

Economics of banana production in drip irrigated and flood irrigated gardens

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ABSTRACT

Investigation was carried out during the year 2008-2009. Forty eight drip irrigated and forty eight flood irrigated banana growers were randomly selected from eight villages of Ardhapur tehsil of Nanded district in Maharashtra for the study. Cross sectional data were collected from the banana growers with the help of pretested schedule by personal interview method. The cost concept of cost-A, cost-B and cost-C was used to analyze the data. The results revealed that per hectare use of irrigation was higher as 20000 cubic meters in flood irrigated garden while that was 13999.57 cubic meters in drip irrigated garden. It inferred that there was water saving in drip irrigated garden due to drip system. Per hectare main produce of banana fruit was 231.46 quintals in drip irrigated banana garden followed by 213.89 quintals in flood irrigated banana garden. Per hectare gross return was Rs. 126607.73 in drip irrigated banana garden followed by Rs. 116917.80 in flood irrigated banana garden. Cost-C was lower as Rs. 81108.33 in drip irrigated garden while it was Rs. 83413.13 in the flood irrigated garden. Per hectare net profit was higher as Rs. 45499.40 in drip irrigated garden than that of Rs. 33504.67 in flood irrigated garden. Per quintal cost of production was lower in drip irrigated garden due to drip irrigation system.

Key words : Banana, Drip irrigated, Flood irrigated, Production, Profit

Banana (*Musa paradisiaca* L.) is one of the leading tropical fruit crops. It ranks next to mango in both area and production in India. Nanded district of Maharashtra has favorable climate to grow banana varieties like Basrai and Ardhapuri. The district has medium to heavy black cotton soil. The average rainfall of district is 1533 mm. Drip irrigation for banana crop is water saving technology. Deoghare *et al.* (1999) showed that drip irrigation system is low cost for banana production and higher profitability over conventional irrigation system. The result revealed that per quintal cost of production in drip irrigation system was Rs. 113.8 while that was Rs. 122.93 in conventional irrigation system. Farmers are giving top priority to banana crop in the cropping pattern where the irrigation facilities are available. It requires heavy dose of fertilizers and manure. It is capital intensive crop. By keeping in view the above aspects, the present study was undertaken in order to know the effect of both drip irrigation and flood irrigation systems on the profitabilities of banana cultivation.

METHODOLOGY

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Multistage sampling design was used in selection of district, tehsil, villages and banana gardens. In first stage, Nanded district of Maharashtra was selected purposely because of favourable climate to grow banana crop. In the second stage, Ardhapur Tehsil was selected on the basis of highest area under banana crop. In the third stage, eight villages were selected from the Tehsil on the basis of area under both drip irrigated as well as flood irrigated banana gardens. The selected villages were namely, Ardhapur, Degaon, Lahan, Loni(Bu), Loni(kh), Malegaon, Panghari and Pardi. In the fourth stage, six drip irrigated and six flood irrigated banana gardens were randomly selected from each of the selected villages. Thus, from eight villages, forty eight drip irrigated and forty eight flood irrigated banana gardens were selected for the study. The cross-sectional data were collected from forty eight drip irrigated and forty eight flood irrigated banana growers by personal interview method with help of pretested schedule for the year 2007-08.

Cost concept of cost-A, cost-B and cost-C was used to analyse the data. Evaluation of cost items was as follows: One man day consisted with 8 hours of work. Labour cost was evaluated at the rate of Rs. 80 per day for male and Rs. 60 per day for female. The female labour was converted into man day by multiplying to number of female with 0.75. Bullock labour charge was Rs.150 per pair day for eight hours of work. Machine labour was evaluated at the rate of 270 per hour. Banana sucker was purchased for Rs.10 per sucker. The rate prevailing in the market for nitrogen, phosphorus and potash was

Rs. 10 per kg, Rs. 22.25 per kg and Rs. 8.33 per kg, respectively. One cartload of manure was considered as four quintals and its prevailing price was Rs. 50 per quintal. Interest on working capital was calculated at the rate of 10 per cent. Depreciation on fixed capital asset was calculated at the rate of 10 per cent. Rental value of land was estimated as $1/6^{\text{th}}$ of gross income minus land revenue. Interest on fixed capital was calculated at the rate of 12 per cent on the asset.

