

## Original Research Article

# Effect of Arka Banana Special Micronutrient Mixture and Bunch Cover on Yield and Quality enhancement in Banana

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## ABSTRACT

One of the main fruit crop of Koppal district Banana is occupies 1028 ha area. ICAR-Krishi Vigyan Kendra, Koppal has conducted front line demonstration to improve the banana bunch quality and yield in 2018-19 and 2019-20 in G-9 and Yalakki banana cultivars after preliminary survey conducted in DFI and major banana growing villages of the district. The treatment like application of banana special and bunch cover were carried out in specific crop periods. It was recorded that there was 24.49 q/ha and 19.0 q/ha increased yield in G-9 and Yalakki respectively was observed. This increased yield could be due to increased individual hand and bunch weight. The demonstrated farmers experienced 24502 Rs and 42925 Rs increase in net income in G-9 during 2018-19 and 2019-20 respectively and 39805 Rs increased net income in Yalakki banana during 2019-20. Farmers who adopted theses technology was acknowledge that they got increase price in the market because of blemish less, good quality and high weight banana bunches.

### Keywords

Banana special,  
Bunch cover, DFI,  
Net income, FLD

## Introduction

Banana is an important fruit crop and has a great socio-economic significance in Karnataka. Musa species where banana belong is one of favourite plantation crops in the world, having very high heritage and culture. It delights as symbol of prosperity, wealth and fertility. Banana is a very popular fruit due to its low price and is used both as vegetable and as a dessert fruit. Globally, India stands first in both area and production of banana and contributes more than 20 percent of global production but has very less

(< 0.05 %) contribution to the international banana market. In India, banana is the 2nd most important cultivable fruit crop, then to mango (Chhuria *et al.*, 2016). Banana provides nutrition and well-balanced diet to millions of people around the globe and also contributes to livelihood through crop production, processing and marketing (Singh, 21). Banana comprises area of 1028 ha among all fruits grown in this district with the production of 30456 MT and productivity of 29.62 MT/ha with different types like G-9, Yalakki and Sugandhi Banana.

The quality characteristics of ripened fruits are mainly determined by the genetic potential of the cultivar and nutrient status of the soil (Roy and Chakroborty, 1993). Banana is a high nutrient requiring crop. It requires a continuous supply of nutrients at proper growth stages for enhanced yield and productivity. The crop requires large amount nutrients and it consumes both the major and micronutrients for its growth, development and yield (Thangaselvabai *et al.*, 2009; Hazarika and Ansari, 2010). The unscientific crop management practices being adopted by farmers led to poor utilization of nutrients and thereby resulted in low productivity. In this context an efficient and judicious use of fertilizers along with micronutrient application is essential for attaining higher yield per unit area. Protection of young bunches of fruits with polyethylene bag covering is one of the measures use in the producer countries (Amani, 2005). The use of polyethylene bunch covers is widespread throughout the commercial banana growing regions of the world. The practice is regarded as essential to improve the market quality and yield of the fruit. Bunch covers provide protection to the fruit surface against pathogens, wind damage, leaf and petiole scarring, dust, light hail, sunburn, bird feeding, and handling damage during harvest and transport.

Keeping this in view, the present study was initiated to find out the response of micronutrient mixture application along with bunch cover in banana. The study was also aimed to provide the farmers in scientific nutrient management of banana and also to evolve a cost-effective nutrient management system and protection to banana bunches to get the higher yielding good quality produce of banana. Hence Krishi Vigyan Kendra, Koppal, Karnataka during 2018-19 and 2019-20, conducted a front-line demonstration to create awareness on effect of foliar

application of Arka Banana special micronutrient mixtures and bunch cover in banana for yield and quality enhancement.

## **Materials and Methods**

### **Initial survey**

The FLD was carried out in the DFI and Major banana growing villages of Koppal district viz., Muddalagundi, Vataparvi, Chikkabommanala, Chikkadankanakal during 2018-19 and 2019-20. Initially base line survey was conducted in all 4 DFI villages and finalised the critical component according to the information collected under the survey. During 2018-19 and 2019-20 each 3 farmers were selected under Vataparvi, Kataraki, Mallapura villages of koppal district which were comes under DFI villages and major banana growing areas.

