

Productivity Differences of Different Seasons for Cauliflower Crop of District Ranchi

R. B. SINGH¹, D. K. SINGH² and K. V. SINGH³

The productivity of different seasons in cauliflower crop in Ranchi district showed manures and fertilizers in all the three seasons, marketing in Kharif season, irrigation and marketing in Rabi season and bullock labour days in Zaid season to have significant elasticities of production. Manures and fertilizers are the only input factors whose ratio of marginal value productivity to its factor cost was more than one in all the three seasons while that of human labour, plant protection measures and marketing in Rabi season and bullock labour in Zaid season were observed to be more than unity.

Cauliflower, hitherto regarded as an autumn and winter crop has now been increasingly grown in the Ranchi Plateau of Bihar through out the year because of its agro-climatic advantages. Though its importance as a remunerative crop, providing flow of ready income to farmers, the empirical work on productivity of different factors employed in its production is scanty. An attempt is therefore, made to examine the efficiency of different resources used in the production in different seasons viz., Kharif, Rabi and Zaid.

MATERIALS AND METHODS

For the present investigation 45 farmers in the village of Pithoria in Kanke Block (Ranchi district) were selected. Input-output data were recorded on the basis of actual plot size which were then converted into per acre basis. The relevant data were

collected by survey method with the help of specifically prepared questionnaires.

To work out marginal value productivity and resource use efficiency, three Cobb-Douglas production functions were fitted using per acre data, one each for Kharif, Rabi and Zaid season.

$$Y = a \cdot X_1^{b_1} \cdot X_2^{b_2} \cdot X_n^{b_n}$$

Where Y refers to the value of the output, X refers to the specific resources, b denotes the elasticity of production and 'a' denotes constant.

RESULTS AND DISCUSSION

Production Functions: The examination of the Table I showed that nearly 56, 68 and 89 per cent of the variations in the total output of Kharif Rabi and Zaid seasons respectively

TABLE-I Coefficients of production with their standard errors and multiple correlation coefficients

Season	Sample size	Manures/ Fertilizers (X ₁)	Irrigation (X ₂)	Human + labour (X ₃)	Bullock labour days (X ₄)	Plant pro- tection mea- sures (X ₅)	Marketing ++ (X ₆)	R ²	R	F-value
Kharif	45	0.0845** (0.0191)	-0.0052 (0.0067)	-0.0341 (0.0367)	— —	0.0140 (0.0202)	0.0747** (0.0204)	0.5631	0.7504	10.02**
Rabi	38	0.2645** (0.0486)	0.1318* (0.0618)	0.1163 (0.1110)	-0.1387 (0.0743)	0.0760 (0.0463)	0.2233* (0.0930)	0.6797	0.8245	10.97**
Zaid	17	0.2320** (0.0507)	0.0739 (0.0520)	-0.1400 (0.1040)	0.2380** (0.0631)	-0.0427 (0.0511)	—	0.8947	0.9459	18.61**

Figures in parentheses indicate standard errors of corresponding elasticities.

*, ** Denote significant at 5 per cent and 1 per cent level respectively;

+X₃ Indicates human labour plus bullock labour (in rupees) in the Kharif season and only human labour days in Rabi and Zaid seasons.

++X₆ It was found out during the analysis that exclusion of marketing variable in the Zaid season did not affect the coefficient of multiple determination (R²) and hence it was ultimately dropped from the production function fitted for this season.

was explained by the inputs considered for the study. However, the unexplained part might be due to the result of costs which have been left out as sampling errors.

The regression coefficients of manures and fertilizers in all the three seasons, marketing in Kharif seasons and bullock labour days in Zaid season were positive and significant, while the regression coefficient of irrigation and marketing in Rabi season was also positive and significant (Table I). This indicates that a one per cent increase in these inputs in different seasons causes an increase in gross income by

percentage of the value of the respective regression coefficients of respective seasons. However, the regression coefficients of irrigation and human plus bullock labour in Kharif season, bullock labour days in Rabi season and human labour days and plant protection measures in Zaid season are negative and non-significant.

Marginal value product and resource use efficiency: The marginal value products of inputs were computed at their geometric mean levels for the different seasons of cauliflower, to examine the resource use efficiency and the ratio of margi-

TABLE-II Mean marginal productivities along with their ratio to factor cost of different inputs

Variable	Kharif		Rabi		Zaid	
	Unit of measurement	M. V. P. at Geometric mean	Unit of measurement	M. V. P. at Geometric mean	Unit of measurement	M.V.P. at Geometric mean
X ₁ Manures & Fertilizers	(Rs.)	1.65 (1.65)	(Rs.)	2.17 (2.17)	(Rs.)	1.79 (1.79)
X ₂ Irrigation	(Rs.)	-0.51 (-0.51)	(Rs.)	0.93 (0.93)	(Rs.)	0.37 (0.37)
X ₃ Human Labour	(Rs.)	-0.52 (-0.52)	(Number of working day	2.79 (1.39)	(Number of working days	-2.42 (-1.19)
X ₄ Bullock Labour	—	—	(Number of working days)	-30.13 (-10.18)	(Number of working days)	37.93 (12.86)
X ₅ Plant protection 5 measures	(Rs.)	0.63 (0.63)	(Rs.)	2.17 (2.17)	(Rs.)	-0.81 (-0.81)
X ₆ Marketing	(Rs.)	0.76 (0.76)	(Rs.)	1.72 (1.72)	—	—

Figures in parentheses indicate ratio to factor cost.

Acquisition cost of human labour - Rs. 2.01 and Rs. 2.03 per day for Rabi and Zaid seasons respectively.

Acquisition cost of bullock labour - Rs. 2.96 and Rs. 2.95 for Rabi and Zaid seasons respectively.

nal value product to factor cost (Table II).

The ratio of marginal value product to factor cost (i.e., marginal value product per rupee of input) was found more than unity for manures and fertilizers in all the three seasons, that of human labour, plant protection measures and marketing in Rabi season and bullock labour in Zaid season indicating thereby that the use of these inputs should be increased in respective sea-

sons to realise higher returns and profit. However, there are some input factors whose ratio of marginal value product to their factor cost was observed to be either less than unity or negative which indicates that the use of these resources should be curtailed in the respective seasons to realise higher profit and the money incurred on these inputs may be allotted for the use of those inputs whose marginal value product per rupee of input was more than unity.