RESEARCH PAPER International Journal of Agricultural Sciences, June to December, 2009, Vol. 5 Issue 2 : 450-452

Resource productivity, resource use efficiency and optimum resource use in rose flower production

S.G. INGLE, B.R. PAWAR*, J.B. TAWALE AND S.A. JAGDE
Department of Agricultural Economics and Statistics, Marathwada Agricultural University, PARBHANI (M.S.) INDIA

ABSTRACT

Rose (***Rose domascence***) **is popular species of rose, belong to family *roseaceae*. It is important commercial flower. Investigation was carried out for the year 2005-06 in order to study the marginal productivity, economic efficiency and optimum resource use in rose production in Nanded district of Maharashtra. Results revealed that regression coefficient of nitrogen (0.018), manure (0.103) and pesticide (0.028) were highly significant at 1 per cent level while regression coefficients of phosphorus (0.025), potash (0.008), irrigation (0.108) were positive and statistically significant at 5 per cent level. Thus it was inferred that these resources were under utilized and there was scope to increase them in rose production. The ratios of MVP to price with respect to above resources were higher than unity. Optimum resource use, where value of the additional product would be equal to the cost of additional resource.**

Key words : Marginal product, Resource use efficiency, Optimum resource

INTRODUCTION

These days flower cultivation occupies an important position in India particularly in the big cities. The major flower growing states in India are Tamilnadu, Karnataka, Maharashtra, West Bengal, Uttar Pradesh, Rajasthan and Haryana. In these states rose is mainly grown as traditional flowers. Rose is mainly cultivated in Nanded district on commercial scale. The present investigation, therefore, has been devoted to determine resource productivity, resource use efficiency and optimum resource allocation in rose production.

MATERIALS AND METHODS

Multistage sampling technique was used to select district, tehsil and villages. In the first stage, Nanded district was selected purposively. In the second stage, on the basis of the higher area under rose flower, Bhokar and Nanded tehsils were selected for present study. In the third stage, six villages were selected from tehsils on the basis of their highest area under rose flower crop. In the fourth stage, from each village list of rose flower growers with area of rose flower crop was obtained. Obviously three flower grower were selected from each of the villages. Thus, thirty six rose growers were selected for the investigation. Cross sectional data were collected from thirty six rose growers by personal interview method with the help of pretested schedule. Data pertained to production of rose from each flower grower and use of resources namely area under rose garden, labour, bullock labour, nitrogen, phosphorus, potash, manure, pesticide and irrigation for the year 2005-06 with the help of correlation matrix of the above variables, independent variables which were significant with respect to dependent variables were taken into consideration. Thus, these independent variables were included in both the linear and Cobb-Douglas functions. On the basis of goodness of fit (R^2). Cobb-Douglas production function was found to be the best fit to the data to estimate the resource productivity, resource use efficiency and optimum resource allocation (Ahuja, 1995). The fitted equation was in the following manner:

$$Y = aX_1^{b1}.X_2^{b2}.X_3^{b3}.X_4^{b4}.X_5^{b5}.X_6^{b6}.X_7^{b7}.X_8^{b8}.X_9^{b9}$$

where,

Y = yield of flower in quintal per garden

a = Intercept, bi = regression coefficient of the respective resources, X_1 = area of the flower garden in hectare, X_2 = labour in manday per garden, X_3 = Bullock labour in pair day per garden, X_4 = nitrogen in kg per garden, X_5 = phosphorus in kg per garden, X_6 = potash in kg per garden, X_7 = manures in quintal per garden, X_8 = pesticide in lit, X_9 = irrigation in m^3.

$$\text{Log}Y = \log a + b_1\log X_1 + b_2\log X_2 + b_3\log X_3 + b_4\log X_4 + b_5\log X_5 + b_6\log X_6 + b_7\log X_7 + b_8\log X_8 + b_9\log X_9$$

Concepts which were frequently used in the present study are cleared as follows. Man day referees to measurement of human labour where as female labour is equal to 0.50 man day in case of both hired and family labour because the prevailing wage rates for hired or family female and hired or family male labour were Rs.30 and Rs.60 per day, respectively. Rent refers to price for use of land of one for the crop period. Resource productivity refers to marginal physical product with

* Author for correspondence

respect to added unit of input. It is denoted by MP = b $^{y}/_{xi}$, in Cobb-Douglas production function. Where, b is elasticity of production, Y is geometric mean rose garden production and Xi is geometric mean of respective input or resource marginal value of product refers to multiplication of MP and Py, whereas MP is marginal product of rose production with respect to specific resource and Py is price of flower per quintal. Resource use efficiency refers to the ratio of marginal value product to acquisition price of that resource. Optimum level of resource refers to the quantity of specific resource which could result in the highest profit from that resource. It is denoted by Xi = b(yPy/pxi), where, xi is optimum resource, b is elasticity of production, y is geometric mean of rose flower production, py is price of rose flower per quintal and pxi is the price of particular input or resource.