### **Experimental detail**

The selected farmers were distributed with Arka Banana special micronutrient mixture which is developed by Indian Institute of Horticulture research, Hesaraghatta, Bengaluru and banana bunch cover during 5<sup>th</sup> month crop stage. Farmers were informed to take 5-6 spray of micronutrient from the 5<sup>th</sup> month at 30 days interval further farmers made explained about how to take the spray of micronutrient nutrient, dosage (mixing 75 grams of banana special in 15 litres of water with one shampoo pack *et al.*, and one lemon as scheduled in treatment). Farmers knowledge was also enhanced by making them understand the advantage of spray of micronutrient to leaves and bunches rather soil application. The bunch covers were put to the banana bunches after removal of male flower bud. The other cultural practices like balanced application of major nutrients and secondary nutrient and other good management practices. The Front Line

Demonstration was conducted in two banana types G-9 (2018-19) and Yalakki (2018-19 and 2019-20) in irrigated situation.

During the trial, yield parameters viz., individual bunch weight, Individual hand weight, Number of Hands per bunch, total bunch yield was recorded and economic parameters viz, gross cultivation expenses, gross income, net income and B:C ratio were calculated.

## **Results and Discussion**

### **Average yield of Banana cv. G-9 and Yalakki**

Banana special and bunch cover application through front line demonstration conducted during 2018-19 and 2019-20 in G-9 and Yalkki Banana resulted in 7.83 and 6.87 percent increase in G-9 banana in both the years respectively and 13.76 percent increase in Yalakki banana in 2019-20. In continuation it was also observe the increased difference in the average yield of 22.4 q/ha in G-9 banana and 19.0q/ha in yalakki banana (Table 2).

### **Average hand and bunch weight of Banana cv. G-9 and Yalakki**

Additional parameter recorded showed that 23.72 and 22.00 percent increase in average weight of one hand of banana in a bunch which is randomly selected during 2018-19 and 2019-20 and 37.68 percent increase of hand weight in yalakki banana during 2019-20. On an average 0.42 kg and 0.68 kg increased hand weight was observed in G-9 variety during 2018-19 and 2019-20 and 0.21kg increased hand weight in yalakki banana in 2019-20 was recorded. Another parameter like average bunch weight was also observed, it was found that there was a percent increase of 6.9 and 5.1 in average bunch weight of G-9 in both the years and

18.94 percent increase in yalakki banana in 2019-20. The increased bunch weight indirectly responsible for the average increased hand weight (Table 1).

### **Economics of Banana cv. G-9 and Yalakki**

Both the technology on different banana resulted in increase in percent income of 11.64 and 18.71 in G-9 banana in both the years and 32.20 percent increased income in yalakki banana in 2019-20 was observed. An average increase of 24502 Rs and 44925 Rs net income per ha was recorded in G-9 variety during 2018-19 and 2019-20 and net income of 39805 Rs was recorded in Yalakki banana during 2019-20.

The farmer method had observed with significantly lowest average hand weight, bunch weight and yield per hectare both in the years of front-line demonstration during 2018-19 and 2019-20. Application of micronutrient banana special along with recommended dose of fertilizer application of major nutrients and use of banana bunch cover enhanced the yield in connection with the increased individual hand weight and average weight of bunch. The micronutrient helps in the metabolism and in the translocation of major nutrient to the source and produced photosynthesis from the source to sink. Additional secondary nutrients like Ca, Mg, and S which are present in the banana special would be the one of the additional benefits for the yield enhancement. Bagging the banana bunch with bunch cover in the particular stage i.e. when ridges appear on the individual fruit would be the reason for blemish less and good colour appearance which fetched good market price (Table 3 and 4).

Farmers who adopted theses technology was acknowledge that they got increase price in the market because of blemish less, good quality and high weight banana bunches.

