USE PATTERN OF FUNGICIDES AND MARKET POTENTIAL FOR CHLOROTHALONIL

Thesis submitted in part fulfilment of the requrirements for the degree of Master of Business Management to the Tamil Nadu Agricultural University, Coimbatore.

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CERTIFICATE

This is to certify that the thesis entitled "USE PATTERN OF FUNGICIDES AND MARKET POTENTIAL FOR CHLOROTHALONIL" submitted in part fulfilment of the requirements for the degree of MASTER OF BUSINESS MANAGEMENT to the Tamil Nadu Agricultural University, Coimbatore is a record of bona fide research work carried out by Mr. P. SIVAKUMAR under my supervision and guidance and that no part of this thesis has been submitted for the award of any other degree, diploma, fellowship or other similar titles or prizes and that the work has not been published in part or full in any scientific or popular journal or magazine.

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Sl. No.	CONTENTS	PAGE NUMBER
1.	INTRODUCTION	1
2.	CONCEPTS AND REVIEW	13
3.	DESIGN OF THE STUDY	31
4.	DESCRIPTION OF THE STUDY AREA	38
5.	RESULTS AND DISCUSSIONS	56
6.	SUMMARY AND CONCLUSION	122
	BIBLIOGRAPHY	129

LIST OF TABLES

TABLE NO	TITLE	PAGE NO
I.	Percentage Losses Due to Causative Agents In India	3
II.	Consumption of Technical Grade Pesticides in India	5
III.	Consumption Pattern of Pesticides in 1990	7
IV.	Rainfall Pattern of Coimbatore District	41
V.	Talukwise Land Use Pattern of Coimbatore District	42
VI.	Source of Irrigation in Coimbatore District	43
VII.	Major Crops Cultivated in Coimbatore District	46
VIII.	Rainfall Pattern of Nilgiris District	50
IX.	Talukwise Land Use Pattern of Nilgiris District	52
X.	Source of Irrigation in Nilgiris District	53
XI.	Major Crops Cultivated in Nilgiris District	54
XII.	Size of Operational Holdings of The Selected Farmers	58
XIII.	Farming Experience of the Selected Farmers	59
XIV	Age Group of The Selected Farmers	61
XV	Educational Level of The Selected Farmers	62

XVI	Cropping Pattern of The Sample Farms - Coimbatore District	64
XVII	Cropping Pattern of The Sample Farms - Nilgiris District	65
XVIII	Cropwise Distribution of Sample Farmers	67
XIX	Cropwise Fungicides Use Pattern of User Farmers	71
XX	Quantity of Fungicides Used by The Sample Farmers	81
XXI	Decision Making By User-Farmers to Use Fungicides	86
XXII	Preference For a particular Brand	89
XXIII	Determinants of Quantity of Fungicides	91
XXIV	Users and Non-Users of kavach	93
XXV	Perception About the Packing	98
XXVI	Perception About the Control Of Disease	99
XXVII	Perception About the price	101
XXVIII	Perception About the Availability in the Market	102
XXIX	Perception About Easy For Application	104
XXX	Perception About Safety	105
XXXI	Perception About the Side Effect	106
XXXII	Perception About the Compatibility with Pesticides	107
XXXIII	Total Market Potential For Cholorothalonil	110

XXXIV Qualified Market Potential For Cholorothalonil 111

XXXV Promotional Strategies of the Competitors-Ranked by the Dealers 120

INTRODUCTION

CHAPTER I

INTRODUCTION

Agriculture is the backbone as well as the dominant sector of the Indian economy and source of livelihood for more than 60 percent of the population of our country[1]. A sharp growth in agricultural production in India, in the last three decades had taken place due to the increasing use of pesticides, fertilizers and seeds of high yielding varieties besides increased irrigation facilities. It is really a matter of pride that Indian Agriculture has today achieved a respectable place in the world. It is able to feed the growing population besides creating a buffer stock of more than 30 million tonnes of food grains through a record production of 184 million tonnes during 1993 - 94[2].

