

EFFECT OF NUMBER OF SUCKER PER HILL ON GROWTH AND YIELD ON BANANA IN A RATOON CROP

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(Received April 4, 1990; revised June 26, 1993)

To increase banana yield, more than one sucker per hill was planted with proportionate increase of fertilizers. The results showed that the girth of pseudostem decreased at harvest, but the height of individual plant increased significantly with the increase in number of suckers per hill. The yield as well as the sucker production ability of the individual plant diminished markedly as the number of sucker per hill was increased. Days to bunch shooting and harvesting also increased significantly when more than one sucker was retained per hill. The highest yield (45.86 t/ha) was obtained with two suckers per hill which was more than 50% higher than that (30.04 t/ha) obtained from the conventional single sucker planting system. There was no significant difference in the total yield when one and three suckers were retained per hill.

Key words: Banana, Sucker, Ratoon crop, Growth, Yield.

Introduction

In the recent years considerable efforts have been made by the Government of Bangladesh to double food production in the country by 1992. As part of such an effort the present work was undertaken to double the yield of banana by planting more than one sucker per hill with proportionate increase in the amount of fertilizers needed for two and three suckers plant per hill.

Banana may be regarded as the number one fruit of Bangladesh for its total hectareage and production [1]. Moreover, it is abundantly available all throughout the year. Ahmad and Matin [2] indicated that clump planting was useful for increasing the yield of banana. Recently Haque [3] discouraged clump planting of banana for its commercial cultivation. The main weakness of Haque's study [3] was that he did not increase the amount of fertilizers proportionately when more than one sucker was planted per hill but used the same doses of fertilizers for the single as well as for multiple suckers planted per hill.

Materials and Methods

The experiment was carried out at the Horticulture Farm of Bangladesh Agricultural University, Mymensingh during the period from September to December 1989. The experiment followed a randomized complete block design with three replications. The experiment had three treatments, one sucker per hill, two suckers per hill and three suckers per hill. Three month-old sword suckers of uniform size cv. Amritsagar were planted on 1 October 1987 following hexagonal system of planting at a spacing of 2.2m from plant to plant. The size of each unit plot was 8.8x7.7 m². In the following year, uniform suckers were kept per hill as per treatment. The following doses of manures and fertilizers were applied to the crop.

Treatment	Cowdung (kg)	Mustard oil cake (g)	Urea (g)	Triple super phosphate (g)	Muriate of potash (g)
1 plant/hill	10	500	250	200	230
2 plants/hill	20	1000	500	400	460
3 plants/hill	30	1500	750	600	690

The whole quantity of triple superphosphate (TSP), cowdung and mustard oilcake and one-third of urea and muriate of potash (MP) were applied around the plant soon after harvesting the previous crop. One third of the remainder urea and MP were applied around the plant in three equal instalments at an interval of two months beginning from one month after first application. Other cultural operations were carried out following Mondal and Roy [4]. Data were recorded on girth at base of pseudostem, height of the plant, number of leaves produced up to bunch shooting. The bunches were harvested at maturity. Data were also recorded on yield components viz. number of hands per bunch, number of fingers per hand and weight of bunch. Ten plants were selected at random for collecting experimental data. The collected data were statistically analyzed to examine the treatment effects on different characters using the analysis of variance technique and the treatment differences were adjudged by using the least significant difference test (LSD).

Results and Discussions

Vegetative growth of plant. At the early stage of growth there was little effect on the girth of pseudostem for retaining different number of suckers per hill. However, girth variation became significant during the later stages of growth of the banana plants (Table 1). The height of the pseudostem varied significantly at the age of six months and at the time of

harvesting. The plants became taller as the number of suckers retained per hill was increased. The plants with single sucker per hill produced 12.49 suckers whereas only 6.97 suckers per plant were produced when three suckers were kept per hill. The results of the present study agree with those of Haque [3]. Table 2 shows that at the time of shooting the leaf number was higher for the single plant per hill but this variation in leaf number was not significant upto six months. The pattern of retention of leaves at harvest followed more or less the same trend as observed at shooting. There was a highly significant difference in the number of total leaves produced during the life time of banana plants (Table 2). The total number of leaves

produced by the plants during the whole life time was higher in single plantings, but gradually decreased as the number of suckers per hill was increased.

