RESEARCH NOTES

DEALER AND BRAND PREFERENCE IN PESTICIDES - A LOGIT ANALYSIS.

Introduction

For a firm, it is vital to know the consumer market as consumer's decisions affect the performance of the organisation. For example, to facilitate the management decisions of pesticides manufacturer, it would be necessary to develop perspectives on customer's characteristics and their buying behaviour. Hence any study regarding marketing of pesticides will be useful to the producers, who are far away from the consuming area, and also to the marketing functionaries to make appropriate and specific market decisions which helps in getting more and more business to the marketing organisations.

Any company involved in the pesticides manufacturing and distribution business is considered as brand and if a farmer purchased a particular brand for more than one year, he is considered to by loyal to the brand. If a farmer purchased a major bulk of his requirement from a paticular dealer for more than one year, he is considered to be loyal to that dealer (Padmaraj. 1983).

Farmers wanted all pack sizes to be made available and majority of them preferred smaller pack size and preferably according to recommended dose per acre. Farmers mostly enquired about competitive prices, brand name and product quality. While purchasing a particular brand. cost is one of the most important factor influencing the purchase (Sharma, 1985).

Among the reasons for brand loyalty, quality of product. habit of use, ready and regular availability of the products strengthen the loyalty of their brands (Singh, 1981).

Brand loyalty and dealer loyalty are an integral part of the buying behaviour. Hence, through this, buying behaviour could be explained. To understand better about the brand loyalty and dealer loyalty, the logit model is employed .

Methodology

The study on pesticides was conducted in an intensive cotton cultivation site viz., Udumalpet subregion of Tamil Nadu. Coimbatore district in which the study site lies, tops cotton production in Tamil Nadu. One-fourth of total cotton is produced in this district. The black cotton soil of this region has, historically, favoured cotton production. The cotton growers were selected purposively, for cotton growers used higher levels of plant protection chemicals than any other crops growers. To achieve the objective, the primary data have been collected from 60 randomly selected farmers. The field survey was conducted during the months of October to December 1990.

The varieties grown in this area are Suvin, LRA 5166, DCH 32 and MCU 5. Most of the experienced farmers sprayed sixteen to eighteen rounds of chemicals as a preventive measure. The availability of plant protection equipments in the farms has got significant bearing on the timely application of pesticides. The cotton growers on an average invested nearly 31 per cent of cost of cultivation on plant protection measures. Among the pesticides groups, cotton growers invested more on organo phosphorus chemicals followed by synthetic pyrethroids. The own price elasticity of pesticides was - 0.79 indicating that the higher price of pesticides reduces the demand for it, was estimated through Multinomial Logit Model.

Three sources, namely, the private dealers, the depot run by Agricultural Department and the co-operative societies were open to the farmers for purchase of pesticides.

In order to study the factors that determine the farmer's preference for a particular dealer or particular brand, the logit model was specified. The Logit Model can be represented as

$$P_i = E_i (Y_i = 1/X_i) = \frac{1}{1+ e^{-(\beta_1 + \beta_2 X_i)}}$$

where

X_i = the scores of the attributes for the i [th] individual.
Y_i = 1 if the ith individual is loyal
     0 if the ith individual is not loyal
e = the familiar base of natural logarithm.

For ease of exposition, we write as

$$P_i = \frac{1}{1+e^{-Z_i}}$$

where

$$Z_i = \beta_1 + \beta_2 X_i$$

If P_i, is the probability of loyalty, then $(1-P_i)$ the probability of non loyalty is

$$1-P_i = \frac{1}{1+e^{Z_i}}$$

Then we can write

$$\frac{P_i}{1-P_i} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i}$$

$P_i / 1-P_i$ = odds ratio of probability for loyalty and the probability for non loyalty

Now, if we take the natural logarithm.

$$L = \ln \left| \frac{P_i}{1-P_i} \right| = Z_i = \beta_1 + \beta_2 X_i.$$

L = Log odds ratio (Gujarathi, 1988)

The favourableness of loyalty is expressed in scores. The most facourableness scored 4 and least favourableness 1.

For dealer loyalty the model is given by

$$Y = \beta_1 X_1 + \beta_2 X_2 \ldots\ldots\ldots\ldots\beta_{10} X_{10} \text{ ------(1)}$$

Where

$Y = 1$, if the farmer was loyal to the particular dealer
   $= 0$, if not dealer loyal
X_1 = availability of preferred brands
X_2 = dealer's advertisement
X_3 = technical guidance by the dealer
X_4 = price of the product
X_5 = credit availability
X_6 = quality of the product
X_7 = discount and subsidy
X_8 = distance between farm and dealer shop
X_9 = malpractices
X_{10} = peer group influence

β_1 to β_{10} = parameters to be estimated.

To study the brand loyalty, the model is given by

$$Y = \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots \beta_7 X_7 \text{ ------(2)}$$

Where

Y = 1, if the farmer is loyal to a brand

 = O, if no brand loyalty.

X_1 = price of the preferred brands

X_2 = package of the preferred brand

X_3 = quality of the preferred brand

X_4 = efficiency of the preferred brand

X_5 = influence of advertisement

X_6 = peer group influence

X_7 = availability of the preferred brand.

β_1 to β_{10} = parameters to be estimated.

Results and Discussion

The results are presented in Table I which reveals the farmers were loyal to dealers than to the brands. The percentage of farmers who were loyal to dealer alone was maximum being 66.67 per cent.