India's population was only 361 million in 1951, which increased to 845 million in 1991 an increase by 484

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[1] Ruddar Datt and K.P.M. Sundaram , Indian Economy, (New Delhi: S. Chand and Company Pvt. Ltd., 1990), pp : 398 - 399.

[2] S.K. Ramana Rao, "Indian Agriculture - Perspectives and Problems", Yojana, January, 12(3) : pp. 13-14, 1994.

million in 40 years. It is estimated that India's population is likely to be 1000 million by 2000 A.D. This increasing population will exercise more pressure on the limited net cultivated area of 142 million hectares to produce the needed quantity of 240 million tonnes of food grains[3]. This necessitates to ensure timely and increased availability of critical inputs like fertilizers, pesticides, machinary, hybrid seeds and improved package of practices to the farmers. The pesticide input, infact, plays a vital role in insuring the efficiency of all the associated inputs, time, efforts spent on the cultivation and also protect from pests, diseases and weeds.

THE INDIAN SCENARIO

Agriculture has to cope up with the numerous insects, diseases, weeds etc. Due to the diverse agroclimatic conditions these problems are more acute. The major crops are known for severe pest and disease infestation. The estimates of losses due to several agencies challenges Indian Agriculture, the details of which are shown in Table-I.

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[3] K. R. Kapoor, "Fertilizers and Agriculture", Fertilzer News, 35 (8) : p 11, 1990.

TABLE-I

LOSSES DUE TO VARIOUS CAUSATIVE AGENTS IN INDIA[4]

Causative Agents	Percentage Loss
Weeds	33
Diseases	26
Insects and rodents	26
Birds and Nematodes	15

The Working Group on Pesticides Industry for the Seventh Plan estimated that about 8-10 million tonnes of foodgrains are lost due to pests and diseases every year[5]. Another report says that in India the annual crop losses are estimated at Rs.6000 to 7000 crores[6]. In this regard pesticides play a vital role since they are proved to be the most effective agents against pests and hence they have

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[4] S. Nagarajan, "Integrated Approach Vital", The Hindu Survey Of Indian Agriculture, 1990, pp: 155-161.

[5] V. K. Srivastava and Patel N. T. "An overview of pesticides in India", Pesticides Information, 12(3) : pp. 19-28, 1988.

[6] S. Nagarajan, Op. Cit., 1993, pp 16-17.

received the greatest attention as one of the major inputs in farming operations.

The growth rate of Indian Pesticide Industry is one of the highest in the world. India has 170 million hectares of arable lands, including 80 million hectares of irrigated land. But only about 63 million hectares are treated with agrochemicals. However pesticides use is forecasted to reach 1,18,000 tonnes of technical grade by the year 2000 A.D. of which agriculture will account for 97000 tonnes. The present market share of India is 3 percent of the world pesticide use[7].

CONSUMPTION AND DEMAND

India is the largest consumer of pesticides in the world. The average / ha consumption of pesticides has gone up from 3.2 gm in 1954-55 to 15.4 gm in 1960-61, to 640 gm in 1980. The trend of consumption of major groups of pesticides in India during 1960 - 1993 is given in Table-II.

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[7] B.V. David, "Indian Pesticides Industry -An overview", The Pesticides Industry, 8 (7) : pp. 16-17, 1993.