**Table.1** Effect of banana special and bunch cover on average hand and bunch weight of Banana cv. G-9 and Yalakki

| Parameters                     | Parameter Assessed |       |            |               |       |            |                   |      |            |
|--------------------------------|--------------------|-------|------------|---------------|-------|------------|-------------------|------|------------|
|                                | 2018-19 (G-9)      |       |            | 2019-20 (G-9) |       |            | 2019-20 (Yalakki) |      |            |
|                                | Check              | Demo  | % increase | Check         | Demo  | % increase | Check             | Demo | % increase |
| Average weight of one hand (g) | 1.77               | 2.19  | 23.72      | 2.09          | 2.77  | 22.00      | 1.38              | 1.59 | 37.68      |
| Average weight of bunch (kg)   | 37.04              | 39.61 | 6.9        | 39.05         | 41.08 | 5.1        | 9.5               | 11.3 | 18.94      |

**Table.2** Effect of banana special and bunch cover on average yield of Banana cv. G-9 and Yalakki

| Year    | Crop   | Technology   | Variety        | Demo area (ha) | Farmers (No.) | Yield (q/ha) |       |              |
|---------|--------|--|----------------|----------------|---------------|--------------|-------|--------------|
|         |        |  |                |                |               | Check        | Demo  | Increase (%) |
| 2018-19 | Banana | Demonstration of Banana bunch grade and weight improvement   | G9             | 4              | 10            | 399.9        | 431.2 | 7.83         |
| 2019-20 | Banana | Demonstration of Banana bunch quality and weight improvement | G-9            | 0.8            | 2             | 429.0        | 458.5 | 6.87         |
|         |        |  | Yalakki Banana | 0.4            | 1             | 138.0        | 157.0 | 13.76        |

**Table.3** Effect of banana special and bunch cover on economics of Banana cv. G-9 and Yalakki

| Year         | 2018-19 |        |                    | 2019-20 |        |                    | 2019-20   |        |                    |
|--------------|---------|--------|--------------------|---------|--------|--------------------|-----------|--------|--------------------|
| Variety      | (G-9)   |        |                    | (G-9)   |        |                    | (Yalakki) |        |                    |
|              | Check   | Demo   | % increased income | Check   | Demo   | % increased income | Check     | Demo   | % increased income |
| Gross cost   | 149421  | 153080 | 11.64              | 135000  | 116000 | 18.71              | 180005    | 182000 | 32.20              |
| Gross return | 359919  | 388080 |                    | 375025  | 400950 |                    | 303600    | 345400 |                    |
| Net return   | 210498  | 235000 |                    | 240025  | 284950 |                    | 123595    | 163400 |                    |
| B:C ratio    | 2.41    | 2.53   |                    | 2.88    | 3.40   |                    | 1.69      | 1.90   |                    |

**Table.4**

|  |  |
|--|--|
| <p>G-9 banana Demonstration field</p>       | <p>G-9 banana ready to harvest</p>       |
| <p>Yalakki banana Demonstration field</p>  | <p>Yalakki banana ready to harvest</p>  |

Jagadeeswari *et al.*, (2018) during their study found that foliar application of banana special during fruit development stage resulted in increased banana productivity. Bindu in 2019 found that there was 20.6 t/ha yield in cv. Nendran due to application of micronutrient than from the farmers practice (14.8 t/ha).

An experiment conducted by Ravishankar and Jagadesh in 2014 to know the effect of bunch spraying of silicon and bunch bagging resulted in increased fruit weight, fruit length, fruit diameter, bunch weight and maximum shelf life. They concluded that increased bunch weight could be due to increased fruit size and hand number. According to Surajit Sarkar *et al.*, in 2016 bunch covered with nonwoven polypropylene bag resulted in

lower scaring beetle infection (1.8%), increased fruit weight, bunch weight and also shortened the harvest interval by 8 days. Amani and Avagyan in 2014 concluded that use of bunch cover reduced pitting, Tip end rot, brown spot and improved the quality characters of the fruits also. Rubel *et al.*, conducted experiment in 2019 showed that bunch covers required for higher bunch weight (19.90kg) and finger length (19.59 cm) and reduced day of harvest in cv. Mehesagar. Pathak *et al.*, 2017 stated that white colour non-Woven polypropylene bag has given highest finger length, finger weight intern resulted in increased hand and bunch weight and ultimately the yield in cv., Jahaji in Jorhat.

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