

Resource productivity and resource use efficiency in drip irrigated banana production

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ABSTRACT

Banana (*Musa paradisiaca* L.) is one of the most important fruit crops in the world. It ranks next to mango in both area and production in India. About 48 drip irrigated banana growers were randomly selected for the study. Cross sectional data were collected from the banana growers with the help of pretested schedule by personal interview method. The study was conducted to know the resource productivity, resource use efficiency and optimum resource use in banana production. Cobb-Douglas production function was fitted to the data. The results revealed that the regression coefficient of machine labour, irrigation and area under banana was 0.054, 0.203 and 0.213, respectively which were positive and significant. Marginal productivity with respect to area, bullock labour and machine labour was 51.291, 2.759 and 2.746 quintals, respectively. It inferred that if area is increased by one hectare, bullock labour increased by one pair and machine labour increased by one hour, it would lead to increase banana production by 51.291, 2.759 and 2.746 quintals, respectively. The sum of the production elasticities ($\sum b_i$) was 0.576 which indicated decreasing return to scale.

INTRODUCTION

Banana (*Musa paradisiaca* L.) is one of the cheapest fruit and is a rich source of energy in the form of sugar and starch. It ranks next to mango in both area and production in India. Nanded is one of the districts of Maharashtra where banana has been grown on large scale with Basrai and Ardhapuri varieties. Nowadays, farmers are using drip irrigation system in banana production in order to overcome the problem of scarce water resource. Due to this system, fertilizers can be applied to the crop. In this system, farmer is also facing the problem of management of resources. In order to minimize the over and under utilization of resources, the present study has been undertaken to determine the optimum utilization of the resources in drip irrigated banana production.

METHODOLOGY

Multistage sampling design was used in selection of district, tehsil, villages and banana gardens. In first stage, Nanded district in 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 drip

irrigated banana gardens. In the fourth stage, six drip irrigated banana gardens were randomly selected from each of the selected villages. Thus, from eight villages, forty eight drip irrigated banana gardens were selected for the study. The cross-sectional data were collected from forty eight drip irrigated banana growers by personal interview method with help of pre-tested schedule for the year 2007-08. Use of resources namely, area of banana, hired human labour, machine labour, nitrogen, phosphorus, potash and manures on farm were taken into consideration. Cobb-Douglas production function was to be the best fit to data to estimate the resource productivity with respect to each of the explanatory variables. The fitted equation was as follows:

$$Y = aX_1^{b_1} \times X_2^{b_2} \times X_3^{b_3} \dots X_n^{b_n} \cdot e^u$$

In this functional form 'Y' is dependent variable, 'X_i' are independent resource variables, 'a' is the constant representing intercept of the production function and 'b_i' are the regression coefficients of the respective resource variables. The regression coefficients obtained from this function directly represent the elasticities of production, which remain constant throughout the relevant ranges of inputs. The sum of coefficients that is 'bi' indicates the nature of returns to scale. This

Key words :

Banana,
regression,
Coefficient,
Optimum
resource,
Marginal product,
Drip irrigated

Accepted :
January, 2010