Table 1. Brand loyalty and dealer loyalty among farmers

Particulars	Number of farmers	percent to total
Brand loyal only	3	5.00
Dealer loyal only	40	66.67
Both brand and dealer loyal	9	15.00
Neither brand nor dealer loyal	8	13.33
Total	60	100.00

The Logit Model was estimated using the maximum - liklihood estimation. The interpretation of the Logit Model is as follows: β the slope, measures the change in L for a unit change in X. The change in probability for a unit increase in X value is $\beta (1-\hat{P}) \hat{P}$, where $\hat{P}$ is the estimated probability at mean level (Gujarathi, 1988). The favourableness of loyalty is expressed in scores. The most favourableness scored 4 and least favourableness 1.

The results of the factors contributing to dealer loyalty analysis are presented in Table II. Among the determinants of dealer loyalty, the credit availability and distance were highly significant and positive. At $\hat{P}$ 0.85 evaluated at mean level, when the favourablenesss of credit availability and

Table. II Factors contributing to dealer loyalty

Variables	Coeffi-cient	't' value	Mean value	Change in probability
Availability of preferred brand	0.0819	2.417	2.3000	0.010**
Dealers advertisement	0.0620	1.416	3.1833	0.008
Technical guidance	0.0352	1.173	2.3833	0.004
Price of the product	0.0448	1.613	2.7833	0.006
Credit availability	0.1072	3.224	3.1667	0.014*
Quality of the brand	0.0360	1.098	2.9167	0.005
Discount and subsidy	0.0351	1.067	2.7848	0.004
Distance	0.0848	2.944	3.3670	0.011*
Malpractices	0.0337	0.935	3.1000	0.004
Peer group influence	0.0625	1.646	3.1500	0.008
Percentage of correct predicition = 90				

* Significant at one percent level of probability.
** Significant at five percent level of probability.

distance by increase one score, their effect on proabability of dealer loyalty are 0.014 and 0.011 respectively. Availability of preferred brand had significant contribution in change in probability of dealer loyalty at 5 per cent level. All other variables were not significant but they had positive sign of influence.

The results of the brand loyalty analysis are presented in Table III which indicate that the price and efficiency were highly significant and positive. At P 0.77 evaluated at mean level, when the favourableness of price and efficiency increases by one score their effect on the probability of brand loyalty are 0.475 and 0.387 respectively. All other variables were not significant and mojority of them had negative signs except the availability of preferred brand.

Conclusions and Suggestions

Among the determinants of dealer loyalty, the credit availability and distance were highly significant and positive. Therefore the dealers provide credit facilites to buyers to increase the sales volume and the credit sales should be entertained with normal interest rate and the distance between the

Table. III Factors contributing to dealer loyalty

Variables	Coeffi-cient	't' value	Mean value	Change in probability
Price	1.2656	3.848	2.6833	0.475*
Packing	-1.0769	-1.050	1.3833	0.245
Quality	-0.6448	-0.947	2.1200	0.375
Efficiency	1.7770	2.733	2.1833	0.387*
Advertisement	-1.1773	-1.081	1.4000	0.248
Peer group influence	-0.9879	-1.224	1.9333	0.342
Availability of preferred brand	0.1728	0.195	2.0167	0.357
Percentage of correct predicition = 80				

* Significant at one percent level of probability.

farmers and dealer should be minimum.

The impact of technical guidance of dealers on the changes in probability of dealer loyalty was not significant but positive because the personnel in private trading do not have adequate technical knowledge. So suitable training programmes must be arranged to them by the Agricultural Department and Agricultural University to promote technical guidance given to the farmers by the private dealers.

The famers who were loyal to brand were very few. This was due to lack of knowledge on the different brands of pesticides. Extension services should show more attention in spreading the knowledge on various brands of pesticides.

Among the various factors, the price and efficiency of a brand had significant and positive impact in sustaining the brand loyalty of the farmers. Since pesticides business is very competitive, the new growing firms should focus their attention on quality and efficiency aspects besides keeping their product price as low as possible. Therefore manufacturing firms on their part too must be rigid in maintaining the quality and efficiency of their products by scrutinising and removing the ill-filled containers and preventing adulteration if they are found in any retail outlet.

It is inferred from the survey that the farmers in general prefer to puchase

all their requirements from limited number of sources. Hence besides offering of wide variety of chemicals, different company chemicals, supply of other inputs such as seeds, fertilizers at a single point would help the farmers to a great extent.

In the present study, it was understood that the farmers as well as dealers are of the opinion that the price of pesticides are too high. Goverment as well as the formulators should try to reduce the manufacturing cost of pesticides and farmers must be trained in efficient use of pesticides in cotton.

References:

1. Gujarathi, Damodar N. (1988), "Basic Econometrics" New York: McGraw Hill Book Company, pp.481-89.

2. Padmaraj, D. (1983), "An Economic Analysis of Fertilizer Use and Fertilizer Buying Behaviour in Paddy Farms of Andhara Pradesh" Unpublished MSc (Ag) Thesis, Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, p. 17

3. Sharma, D.D. (1985), "Weedicide Purchase Behaviour of Farmers of Punjab," *Pesticides*, 19 (4): pp 33-37

4. Singh,J.D. and Raghbir Singh, (1981) "A Study of Brand Loyalty in India, *Indian Journal of Marketing*, 11 (11&12) : pp 15-21

SRI SANKARI[1], AND C. RAMASAMY[2]

1. Senior Research Fellow, Water Technology Centre, Tamil Nadu Agricultural University, Coimbatore.
2. Professor and Head, Department of Agricultural Economics, AC & RI, Madurai.