Resource productivity and resource use efficiency in pearl millet production

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ABSTRACT

Pearl millet (*Pennisetum typhoids*) popularly known as *bajra*. India is the largest producer of pearl millet crop. The study was conducted to know the resource productivity, resource use efficiency and optimum resource use in pearl millet production. Cobb-Douglas production function was fitted to the data. The results revealed that the regression coefficients of bullock labour (0.181), area (0.330) and family human labour (0.112) were positive and significant. It revealed that these resources when increased by one per cent each, that led to increase the production of pearl millet grain by 0.181, 0.330 and 0.112 per cent, respectively. Use of bullock labour was optimum as 8.99 pair days followed by area (0.58 ha) and family human labour (10.42 man days). The sum of the production elasticities (Σbi) was 0.80 which indicated decreasing return to scale.

Key words : Pearl millet, Resource productivity, Regression coefficient, Use, Marginal product.

Pearl millet (*Pennisetum typhoids*) belongs to the family Graminaceae. The origin has been traced to the tropical Africa. Pearl millet is the sixth most important cereal crop after wheat, rice, maize, barley and sorghum in the world as one of the millet crop. It was introduced in India from Africa. India is the largest producer of pearl millet crop. In the country major pearl millet growing states are Rajastan, Maharashtra, Gujarat and Andhra Pradesh. Maharashtra State is the third largest and second in respect of area under pearl millet. In these state ofo Maharashtra Nasik, Beed, Satara, Sangli, Solapur, Dhule and Jalgaon are the important bajra growing districts. Millet is nutritionally superior to rice and comparable in many respects with wheat. Pearl millet is rich source of iron. The increased demand may lead increase in prices of pearl millet and the farmers may be benefited. The need was felt to answer certain queries such as resources and their optimal use. Keeping in view these aspects, the study has been undertaken.

METHODOLOGY

Multistage sampling design was adopted for selection of the district, Tehsil, villages and farmers. At the first stage, Beed district was purposively selected for present study because of higher area under pearl millet. At the second stage, Georai tehsil was purposively selected from Beed district because of higher area under pearl millet. At the third stage, eight villages from Georai Tehsil were selected randomly having pearl millet crop. At the fourth stage, the list of pearl millet growers was obtained from all the 8 villages. From each village, twelve farmers were randomly selected. In this way, ninety six pearl millet growers were selected for present study. Cross sectional data were collected from the sample farmers by personal interview method with the help of pretested schedule. Data were related to inputs with their prices and the produce with monetary returns for the year 2008-09. Resources namely, area of pearl millet, hired human labour, family human labour, bullock labour, machine labour, seed, nitrogen, phosphorus, potassium and manures on farm were taken in the study.

Cobb-Douglas production function was found to be the best fit to the data to estimate the resource productivity and resource use efficiency and optimum resource use with respect to each of the explanatory variables. The fitted equation was as follows:

$$Y = aX_1^{b_i} \cdot X_2^{b_2} \cdot X_3^{b_3} \cdot X_4^{b_4} \cdot X_5^{b_5} \cdot X_6^{b_6} \cdot X_7^{b_7} \cdot X_8^{b_8} \cdot e^u$$

where, Y= Production of pearl millet in quintals per farm, a = Intercept of production function, bi = Partial regression coefficients of the respective resource, X_1 = Area of the crop in hectares per farm, X_2 = Hired human labour in man day per farm, X_3 = Bullock labour in pair day per farm, X_4 = Machine labour in hours per farm, X_5 = Nitrogen in kg per farm, X_6 = Phosphorus in kg per farm, X_7 = Potash in kg per farm, X_8 = Manure in quintals

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