The annual rainfall with NEM has significantly positive correlation of 76 per cent at both the locations.

Significant and positive correlation existed between the same seasons of NA and EB. The NEM rainfall of NA was significantly and positively correlated (81.8%) with annual rainfall of EB.

*Regression Equation*

The daily, monthly, seasonal and annual rainfall of NA were regressed over respective rainfall series of EB and the regression equations are presented in Table 4. The $R^2$ values were significant for all the months except the daily series and December month rainfall.

From the results presented, it is concluded that higher average annual rainfall was recorded at the NA than EB in all the seven years and the mean difference between the locations was 32 mm.. The highest seasonwise rainfall was received in NA than EB in all the cases except summer rainfall of '94, SWM of 92 and NEM of 97 and 98. The year 1994 received the rainfall in all the months at both locations with greater number of rain days. Highest amount of rainfall was received in the year '98 with less number of rain-days at both the locations. Peak rainfall was received during the month of November in both the locations. The variation of rainfall amount was less in NEM season between the locations. The NEM rainfall of NA had significant and positive correlation with annual rainfall of EB.

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# Farmers brand and dealer loyality to pesticides in Coimbatore district

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**Abstract :** This study was carried out in Coimbatore district with 120 sample farmers to analyse the factors responsible for brand and dealer loyalty towards pesticides. The results showed that price of the preferred brand $(x_1)$ and efficiency of the preferred brand $(x_2)$ were significant at one per cent level for brand loyalty. The factor advertisement also influenced the brand loyalty at five per cent level. With regard to dealer loyalty, factors such as credit availability $(x_1)$ and quality of product $(x_2)$ were significant at one per cent level. The study showed that farmers are loyal to pesticide brands and also to pesticide dealers. (*Key Words : Brand, dealer, loyalty, regression*)

The use of pesticides as a mean to prevent loses by pests and diseases in agriculture commenced in India around 1948-49. Originally, pesticides such as DDT and BHC were imported in the formulated form into our country for mosquito control. Slowly, farmers started using these pesticides for agricultural purposes as well. The first unit for the manufacture of technical BHC and its formulation was established in the country in 1952, followed by another unit in 1955 for the manufacture of DDT (Jalan, 1987).

The annual demand of these pesticides at present is as high as 1,25,000 tonnes (including 41,000 tonnes used in public health programmes) and predicted that the demand may be around 2,00,000 tonnes by the turn of this century. At present, around 71,000 tonnes of pesticides are being manufactured in India and rest of them are being imported. The average consumption of pesticides in India is one of the lowest in the World with 327 gms/ha compared to 10 kgs/ha in Japan (Narasimhamurthy, 1993).

Indian market constitute only 1.9 per cent of the total world market of pesticides while the United States of America is leading with 33 per cent (Mann, 1990).

The consumption pattern of major agrochemical groups used in India showed that the insecticides rank first (75 per cent) followed by herbicides (13 per cent), fungicides (8 per cent) and others (4 per cent) (Prasad Chandran, 1989). Although number of studies on pesticide use pattern, farmers adoption behaviour regarding plant protection measures are available, however, the changing situations and other circumstances warrant more and more studies in this regard.

Coimbatore District is an important agriculturally well developed District in Tamil Nadu. Farmers in this district are practising modern agricultural technologies for various crops. In this paper, an attempt was made to study the farmers attitude towards dealers, i.e., their loyalty towards dealers in respect of purchase of pesticides. Besides, an attempt was also made to analyse the farmers preference for a particular brand loyalty and the factors influencing the preference for a particular brand loyalty.

## Materials and Methods

Coimbatore District was purposively selected for this study, considering the high level of pesticide use compared to other districts of Tamil Nadu. In this district, three blocks viz., Anaimalai, Udumalpet and Pollachi (south) were randomly selected. From each of these blocks, four villages were selected at random and from each village 10 farmers were selected randomly. Thus, 120 sample farmers of the study area formed the sample size. The study was conducted during 1993.

The quantity of pesticides used by the sample farmers in three blocks were subjected to 'Analysis of Variance'. The results showed significance among the blocks, hence, the analysis were carried out blockwise. The sources of information for selection of brands and response for price changes in preferred brand by farmers were analysed. A linear multiple regression model of the following form was specified to estimate the factors influencing the brand loyalty among the farmers.

$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + u.$

Where,

| y | - | Brand loyalty |
|---|---|---|
| a | - | Intercept |
| $b_1$ to $b_6$ | - | Regression coefficients |
| $x_1$ | - | Price of the preferred brand of pesticide in |

Rs.per 10 ml.

| $x_2$ | - | Efficiency of the brand |
|---|---|---|
| $x_3$ | - | Influence by advertisements |
| $x_4$ | - | Package of the brand |
| $x_5$ | - | Peer group influence |
| $x_6$ | - | Availability of preferred brand; and |
| u | - | Error term |

The variables $x_2$ to $x_6$ were measured using four point continuous scale based on satisfactory level. i.e.,

| 4 | - | Higher satisfaction |
|---|---|---|
| 3 | - | Satisfactory |
| 2 | - | Moderately satisfactory |
| 1 | - | Not at all satisfactory |

*Price of the preferred brand :* The prices of similar group of pesticides from various firms varied and this variation influences the choice of the brand preferred by the farmer. A farmer tend to use the same brand repeatedly only if he was satisfied with the price and quality of that brand. Hence, the actual price of the pesticide in rupees per 10 millilitres prevailing at the retail outlet was included.

