
Effect of Cutting Height of the Harvested Mother Plant Pseudostem on Growth and Yield of the Following Sucker in Embul Banana (*Musa acuminata*)

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Abstract

A field experiment was conducted during 2008-2010 at Fruit Crop Research Development Centre, Horana Sri Lanka to study the effect of the cutting height of recently harvested parent pseudostem on growth and yield of the following sucker of Embul banana. Treatments consisted of four cutting heights from the ground surface (200 cm, 100 cm, 10 cm and 0 cm) at the time of mother plant harvest. Pseudostem with cutting heights of 200 and 100 cm gave significantly ($p < 0.05$) higher values of plant height and stem girth of following sucker compared with cutting low (10 cm) and totally eliminated mother plant pseudostem. The cutting height of 200 cm increased bunch weight by 1.39 kg (9.3 %) and decreased the time to harvest by 14.5 days (2.9 %) compared with totally eliminated pseudostem. The increase of bunch weight resulted from an increase with the number of fingers/bunch. However there is no significant level difference for bunch weight with the cutting height of 100 cm. The length and girth of fingers were not affected by the treatments.

Key words: Banana, Growth, Pseudostem, Height, Yield.

Introduction

Banana is one of the most important, popular fruit crop and widely consumed fruit with a year round production grown in Sri Lanka. Embul (Mysore, AAB) has the highest demand for cultivation. Average banana yield in Sri Lanka is about 8.2 Mt/ha (Anonymous 2011) and it is very far from the world average of 21.40 Mt/ha (FAO 2012). Poor crop management practice is one of reason for this low yield. Therefore, advanced production technologies should be practiced to increase the yield. Growth of the ratoon crop is influenced by reserves and water supply from the remaining part of parent pseudostem. Furthermore residuals of mother plant enrich the following sucker and removing of mother plant is laborious work. Hence this experiment was initiated at the Fruit Crop Research Development Centre, Horana during 2008-2010 to evaluate the effect of the cutting height of the parent pseudostem on growth and yield of the following sucker in banana.

Material and Methods

Healthy and equal size of suckers of Embul banana from FCRDC, Horana, were first cleaned, disinfected with a mixture of fungicide (captan) and insecticide (carbofuran) and planted in a Randomized Completed Block Design with four replicates. Suckers were planted

at a spacing of 3 m X 3 m and three plants were maintained in a plot. Treatments consisted of four cutting heights from the ground surface (200 cm, 100 cm, 10 cm and 0 cm-control) at the time of mother plant harvest. The recommended fertilizer dose and other necessary crop management practices were performed during plant growth of all treatments as per the Departmental recommendation. Growth and yield parameters of tested banana plants were recorded for ratoon crop (second crop). At flowering, records were taken of stem height (from soil level to the point where the two highest petioles meet each other and girth of stem (cm). Girth of stem was measured at 30 cm above the ground level. At harvest, the bunch weight, number of hands, and number of fingers, girth and length of fruit were taken as yield components. The maximum length and girth of 3 fruits from the middle part of second hand was measured separately and average was calculated. Days from planting to harvest were also recorded. The data on various aspects in the present investigation were compiled and statistical analysis was performed using SAS package (SAS 1989). Means were separated using Least Significant Difference (LSD) value at 5 % significant level.

Table 1: Yield and growth performances of the ratoon crop of Embul banana variety at FCRDC, Horana

Treatment	Maturity Age (days)	Stem Height (cm)	Stem girth (cm)	Bunch weight (kg)	No of hands	No of fingers	Fruit weight (g)	Fruit length (cm)	Fruit girth (cm)
T1-(0 cm)	509.7 ^a	278.7 ^b	57.7 ^b	14.8 ^b	11.2 ^b	191.0 ^b	90.7	11.5	12.3
T2-10cm	501.0 ^{ab}	272.2 ^b	58.7 ^b	15.0 ^b	11.5 ^{ab}	195.3 ^b	88.7	11.1	12.4
T3-100 cm	499.2 ^{ab}	318.2 ^a	65.2 ^a	15.4 ^{ab}	11.5 ^{ab}	196.5 ^b	89.7	10.9	12.0
T4-200 cm	495.2 ^b	324.2 ^a	66.5 ^a	16.2 ^a	12.5 ^a	218.8 ^a	91.0	11.3	12.1
LSD(0.05)	11.5	18.3	3.25	1.10	1.00	22.25	NS	NS	NS

NS $p > 0.05$, Values in a column having different superscripts are significantly different at the 5% level.

Result and Discussion

The results revealed that there are significant differences ($p < 0.05$) between treatments with regard to maturity age, stem girth, stem height, bunch weight, number of hands and number of fingers (Table 1). Considering the size of fingers; weight, length and girth of fruit were not affected by the different treatment Pseudostem with cutting height of 200cm showed earlier flowering for next ratoon crop compared with mother plant pseudostem was totally eliminated. It was 14.5 days earlier than the control. The highest height and girth of second crop was recorded in the 200 cm cutting height of parent pseudostem which was 16.32 and 15.15 percent significantly higher over the control, respectively. Rodriguez et al (2006) have shown similar results. However, it was at par with the treatment of 100 cm cutting height of parent pseudostem. Earlier maturity or shorter production cycle and bigger girth allow reducing of losses from wind damage. It was evident that the weight of bunch due to the application of high level cutting of parent pseudostem was significantly affected (Table 1). The cutting height of 200 cm increased bunch weight by 1.39 kg (9.3 %). The increase in bunch weight resulted from an increase in the number of fingers per bunch. It also confirmed with the findings of Daniells and O'Farrell (1987). Both farmers and researchers agree that residues of mother plant are beneficial for plant growth.

The results of the present study reveal that there is an influence of mother plant pseudostem on the growth and yield of following sucker. It is important to mention that crop sanitation need to be carried out with this practice. Vigorous growth of ratoon sucker may be caused by reserves and water supply from remaining part of mother plant pseudostem.

References

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