TABLE-II

CONSUMPTION OF TECHNICAL GRADE PESTICIDES IN INDIA

(In tonnes)

Year	Insecti -cides	Fungi -cides	Herbici -des	Rodenti -cides	Others	Total
1960	6729	598	-	104	-	7341
1965	10428	1480	-	268	-	12176
1969	17393	986	12	145	-	18536
1970	21741	1774	15	80	-	23160
1971	22013	2067	30	195	-	24305
1974	38970	10337	810	150	165	50432
1975	46515	9600	715	250	150	57230
1976	46605	9183	890	200	275	57153
1977	41250	8553	975	290	850	51918
1978	46755	9685	1425	270	845	58980
1986	-	-	-	-	-	67218
1987	-	-	-	-	-	67270
1988	-	-	-	-	-	66895
1989	-	-	-	-	-	75418
1992	-	-	-	-	-	78000
1993	-	-	-	-	-	80000

Source : B.V David, Op. Cit., pp. 19-20.

Inspite of the significant increase in pesticides consumption, India, with almost 4% of the world cropped area, has a share of around 3.75% of world pesticide consumption. A wide difference exists in the per hectare use of pesticides between the developed and developing countries. In India, the usage is 500 gm / ha while in Japan it is as high as 12000 gm / ha. The use of pesticides falls drastically in a drought year and increases significantly in a year of good monsoons. Also there are marked variations in the use of pesticides across districts. Less than 100 districts in the country account for most of the pesticide consumption. If these districts are subject to drought, the fall in pesticide consumption would be sharp[8].

Differences in the pattern of usage of various types of pesticides in agriculture in India compared to world are summarised in Table-III.

Fungicides constitutes the main, in many cases the only useful and economically acceptable means for effective and reliable control of plant diseases caused by fungal pathogens. Early fungicides for commercial use in India were mostly based on copper. Later Bordeaux mixture and Burgandy

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[8] H.V. Krishna Rao, "Pesticides use pattern in India", Pestology, 14(2): p. 26, 1991.

TABLE-III

CONSUMPTION PATTERN OF PESTICIDES IN 1990 (In Percent)

Pesticides	World	India
Insecticide	44.0	78.0
Herbicide	30.0	10.0
Fungicide	21.0	10.5
others	5.0	1.5

Source : Fertilizers Statistical Report, 1991.

mixture became prominent. In recent years certain antibiotics, organic compounds and systemic fungicides found use in the control of specific diseases of crops. Currently sterol inhibiting fungicides of curative action are making their mark in the history of fungicide usage in crop protection.

CONSUMPTION OF FUNGICIDES

The consumption of fungicides during 1977-78 has accounted for 16.4 percentage of total pesticides consumed and the anticipated consumption of fungicides for the period of 1989 - 90 to 1994 - 95 is projected as 27 percent[9].

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[9] V.R. Prabavastav, "Use patten of Fungicides in Southern India", Pestology, 12(3) : p. 32, 1991.

Out of total pesticides consumption, worth Rs.5577 million, for 1986 fungicide consumption was Rs.690 million, which can be further broken down as below.

	Rs. in Million	Percentage
Crop fungicides	639.28	92.7
Seed dressing	50.72	7.3
Total	690.00	100.00

Among the crops paddy, vegetables, groundnut, potato, apple, tea and coffee consumed 59.4 percent of crop fungicides used. Seeddressings have found use mainly in potato and wheat and some extent in groundnut and sugarcane. In the overall consumption pattern, copper based fungicides dominate the fungicide market in India.

PROBLEMS SETTING

An analysis about the fungicide marketing is important, to develop an appropriate fungicide, for launching, which calls for identifying the farmers' need for fungicides in the selected market, attributes of the existing fungicides, use pattern of fungicides, competition in the market etc. By these the fungicide manufacturing firm can develop a product or modify the existing product which will be able to satisfy the

farmers, which may enhance to position or reposition the products rightly.

Although a number of studies on fungicide use pattern of farmers, farmers' adoption behaviour, farmers' perception etc., had been done the changing situations and other circumstances warrant more and more studies in this regard.

In this context, it was felt that a detailed study of the fungicides market scenario in Tamilnadu is important for analysing fungicide use pattern and assessing market potential for chlorothalonil, a broad spectrum contact fungicide and a new entrant in the product line in Tamilnadu. With this broad objectives the present study was takenup and the specific objectives are as follows.