Days to bunch shooting and harvesting. Bunch shooting as well as harvesting and maturity of bunch greatly delayed as the number of suckers per hill was increased (Table 3) but not to the extent as reported by Haque [3]. With more than one sucker per hill, the harvesting lasted longer since the cold weather had set in by November.

Yield components and yield. The yield components such as number of hands and fingers per bunch, mean weight of hands and fingers and mean bunch weight followed more or

TABLE 1. EFFECT OF NUMBER OF SUCKER PER HILL ON GIRTH AND HEIGHT OF PSEUDOSTEM AND THE NUMBER OF SUCKERS PRODUCED PER PLANT.

Treatment	Girth of pseudostem (cm)		Height of pseudostem (cm)		No. of suckers produced per plant
	at 6 months	at harvest	at 6 months	at harvest	
1 plant/hill	45.26	59.49	180.5	228.1	12.49
2 plants/hill	44.37	55.23	187.3	228.1	10.15
3 plants/hill	43.51	51.46	191.7	257.4	6.97
LSD (0.05)	2.13	3.64	5.79	6.49	2.25

TABLE 2. EFFECT OF NUMBER OF SUCKER PER HILL ON NUMBER OF LEAVES PRESENT PER PLANT.

Treatment	No. of leaves present/plant			Cumulative total
	at 6 months	at bunch shooting	at harvest	
1 plant/hill	12.02	15.36	10.25	30.25
2 plants/hill	11.41	14.18	8.97	28.37
3 plants/hill	10.84	13.25	7.93	25.19
LSD (0.05)	1.15	1.24	1.57	1.96

TABLE 3. EFFECT OF NUMBER OF SUCKER PER HILL ON NUMBER OF DAYS TO BUNCH SHOOTING, DAYS TO HARVESTING, DAYS FROM SHOOTING TO HARVEST AND HARVESTING PERIOD.

Treatment	Days to bunch shooting	Days to harvesting	Days from shooting to harvest	Harvesting period
1 plant/hill	256.4	344.5	88.1	late Sep.-Oct.
2 plants/hill	270.9	367.4	96.5	Oct.-Early Nov.
3 plants/hill	294.4	399.7	105.2	Lat Oct.-Mid Dec.
LSD (0.05)	10.85	11.37	4.38	

TABLE 4. EFFECT OF NUMBER OF SUCKER PER HILL ON YIELD COMPONENTS AND YIELD OF BANANA.

Treatment	Mean number of hands/bunch	Mean fingers/bunch	Mean hand wt. (kg)	Mean finger wt. (kg)	Mean bunch wt. (kg)	Mean yield (t/ha)
1 plant/hill	6.14	74.25	2.06	170.5	12.65	30.04
2 plants/hill	5.42	67.30	1.78	143.4	9.65	45.86
3 plants/hill	4.93	51.58	1.00	95.6	4.93	35.19
LSD (0.05)	0.86	4.29	0.36	6.79	1.58	8.73

less the same general pattern but gradually declined with the increase in the number of sucker per hill (Table 4). Findings of the previous studies [3,5] also support the present results. The yield per hectare was found to be significantly different for different treatments. A maximum of 45.86 t/ha of banana was obtained in the present experiment with two suckers per hill. The yield of the single plant per hill in the present experiment closely followed the yield of Shil and Mondal [6] who reported to have obtained 33.2 t/ha of banana in the conventional single plant per hill system. On average, an yield increase of more than 50% was recorded when two plants per hill were retained. The yield per hectare was 35.19 t/ha for three plants per hill, not significantly higher than that of a single plant per hill but lower than that of two plants per hill. Although the total yield in the case of three suckers per hill was higher than that of the normal planting, it may not be advisable to allow three plants per hill because with three plants per hill, the fingers were smaller and the harvesting season was unusually long. Echeverri-Lopez and Garcia-Reyes [7] in their experiment obtained the highest yield with three suckers per hill at a spacing of 4x4 m², but they recommended two suckers per hill because of the quality of the fingers. Azouz *et al.* [8] out of their experiments recommended two suckers per hill at a spacing of 2x3 m² and three suckers per hill at the spacing of 3x3 or 3x4 m², although there were marked varietal differ-

ences in the yield of banana.

From the results of the present experiment and the above discussions it may be recommended that planting two suckers per hill with proportionate increase in the fertilizer doses per hill should be practised for commercial banana production. However, further studies are necessary to standardize this new technology with regard to spacing and fertilizer doses per hill.

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