* 3 percent gave highest number of (7.46) fingers hand$^{-1}$.

Significant interaction was found among the planting system, fertigation levels and growth regulators. The highest number of fingers hand$^{-1}$ was obtained from normal planting, fertigation level at 125 percent of recommended NK g and application of *Panchagavya* at 3 percent. Among the growth regulators, application of *Panchagavya* at 3 percent recorded higher number of 68.60 fingers bunch$^{-1}$, the highest fruit length of (11.08 cm), higher fruit girth (11.62 cm), greater bunch weight (10.28 Kg plant$^{-1}$) and significant increase in bunch yield (34.61 t ha$^{-1}$) compared to the application of GA$_3$ at 50 ppm.

The extension agencies concentrates mostly on coconuts and their attention in banana or other fruit crop is very limited. Lack of institutional credit, low level of fertilizer consumption, absence of banana based cropping system, absence of proper marketing machinery to ensure a fair and legitimate return to the producer.

China banana is a year round crop, requires plenty of water and rainwater is well distributed throughout the year.

The productivity of China banana is low at present in Andaman and Nicobar islands, mainly due to inadequate awareness of hi-tech intervention and unscientific methods of cultivation.