OBJECTIVES:

i. to examine the fungicide use pattern of farmers in major crops;

ii. to analyse the farmers' perception about the existing fungicides;

iii. to assess the market potential for cholorothalonil; and

iv. to analyse the promotional strategies of the fungicide marketing firms in the selected study area.

SCOPE OF THE STUDY

This study would enable to arrive at a clear picture on the use pattern and perception regarding fungicides by the farmers who are the ultimate end users. It would help the firms to take up remedial measures to remove the obstacles if any, so as to boost up the sale of fungicides. Also the firms can formulate strategies for effective marketing of their products based on the results of the present study. Thus, the present study would assist the firms in making right decisions in relation to their marketing activities and to formulate effective marketing plans to improve their sale volume of fungicides.

LIMITATIONS OF THE STUDY:

The study is based on the primary data collected from the sample farmers and traders. As none of the farmers maintained proper farm records for farming operations, they had to furnish the information from their memory. Traders were

afraid to furnish all the information for the well known reason of trade secrecy. However, every effort had been taken to minimise the bias by including questions that facilitated cross checkings. Hence, the finding of the study may be considered appropriate for the situation prevailing in the study area and extra care should be taken while making generalisation.

ORGANISATION OF THE REPORT

The write up of the study is organised in the following manner.

Chapter I: Introduction. Problem setting, objectives, scope and limitations of the study are presented.

Chapter II: Concepts and Review. Concepts used in the present study and a brief review of earlier research works are discussed.

Chapter III: Design of the Study. Research methodology and tools of analysis are presented.

Chapter IV: Description of the Study Area. General and agricul -tural background of the study area are presented.

Chapter V: Results and Discussion. Major findings of the study are presented, analysed, interpreted and discussed.

Chapter VI: Summary and Conclusion. Summary of results, conclusion drawn and a set of policy description are presented.

CONCEPTS AND REVIEW

CHAPTER-II

CONCEPTS AND REVIEW

The various concepts and earlier studies relevant to the present study are discussed in this chapter. This will help to get a clear understanding of the problem taken and will facilitate meaningful interpretations of the results.

CONCEPTS

MARKET

A few of the researchers had defined market by giving more importance to buyers and many other researchers defined market which consists of both buyers and sellers.

In the first group, Arvind defined market as a set of all actual and potential buyers of a product[1] and Stanton followed it and defined market as a concentration of people with needs to be satisfied, money to be spend and willingness to spend on it[2].

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1. I. Korba Arvind, "Marketing concepts and small scale sector", Indian Journal of Marketing, 13(4) : p. 19, 1982.

2. William J. Stanton, "Fundamentals of Marketing", (New Delhi : McGraw Hill Book Company, 1984).p. 13.

Similarly Kotler viewed market as the set of all potential customers sharing a particular need or want, who might be willing and able to engage so as to satisfy their need or want[3].

Russel and Ronald also defined market in the same way. They considered market as a group of people who could (i) be identified by some common characteristics, interest or problem, (ii) use certain product to advantage; (iii) afford to buy it; and (iv) be reached through some medium[4].

On the other hand Hill defined market as some sphere or space where the forces of demand and supply were at work, the prices were determined or modified, the ownership of some quantity of goods and services were transferred and certain physical and institutional arrangements were evident[5].

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3. Philip Kotler, Marketing Management, (New Delhi; Prentice Hall of India Limited, 1989), p.9.

4. J. Thomas Russel and Ronald Lane, Kleppner's Advertising Procedure, (New Jersey : The Prentice Hall Series, 1990), p.78.

5. Barkely Hill, An Introduction to Economics for Students of Agriculture, (Oxford : Pergum Press, 1980), p.91.

According to Larson, a market might be broadly described as the entire area within which the forces of demand and supply of given commodity or service interact in effective exchanges thereby establishing prices. Thus whenever and wherever buyers and sellers were brought together through whatever means of communication, market existed[6].