FINDINGS AND DISCUSSION

The findings obtained from the present study are presented in Table 1, 2 and 3.

Physical inputs and outputs in banana production:

Per hectare physical inputs and outputs in tissue culture banana production under drip and flood irrigated system were estimated and are presented in Table 1. Use of hired human labour was the higher as 45.65 man days in flood irrigated banana garden than that of 41.80 man days in drip irrigated banana garden. Use of bullock labour was 6.31 and 3.08 pair days in flood and drip irrigated banana gardens, respectively. On the contrary,

use of machine labour was higher as 4.83 hours in drip irrigated banana garden while that was 3.71 hours in flood irrigated banana garden. It inferred that more mechanization was found in drip irrigated banana garden as compared to flood irrigated banana garden. The use of banana sucker was higher as 1971.71 in numbers in flood irrigated banana garden followed by that of 1793.81 in numbers in drip irrigated banana garden. In regard to manure, the higher quantity of 48.90 quintals was used in flood irrigated banana garden than that of 46.58 quintals in drip irrigated banana garden. Use of nitrogen, phosphorus, and potash was slightly higher as 225.42, 216.27, and 118.10 kg, respectively in flood irrigated banana garden while use of nitrogen, phosphorus, and potash was 202.18, 194.06 115.42 kg, respectively in drip irrigated banana garden. It implied that there was reduction in the use of fertilizers due to drip systems because there might be less leaching of fertilizers. Use of plant protection under both system was more or less same ranging from 0.10 liter and 0.11 liter in flood irrigated banana garden. Use of irrigation was higher as 20000.00 cubic meter in flood irrigated banana garden while that was 13999.57 cubic meter in drip irrigated banana garden. It inferred that there was water saving in drip irrigated banana garden due to drip system. Use of family human labour was higher (49.84 man days) in drip irrigated banana garden followed by 28.16 man days in flood irrigated banana garden. It implied that there was need of skilled labour in drip system which could be fulfilled by family labour. It was also observed from the table that main produce of banana was 231.46 quintals in drip irrigated banana garden followed by 213.89 quintals in flood irrigated banana garden. It implied that under drip irrigated system, yield of banana was higher than that of flood irrigation system. Similarly, by produce in the form of sucker was also higher as 814.10 in numbers in drip irrigated garden while that was 736.43 in numbers in flood irrigated garden.

Table 1 : Per hectare physical inputs and outputs of banana production in drip irrigated and flood irrigated banana gardens

Sr. No.	Particulars	Unit	Drip irrigated banana garden	Flood irrigated banana garden
Input				
1.	Hired human labour	Man day	41.80	45.65
2.	Bullock labour	Pair day	3.08	6.31
3.	Machine labour	Hour	4.83	3.71
4.	Banana sucker	No.	1793.81	1917.71
5.	Manures	q	46.58	48.90
6.	Nitrogen	kg	202.18	225.42
7.	Phosphorus	kg	194.06	216.27
8.	Potash	kg	115.42	118.10
9.	Plant protection	lit	0.10	0.11
10.	Irrigation	m ³	13999.57	20000.00
11	Family human labour	Man day	49.84	28.16
Output				
1.	Main produce (fruit)	q	231.46	213.89
2.	By produce (sucker)	q	814.10	736.46

Cost of cultivation of banana production:

Per hectare cost of cultivation of banana under drip and flood irrigation systems were calculated and are presented in Table 2. The results revealed that cost-C was higher as Rs.83143.13 in the flood irrigated garden while that was Rs.81108.33 in the drip irrigated garden. Among the various items of expenditure, the share of rental value of land was predominant as 25.78 per cent followed by sucker (22.12 per cent) and irrigation (21.58 per cent) in drip irrigated banana garden. In case of flood irrigated banana garden, share of expenditure on irrigation was 23.98 per cent followed by rental value of land (23.15