EFFECT OF PLANT GROWTH REGULATORS AND MICRONUTRIENTS ON GROWTH, YIELD, AND STORAGE LIFE OF BANANA (MUSA SPP) CV. ARDHAPURI*

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ABSTRACT

A field experiment was conducted to find out the effect of growth substances, micronutrients and waxol on growth, yield, and storage life of banana (Musa spp) cv. Ardhapuri. Higher concentrations of IAA (80 ppm), GA3 (80 ppm) and micronutrients mixture 1% two spray enhanced the height (179.21 cm), pseudostem girth (67.29 cm) and number of leaves (14.15). Early maturity (106.00 days) was with micronutrients mixture 1% (two sprays) and IAA 80 ppm delayed the maturity. The number of days required for ripening was found higher with waxol 6% (20.50 days) and the lowest in control. Maximum weight of bunch (22.76 kg), number of hands (9.25) and fingers (133.25) were recorded by IAA 80 ppm. Maximum length (21.95 cm) and girth (16.20 cm) of finger was recorded in micronutrient mixture 1% with two sprays. Maximum weight of mature finger (178.25 g) was found with GA3 80 ppm. It is found that application of IAA @ 80 ppm, GA @ 80 ppm and two sprays of micronutrients 1% were effective for plant growth, size and weight of finger, whereas waxol 6% was found effective in enhancing the keeping quality.

Banana musa spp is one of the most important fruit crops grown in India. It is dessert fruit for millions and is used in different regions as staple food owing to its rich and easily digestible carbohydrates. It is rich source of vitamins, minerals and has several medicinal properties. The edible banana is believed to have originated in hot tropical regions of South-East Asia (Spiden, 1926 and Suar, 1952). It is grown across the country in tropical and subtropical region. In Maharashtra total area under banana is 72.20 thousand ha and production is 4.45 million tones. The productivity of banana is 60.00 tonnes ha⁻¹ being highest in the country (Anonymous, 2001). In India, people prefer fresh fruits instead of canned products. The economics of banana cultivation depends on the cost of transportation and storage. However, low shelf life and bad transportability are two major problems in case of banana. It is generally harvested when green between 70 to 100 per cent maturity and ripened before consumption (Paul Thomson et al. 1968). Pre harvest and post harvest handling of banana fruits is an important aspect of banana trade. Early and even maturity of bunches are the immediate needs of the banana growers of the region. In view of the above an investigation was conducted to find out the effect of plant growth substances and micronutrients on growth, quality and storage life of banana cv. Ardhapuri.

A field experiment was conducted at College of Horticulture, Marathwada Agricultural University, Parbhani during 2002-2003. The experiment was laid out in randomized block design with 8 treatments, viz. T₁- Control, T₂- GA₄₀ ppm, T₃- GA₈₀ ppm, T₄- IAA _₄₀ ppm, T₅- IAA _₈₀ ppm, T₆- micronutrients mixture 1%one spray, T₇- micronutrients mixture 1%two spray and T₈- waxol 6%.

All recommended cultural practices were followed after planting of banana. The stock solutions of IAA and GA, were prepared by dissolving 1 g of respective growth regulator in 50 ml alcohol and distilled water was added to make volume to 1 lit. The required concentration of micronutrients mixture were prepared by directly mixing required quantity of micronutrient mixture in water and those spray solutions were used for spraying immediately after preparation. Spray was given at flag leaf stage i.e. just before flowering by using a hand sprayer. Growth regulators and micronutrients mixture were sprayed on leaves of both the sides of plant.

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Precautions were taken to avoid the drizzling of the sprays on the other treatments. After harvesting the banana, bunches were completely dipped in 6% waxol solution for 30 to 40 seconds. Observations were recorded regularly and statistically analysed as per the methods given by Panse and Sukhatme (1967).

Effect on growth, maturity and ripening: It is evident from the data in Table 1 that there was significant effect of plant growth regulators and micronutrients regarding days to harvesting from flowering and days to ripening from harvesting. Non significant influence was noticed in plant height, girth of pseudostem and days to flowering from planting. The highest height of plant (179.21 cm), girth of pseudostem (67.29 cm), number of leaves per plant (14.15) and minimum days from planting to flowering was recorded due to application of GA3 @80 ppm (260.00) at flag leaf stage. It was followed by 1% micronutrient mixture 1% two sprays (176.80 cm), one spray (174.40 cm), GA3 80 ppm (172.98 cm), IAA 40 ppm (175.99 cm), IAA 80 ppm (179.21 cm) and control (162.60 cm). The lowest values of these attributes are recorded in control. Early maturity (106 days after flowering) and early ripening (9.75 days after harvesting) was observed due to application of two sprays of 1% micronutrient mixture. However, it was on par with all the treatments. The maturity was delayed with the application of IAA 80 ppm (128.00 days). The treatments GA3, 80 ppm (121.00 days) and IAA 40 ppm (126.00 days) were found on par with GA3, 40 ppm (118.25 days). These results were in confirmation with findings of Narayana and Reddy (1968) on grape, Jadhav and Kadam (1990), Ghanta and Mitra (1993), Pertin and Das (1996), while working on banana.

The data presented in Table 1 showed that the treatment differences were found significant. Micronutrient mixture 1% two sprays (9.75 days), one spray (10.00 days) and control (10.75 days) reduced the time required for ripening. Highest period required for ripening (storage life) was found with waxol 6% (20.50 days) which was superior over all the treatments. Similar results were reported by (Jadhav and Kadam, 1990) and (Chellapan, 1983), (Sarkar, et al. 1995).

Effect on yield and finger attributes: The data presented in Table 2 showed the results pertaining to weight of bunch. The highest bunch weight was obtained with IAA 80 ppm (22.76 kg) which was statistically similar to micronutrient mixture 1% two sprays (20.95 kg), GA3 80 ppm (20.82 kg), IAA 40 ppm (19.59 kg), GA3 40 ppm (19.49 kg) and minimum was recorded in control (16.29 kg). The data presented in Table 2 showed the results pertaining to weight of bunch. The highest bunch weight was obtained with IAA 80 ppm (22.76 kg) which was statistically similar to micronutrient mixture 1% two sprays (20.95 kg), GA3 80 ppm (20.82 kg), IAA 40 ppm (19.59 kg), GA3 40 ppm (19.49 kg) and minimum was recorded in control (16.29 kg).
IAA 80 ppm recorded highest number of hands per bunch (9.25) which was statistically similar to GA3 80 ppm (8.50) and the lowest was recorded in control. Maximum number of fingers per bunch was recorded with IAA 80 ppm (133.25) and minimum was found in control (109.00). The maximum length of finger was found with two sprays of 1% micronutrient mixture (21.95 cm) followed by IAA 80 ppm (21.75 cm) and GA3 80 ppm (21.75 cm) and the lowest was recorded in control. The maximum girth of finger was recorded in micronutrient mixture 1% with two spray (16.20 cm) followed by IAA 80 ppm (16.00 cm) and minimum was found in waxol 6% and control.

Maximum increase in weight of mature finger was found in two sprays of 1% micronutrients mixture (178.25 g), micronutrients mixture 1% one spray (171.25 g), IAA 80 ppm (170.87 g) and GA3 80ppm (170.37 g) which were at par with each other. Minimum weight of finger was recorded in control. Increasing in yield by application may be due to growth promoting properties of these chemicals. Similar results were reported by Parmar and Chundawat (1981), Chattopadhyay and Jana (1982), Ghanta and Dwivedi (1993) and Ghanta and Mitra (1993).

**REFERENCES**