Cundiff and Still defined market in terms of buyers and sellers as the aggregate of forces or conditions within which buyers and sellers make decisions that resulted in the transfer of goods and determination of prices, namely, value in exchange[7].

In the same way Acharya and Agarwal referred market as a social institution which performed activities and provided facilities for exchanging commodities between buyers and sellers[8].

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6. Adlowe L. Larson, "Agricultural Marketing", (New York : Prentice Hall, 1983), P.33-34.

7. E.N. Cundiff and R.Still, "Basic Marketing Concepts, Environment and Decisions", (New Delhi; Prentice Hall of India Private Ltd., 1986), p.21.

8. S.S.Acharya and N.L.Agarwal, "Agricultural Marketing in India", (New Delhi : Oxford and IBH Co., 1987), p.9.

Narain opined that the term market had no reference to a place where the goods were bought and sold; but to a single commodity and the buyers and sellers of that commodity who were in free competition with one another[9].

Mitchell improved this concept and viewed that market must be thought of not as a geographical place but getting together of buyers and sellers in person or by mail or by anyother means of communication[10].

In the present study market is defined as any means of communication through which actual and potential buyers (farmers) and sellers (fungicide manufacturers) are in close interaction with one another for the purpose of buying and selling of fungicides.

MARKETING :

According to Elling marketing is ascertaining, creating and satisfying the wants of people and doing it with a profit[11].

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9. R.S. Narain, "Marketing - An Introductory Analysis", (Delhi : S.Chand and Co., 1991), p.26.

10. Mitchell, "Elements of Marketing", (New York : The MacMillan Co., 1964), p. 3.

11. Karl A. Elling, Introduction to Modern Marketing, An Applied Approach, (New York; The MacMillan Co., 1969), p.5.

According to Bell, marketing is a management task of strategically planning, directing and controlling the application of enterpreneurial effort to profit making process that would provide consumer satisfaction, a task which involves integration of all business activities, including manufacturing, finance and sales in a fixed system of action[12].

Mamoria and Joshi had the same view. Further they viewed marketing as the father of innovation and product development promoter of enterpreneurial talent, developer of economy, stimulation of consumption and higher standard of living and guardian of price system[13].

Stanton improved the above and defined marketing as a total system of business activities designed to plan, price, promote and distribute, want satisfying goods and services to potential customers[14].

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12. Martin L. Bell, "Marketing Concepts and Strategy", (London : Macmillan and Company Ltd., 1966), p.7.

13. C.B. Mamoria and R.L. Joshi, "Principles and Practices of Marketing in India", (Allahabad:Kitab Mahal, 1975), p.8.

14. William J. Stanton, op. cit., p.74.

According to Prasad, the new concept of mega marketing was an attempt to systematise the practices that have been evolved by creative and forward looking marketing men[15].

All the above marketers had defined marketing from the view point of a firm. Whereas Acharya and Agarwal considered marketing in a macro level and defined it as a series of activities involved in moving the goods from the point of production, to the point of consumption. It included all the activities involved in the creation of time, place, form and possession of utility[16]. This definition follows that of American Marketing Association which defined marketing as the performance of business activities that directed flow of goods and services from the producer to the ultimate consumer[17].

Kotler had combined both micro and macro approaches and defined marketing as a social and managerial process by which individuals and groups obtain what they need

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15. B.R.S. Prasad "Mega Marketing", **Indian Management**, 27(2): p.28-29, 1988.

16. S.S. Acharya and N.L. Agarwal, op.cit., p.2, 1987.

17. R.P. Buzzel, J.B. Mathews and T.Levih, Quoting American Marketing Association in "**Marketing and Introductory Analysis**", (New York:McGraw Hill Book Company, 1974), p.13.

and want through creating and exchanging products and value with others[18].