*Efficiency of the brand :* The opinion of the farmers regarding the control of pests by a particular brand of pesticide was considered as it was bound to influence his loyalty towards it. If the farmer found that a particular pesticide is efficient or more effective in controlling the pest, then he considers that pesticide as an efficient one. Hence, the efficiency of the brand was included as a variable in this model.

*Influence by advitisements :* The advertisements about brands of pesticides by various firms and dealers would influence the farmers to a great deal in choosing a particular brand, hence this had been included as a variable in this model.

*Package of the brand :* The good package and different sizes of package also influence the farmer's brand choice. Small and marginal farmers require small packages since they cultivate smaller areas and may not prefer purchase of a larger package. Hence the package size was included as a variable in this model.

*Peer group influence :* The friends, neighbours, relatives, extension workers and others were presumed to have influenced significantly the brand choice of the farmers and hence the influence of the peer group was included as a variable in this model.

*Availability of the preferred brand :* The availability of the preferred brand of pesticide at all times in

the retail outlet in the same area would also influence the farmer's loyalty towards the brand. The easy availability of a brand of pesticide will make the farmer as loyal towards it.

*Dealer Loyalty :* A linear multiple regression model of the following form was specified to estimate the factors influencing the dealer loyalty among the farmers.

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + u.$$

Where,

| | | |
|---|---|---|
| y | - | Dealer loyalty |
| a | - | Intercept |
| $b_1$ to $b_8$ | - | Regression coefficients |
| $x_1$ | - | Credit availability |
| $x_2$ | - | Quality of the product |
| $x_3$ | - | Availability of preferred brand |
| $x_4$ | - | Price of the product |
| $x_5$ | - | Customer service |
| $x_6$ | - | Malpractices |
| $x_7$ | - | Peer group influence |
| $x_8$ | - | Dealer's advertisements |
| u | - | Error term |

If a farmer purchased the pesticides from a particular dealer for more than one year, then he was considered as dealer loyal. A score of one was given to a farmer who had purchased from a dealer for one year, if he had purchased for two years, a score of two was given and so on.

The independent variables $x_2$ and $x_8$ were measured using a four point continuous scale. The scores four, three, two and one were assigned to quantify highly satisfactory, satisfactory, moderately satisfactory and not at all satisfactory.

*Credit availability :* Availability of credit facilities at the retail outlets was found to influence the dealer loyalty positively among the farmers. i.e., farmers would be more loyal to a dealer who extends credit facilities throughout the year. The amount and terms of credit offered were important to the farmers. The variable $x_1$ was represented as a dummy variable, specified as one if credit was available from that dealer and zero if credit was not available from that dealer.

*Quality of the product :* This refers to the availability of quality pesticides with a dealer. When the farmers feel that high quality and efficient pesticides were sold by the dealer, then, they tend to remain loyal to that particular dealer.

*Availability of the preferred brand :* Availability of

preferred brand, timeliness, and adequacy of pesticides with a dealer made a farmer more loyal to the dealer.

*Price of the product :* The prices stated by different companies in pesticide retailing varied and the farmer in his effort to economise the expenditure on pesticides would become more loyal to a dealer who offers pesticide at a comparatively lower price.

*Technical guidance / customer service :* It includes the treatment given by the dealer to the customer. Technical guidance in the form of solving the problems regarding pest control induces a farmer to remain loyal to the dealer. The farmer tend to be more loyal to a dealer who maintains a cordial and friendly relationship with his customers.

*Malpractices :* Adulteration, sale of expired pesticides, illfilled containers, duplicate products, higher price were some of the common malpractices adopted by traders. Farmers were disloyal to the dealers adopting the above malpractices whenever they happen to know it.

*Peer group influence :* The friends, neighbours, relatives, extension officers and others were presumed to have influenced substantially the preference of a particular dealer by the farmers and hence were more loyal to those dealers.

*Advertisements :* Dealers, similar to pesticide firms advertise among the farmers for those products available at their sale point or retail outlet. This advertisements create an awareness among the farmers about the various products the dealer has got to offer, thereby making a farmer to go to a dealer for his purchases.

### Results and Discussion

*Brand Loyalty*

The results of the linear multiple regression analysis for estimating the factors influencing brand loyalty are presented in Table 1. The co-efficient of multiple determination was 0.51 which means that the explanatory variables included in this model explained 51 per cent of variation in the brand loyalty of the farmers. The price of the preferred brand $(x_1)$ and efficiency of the preferred brand $(x_2)$ significantly influenced the brand loyalty of the farmers at one per cent level. Influence of advertisement $(x_3)$ was significant at five per cent level. Only when the price of a particular brand is comparatively lower to prices of other brands in the market, farmers would naturally prefer the low priced brand, otherwise farmers would continue to purchase the same brand because the efficiency of the brand tested by them was at satisfactory level.

