MATHEMATICAL MODELLING FOR DEMAND AND SUPPLY ESTIMATION

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Abstract

The output supply and factor demand are closely interlinked to each other. Therefore, any change in factor and product prices affects the factor demand and output supply simultaneously. The present study used cross sectional cum time series data of Assured Rainfall Zone (Zone VII) of Vidarbha region for soybean crop for the eleven years from 1997-98 to 2007-08 were collected from the Agricultural Prices and Cost Scheme Department of Agril. Economics and Statistics, Dr. PDKV, Akola by keeping in view to study the change in factor and product prices, cost and returns and to estimate factor demand and output supply by using normalized Cobb- Douglas profit function. The study reviled that, the gross income from soybean increased at an annual rate of 9.826 per cent per annum. It may be attributed to both, the increase in output prices as well as increase in yield. An examination of change in returns from soybean showed that the profitability has increased over the years. The output cost ratio was increased from 0.938 in 1997-98 to 1.559 in 2007-08. Joint estimation of Cobb- Douglas Profit Function and factor demand equation by using Zellner's method shows that fixed factors and variable factors explained 77.8 per cent variation in normalized profit for soybean crop under study. The analysis of factor demand equation showed that the demand elasticities with respect to own prices had the expected negative signs indicating that the results were in accordance with the theory of demand. The effect of wage rate was more on bullock labour demand (-0.390), while the effect of bullock labour price on human labour demand was low (-0.167). This indicates the one way complementarity between bullock labour and human labour. The output supply equation revealed that among the fixed factor, capital was found to be very effective in increasing the supply of soybean. The output supply elasticity with respect to capital was elastic (0.99). Assuming no change in fixed factors or the level of technology, the input-output price structure has not resulted in a appreciable increase in human labour employment as well as fertilizer demand in the production of soybean crop.

The impact of input-output price on demand for farm yard manure (5.9 percent per annum) significantly increased in the production of soybean crop under study. The price observed during the last decade was better to maintain the growth in soybean supply by 4.221 per cent per annum. The growth in supply of soybean is more than the growth in population.