For the present study, marketing referred to all activities involved in the flow of fungicides from the manufacturers to the farmers.

MARKET POTENTIAL

Stanton defined market potential as the total expected industry sales for a product in a given market over a certain time period[19].

SriVastava viewed the market potential as the limit approached by market demand as industry's marketing effort gives to infinity for a given environment. He also opined that market potential would always be greater than the market forecast[20].

Evans and berman further improved the above and stated that the market potential represented the maximum industry sales for a specific product or service to a specific customer

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18. Philip Kotler, op.cit., p.9, 1989.

19. William J. Stanton., op.cit., p.170.

20. M.G. Srivastava, "Patterns and Pitfalls of Pesticides ForeCasting", Pesticides, 19(4):pp.15-20, 1985.

specific period of time under a well defined level of marketing activity[21].

The following marketers also correlated the market potential to a maximum sales limit.

Dale considered market potential as the maximum sales of a product that could be achieved per time period for a specified environment and a specified marketing effort[22].

Cundiff defined market potential as the maximum possible sales opportunity open to all sellers of a good or service during a stated future period for a particular marketing segment[23].

Ramaswamy and Namakumari referred to market potential as a quantitative estimate of the total possible sales by all the firms selling the product in a given market. It gives an indication of the maximum demand for the product assuming that

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21. Joe R.Evans and Barry Berman, Marketing, (New York : Heritage Publishers, 1985), p.252.

22. Dale Litter, "Marketing and Product Development", (New Delhi: Heritage Publishers, 1985), p.252.

23. Edward W Cundiff, "Fundamentals of Modern Marketing", (New Delhi : Prentice Hall of India Private Ltd., 1985), p.104.

the ideal marketing effort is made[24].

Thus all the researchers defined market potential as the total expected sale of a product. Accordingly, for the present study, the quantitative estimate of the maximum sales opportunities of chlorothalonil for the period 1995-96 and 1999-2000 was considered as the market potential.

PROMOTION :

Banks included intermediate consumers and described promotion as all the activities designed to induce intermediate and ultimate consumers to buy a product or service other than normal sales call, media advertising and publicity[25].

Verma and Singhal defined promotion as those marketing activities, other than personal selling, advertising and publicity that stimulate consumer purchasing and dealer effectiveness, such as displays, shows, expositions and various

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24. V.S. Ramaswamy and S.Namakumari, Marketing Management, (New Delhi : S.G.Wasani MacMillan India Ltd., 1990), p.160.

25. Seymour Banks, "Trends Affecting the Implementation of Advertising", Journal of Marketing, 37(1):pp.19-28, 1973.

non-recurrent selling efforts not in the ordinary routine[26].

Vetriselvan contradicted with above concepts. He viewed promotion as a series of activities like personal selling, advertising, dealer incentives, direct mail campaign aimed at promoting sales of a product or services in a short run among consumers or dealers[27].

Wright defined promotion as an activity or effort or attempt made to influence the choice behaviour of some market segment[28].

Stanton defined promotion as an exercise in information, persuation and communication and these three were interrelated[29].

Stanton's concept was improved by Vijayachandran and he defined promotion to denote all methods adopted for

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26. D.P.S. Verma and D.K. Singhal "Advertising and the Consumer Interest", Indian Journal of Marketing, 13(6-7), pp.3-7, 1983.

27. P. Vetriselvan, "A study of Market, Market structure and Marketing Fertilizer in Thanjavur District", (Unpublished M.Sc.(Ag.) Thesis, Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1978), p.19.

28. Peter L. Wright, "Use of Consumer Judgement Models in Promotion Plant", Journal of Marketing, 37(4):p.27, 1973.

29. William J Stanton, op.cit., p.431.

persuasive communication. It would help to convert a potential buyer into an actual buyer[30].

In this study, promotion denotes all the efforts carried out by marketing firm such as advertising, sales promotion, publicities and improved communication facilities to improve their sale volume of fungicides.