Inferences were drawn based on sign and significance while the values of the parameters were not interpreted since the variables are of qualitative aspects. The results of this study are in confirmity with the findings of Sivakumar (1987) and Srisankari (1991).

*Dealer loyalty*

The results of the linear multiple regression analysis for estimating the factors influencing dealer loyalty are presented in Table 2. The co-efficient of multiple determination was 0.62, indicated that the explanatory variables included in the model explained 62 per cent of the variation. Credit availability $(x_1)$ and quality of the product $(x_2)$ significantly influenced the dealer loyalty of the farmers at one per cent level. Availability of preferred brand $(x_3)$ and price of the product $(x_4)$ also influenced the dealer loyalty significantly at five per cent level. If credit facilities were given by the dealer and the quality of the products sold by him were good naturally the farmers would tend to be loyal to that dealer. The variable malpractices in sale of pesticides prevailing at the dealers point also significantly influenced the farmers loyalty towards the dealer but with negative co-efficient i.e., the farmers became disloyal, when they came to know that the dealers were adopting some kind of malpractices in the pesticides sale. Customer service $(x_3)$ was not significant indicating the need to provide better customer service as expected by the farmers. Similarly peer group influence $(x_7)$ and dealers advertisement $(x_8)$ were not significant in affecting the farmers loyalty to the dealer. The results of this study are in confirmity with the earlier findings of Sankari (1991) and Sivakumar (1987).

## Conclusion

The study brought to light that the use of pesticides in different blocks varied significantly among the farmers. Extension workers and private dealers play crucial role as they are the major source of information to farmers in selection of pesticides brands. Udumalpet and Pollachi (South) block farmers were more sensitive to increase in price of the preferred brand than farmers in Anaimalai block. The multiple regression analysis revealed that the price of the preferred brand $(x_1)$ and efficiency of the brand $(x_2)$ were significant at one per cent level in influencing the brand loyalty of the farmers in the study area.

In order to rationalise the pesticide use by the farmers, it is necessary to educate the farmers regarding their knowledge on plant protection. The price of the pesticides is an important factor and also the efficiency, both are having a significant role in influencing the brand loyalty of the farmers. As such appropriate price policy is needed from government as well as from pesticide firms. Technical information support provided by the extension functionaries needs to be strengthened and continued.

Farmers relied more upon the private dealers since they are the primary source of information on various aspects of plant protection. More over the credit facilities made available to the farmers at the dealers point of sale has attracted them and made loyal to such dealers. Dealers are playing a crucial role in recommending and supply of various plant protection chemicals, all the dealers should be given training on plant protection measures at periodic

Table 1. Estimates on brand loyalty.

| Variables | Estimated Coefficient | Standard error | 't' Value | Significance |
|---|---|---|---|---|
| Intercept | -1.138 | 0.810 | -1.405 | |
| Price of preferred brand $(X_1)$ | 0.005 | 0.001 | 3.964 | ** |
| Efficiancy of preferred brand $(X_2)$ | 0.405 | 0.123 | 3.289 | ** |
| Influence of advertisments $(X_3)$ | 0.374 | 0.161 | 2.320 | * |
| Package of brand $(X_4)$ | -0.223 | 0.139 | -1.602 | NS |
| Peer group influence $(X_5)$ | 0.252 | 0.137 | 1.842 | NS |
| Availablity of preferred brand $(X_6)$ | 0.165 | 0.114 | 1.446 | NS |

$R^2 = 0.51$                          $F = 7.70$
**      =    Significant at one percent level of probability
*       =    Significant at five percent level of probability
NS      =    Not Significant

Table 2. Estimates on dealer loyalty.

| Variables | Estimated Coefficient | Standard error | 't' Value | Significance |
|---|---|---|---|---|
| Intercept | -0.504 | 0.781 | -0.646 | |
| Credit availablity $(X_1)$ | 0.005 | 0.001 | 4.742 | ** |
| Quality of the product $(X_2)$ | 0.359 | 0.110 | 3.259 | ** |
| Availablity of prefered brand $(X_3)$ | 0.295 | 0.147 | 1.996 | * |
| Price of the product $(X_4)$ | 0.327 | 0.129 | 2.528 | ** |
| Customer service $(X_5)$ | 0.087 | 0.137 | 0.631 | NS |
| Malpractices $(X_6)$ | -0.315 | 0.096 | -3.265 | ** |
| Peer group influence $(X7)$ | 0.070 | 0.106 | 0.662 | NS |
| Dealer's advertisments $(X8)$ | 0.128 | 0.133 | 0.964 | NS |

$R^2 = 0.62$      $N = 80$      $F = 8.55$

**   =   Significant at one percent level of probability
*   =   Significant at five percent level of probability
NS   =   Not Significant

interval for enhancing their knowledge. In sum, the farmers are loyal to the dealers who provided credit along with quality products.

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