RESULTS AND DISCUSSION

Partial regression coefficient with 't' value, geometric mean of input, marginal product, marginal value product to price and optimum resource allocation with respect to each of specific resources were estimated and are presented in Table 1. It is evident from the table that the regression coefficient of nitrogen, manure, and pesticide were 0.018, 0.103 and 0.028, respectively which were found to be positive and highly significant at 1 per cent level of significance. It was inferred that 1 per cent increase in nitrogen, manure and pesticide of its geometric level, it could lead to increase production by 0.018, 0.103, 0.028 per cent, respectively. Similarly, in case of phosphorus, potash and irrigation, elasticity of production were 0.025, 0.008 and 0.108, respectively.

It was implied that there was increase in phosphorus, potash and irrigation by 1 per cent, it would lead to increase production by 0.021, 0.008, 0.108 per cent, respectively. On the contrary, regression coefficients of area of rose garden, human labour, and bullock labour were positive but non significant. Coefficient of multiple determination (R^2) was 0.981, it indicated that 98.10 per cent variation rose flower production was due to selected independent variables. F-value was 147.350 which was highly significant. Return to scale was 0.749 which indicated that production was in second stage of production. These results are confirmative with Raut (2003) regarding to fertilizer and manure.

Regarding marginal productivity or resource productivity, it is also evident from the table that existing area of rose garden was 0.32 hectare. It was inferred that marginal productivity with respect to pesticide was highest of 0.100 quintal followed by manure (0.0332q), phosphorus (0.008q), potash (0.004q), nitrogen (0.003q), irrigation (0.001q) related to significant variables in the production. It was inferred that use of pesticide increased by 1 litre, it would lead to increase production by 0.100 quintal, marginal productivity of area of rose garden was 3.898 quintals followed by bullock labour (0.054 q), human labour (0.007 q).

In relation to resource use efficiency, the ratio of MVP to price with respect to manure was the highest as 3.20 followed by potash (1.88), pesticide (1.81), bullock labour (1.44), phosphorus (1.60), irrigation (1.15), nitrogen (1.06). On the contrary, MVP to price ratio of area of rose garden was 0.75 followed by human labour (0.46).

Table 1 : Partial regression coefficients in reference to resource productivity use efficiency and optimum resource use in rose flower production

Sr. No.	Independent variable	Regression coefficient (bi)	Standard error (SE)	't' value	Geometric mean of input (X_1)	Marginal product (q)	Marginal value product (Rs)	Price of input (Rs.)	MVP to price ratio	Optimum resource use (Xi)
1.	Area of rose garden (ha/ garden)	0.125	0.076	1.164	0.32	3.898	15593.75	20791.16	0.75	0.24
2.	Human labour (manday/ garden)	0.115	0.046	1.825	154.96	0.007	28.00	60.00	0.46	76.51
3.	Bullock labour (pairday/ garden)	0.032	0.022	1.406	5.58	0.054	216.00	150.00	1.44	8.51
4.	Nitrogen (kg/garden)	0.018	0.012	3.498**	61.36	0.003	12.00	11.30	1.06	63.58
5.	Phosphorus (kg/garden)	0.025	0.038	2.077*	29.76	0.008	32.00	20.00	1.60	33.53
6.	Potash (kg/garden)	0.008	0.016	2.163*	19.34	0.004	16.00	8.50	1.88	37.57
7.	Manure (q/garden)	0.103	0.046	2.879**	32.02	0.0332	128.00	40.00	3.20	102.79
8.	Irrigation (m^3/garden)	0.108	0.081	2.161*	1164.68	0.001	4.00	3.45	1.15	1249.68
9.	Pesticide (lit/garden)	0.028	0.091	2.173**	2.77	0.100	400.00	220.00	1.81	5.08

Note : Geometric mean (y) of rose production was 9.98 q and its price was Rs.4000/q.
* and ** indicates significance of values at P=0.05 and 0.01 respectively
Intercept(loga) - -2.517 F value - 147.350 R^2 - 0.981
Return to scale (Σbi) - 0.749

It was implied that one rupee was spent on each variable namely manure, potash, pesticide, bullock labour, phosphorus, irrigation, nitrogen, it would lead to give like Rs.3.20, Rs.1.88, Rs.181, Rs.1.44, Rs.1.40, Rs.1.15, Rs.1.06, respectively. If MVP to price ratio was near to unity that resource use efficiency would be the highest.

Regarding optimum resource use in related to significant variables use of nitrogen could be increased from 61.36 to 63.58 kg as optimum resource use. In next order, phosphorus could be increased upto (33.53 kg), followed by potash (37.57 kg), manure (102.79 q), irrigation (1249.66 m^3), pesticide (5.08 lit). On the contrary, use of area of rose garden and human labour was reduced from 0.32 hectare to 0.24 hectare and 154.96 man days to 76.51 man days.

REFERENCES

Ahuja, H.L. (1995). Cobb-Douglas production function and labour share in national income pp.327-329. In : *Advanced Economic Theory Micro Analysis*. S. Chand Company Ltd. Ramnagar, New Delhi, 1012P.

Raut, K.B. (2003). Economics of production and marketing of flowers in Pune district of Maharashtra. M.Sc. (Agri.) Thesis, Marathwada Agricultural University, Parbhani, 130P.

Received : February, 2009; Accepted : April, 2009