ADVERTISING

Day found advertising as a role in motivating the people and gaining acceptance of a new or established product but word of mouth was needed to maintain interest and to effect purchase[31].

American Marketing Association defined advertising as any paid form of nonpersonal presentation and promotion of ideas, goods and services by an identified sponsor[32].

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30. P.K. Vijayachandran, "Fertilizer Promotion", Indian Journal of Marketing, 13(5):pp.9-13, 1983.

31. S.Day, "Attitude change, Media and Word of Mouth", Journal of Advertising Research, 2(12):pp.31-40, 1982.

32. Committee Reports : "Reports of the Definition Committee", The Journal of Marketing, 13(2):p.213, 1988.

The above definition was supported by Stanton, Kannan and Bansal.

Bansal defined advertising as a very visible form of marketing activity and one of the utmost importance to many industries. He was very specific and referred to mass communication given through paid media for the benefit of its sponsor[33].

According to Stanton, advertising consists of all the activities involved in presenting to a group, a non-personal, oral or visual, openly sponsored message regarding a product, service or idea[34].

Kannan viewed advertising as any paid form of non-personal presentation of messages regarding any product by an identified sponsor using media such as leaflets, posters, magazines, radio, television etc[35].

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33. S.C. Bansal, "Advertising Expenditure", Indian Journal of Marketing, 12(12):pp.3-7, 1983.

34. Stanton, op.cit., p.577.

35. R. Kannan, "An Analysis of Demand for FACT Fertilizers and Their Promotional Strategies" (Unpublished M.Sc.,(Ag.) Thesis, Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1991), pp.11-12.

For the present study, advertising means presentation of messages regarding fungicides, through all the audio visual aids, to the farmers, by the fungicide manufacturing firms.

USE-PATTERN

Use pattern embodies the combination of all factors involved in the use of pesticides, including the concentration of active ingredient in the preparation, rate of application, time of treatment, number of treatments, use of adjuvants, methods and sites of application which determine the quantity applied, timing of treatment, and interval before harvest[36].

For the present study the above concept is followed for use pattern.

PERCEPTION

Rao defined perception as the intellectual process by which a person acquires the information from the environment, organise it and obtain the meaning from it[37].

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36. Food and Agriculture Organisation, "International Code of Conduct on the Distribution and Use of Pesticides", Pesticides Information, 14(2): p.26, 1988.

37. V.S.P. Rao, "Pesticide Use - Farmers' Attitude", Pestology, 12(2):p.21, 1989.

Manmoan and Prabhakar defined perception as the process by which an individual selects, organises and interpret stimuli into meaningful and coherant picture of the world[38].

Narayanan defined it as the psychological process whereby people select, organise and interpret sensory stimulations into meaningful informations about their environment[39].

For the present study perception means the process of interpretation of informations viz., price, control of disease, side effect to the crops, safety to handle, availability in the market, compatability with pesticides, regarding fungicides, by the farmers.

REVIEW OF PAST STUDIES

Singh et al., concluded that the price of farm inputs adversely affected the level of their utilization on one hand and the level of farm productivity on the other. The use of farm inputs like fertilizers, irrigation and pesticides by farmers were curtailed due to the exorbitant rise in

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38. B.K. Manmoan Singh, B.V. Prabhakar, "Consumer Perception of Certain Product Feature of Steel Almirah", Indian Journal of Marketing, 19(5):pp. 17-26, 1989.

39. O.R. Narayanan, "Perceptional Process", Yojana, 8(3):p.32, 1990.

the pirce of the inputs[40].

Marothia also reported that inspite of the increase in the prices of pesticides, the level of use of the same increased considerably in crops like maize, paddy and wheat. The increase was attributed to the fact that the capital intensive farmers had understood the economic significance of use of pesticides in crop production and storage[41].

Mahalla and Jha concluded that likely state of infestation must be explicitly taken into account before recommending pesticide use since an increase in the level of infestation resulted in an increase in the rate of pesticide use. It was also evidenced that even in the years of low pest infestations, the returns to optimum use of pesticides were very high[42].

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40. R.I. Singh, G.N. Singh, R.K. Singh and V.Prasad, "Impact of Input Prices on Level of Their Use", Indian Journal of Agricultural Economics, 28(4): PP. 201-204, 1973.

41. D.K. Marothia, "Impact of Increase in Input price", Indian Journal of Agricultural Economics, 31(3): pp. 81-85, 1976.

42. Y.P. Mahalla and Dayanantha Jha, "Economics of Pesticide Use In Cotton Production", Indian Journal of Agricultural Economics, 32(1):pp.120-136, 1977.

Rajagopalan opined that the investment in pesticides was not oriented towards yield increase but towards yield loss minimisation. Increase in area under high yielding varieties, high levels of fertilizers use and the intensive cropping had made farming complex and costly and the farmers in their anxiety to save the crop used more than the recommended doses of pesticides[43].

Mann analysed the cropwise use of pesticides and use pattern and found that the use of pesticides in pulses and oil seeds were considerably low, while it was highest for cotton[44].

Seetaprabu concluded that pesticide use decisions of cultivators were based on their expectations regarding the time and intensity of pest attack and the effectiveness of the pesticides[45].

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43. V. Rajagopalan, "Deceleration of Rates of Agricultural Growth in Tamil Nadu", Indian Journal of Agricultural Economics, 38(4): pp.568-584, 1983.

44. B.P.S. Mann, "Role of Pesticides in Agriculture", Pesticides Information, 10(3) : pp 17-18, 1984.

45. K. Seetaprabu, "The Treatment of Pesticides", Indian Journal of Agricultural Economics, 40(2):pp.123-139, 1985.

Rao observed that the dry powders constituted the maximum portion of the total quantity of pesticides usedc by different size group of farmers[46].

Kahlon and Grewal reported that the cultivators were not fully convinced of the merits of plant protection practices; they believed that the insecticides were too costly and they lacked the technical know how for carrying out control measures. Apart from these, untimely and inadequate quantities of pesticides available in the Cooperatives also inhibited the pesticide usage[47].

Desai reported that pesticides would be more readily demanded for high value crops which were suceptible to intense pest attack than for low value crops. Secondly, bouyancy in demand for pesticides use depended on price, crop yield expectation and the increased use of other yield increasing

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46. A. Nageswara Rao, "Economics of Different Forms of Pesticides Use in Andhra Pradesh", Pesticides Information, 20(7):pp.19-23,1986.

47. A.S. Kahlon and Suk Dev Singh Grewal, "A Study of Subsidised Insect Pests Control Measures", Indian Journal of Agricultural Economics, 20(3):pp. 54-62, 1985.

inputs like fertilizer and irrigation[48].

Kalugasalamurthy found that the use of fungicides was less(33 percent) as compared to insecticides in cotton and groundnut farms. He also viewed that the farmers' awareness about the fungal diseases and fungal disease monitoring were poor. Most of the farmers were not able to realise the yield loss due to fungal diseases, especially in groundnut[49].

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48. Gunwant M. Desai, "Factors Determining Demand for Pesticides", Economic and Political Weekly, 5(52), pp.181-183, 1990.

49. S. Kalugasalamurthy, "Fungicides Marketing in Tamil Nadu", (Unpublished M.Sc.(Ag.) Thesis, Department Agricultural Economics Tamil Nadu Agricultural University, Coimbatore), 1991.pp. 138-143

DESIGN OF THE STUDY

CHAPTER III

DESIGN OF THE STUDY

The Research methodology adopted in the study is presented in this chapter under the following subheads.

1. Selection of study area cultivating these crops.
2. Selection of major crops succeptible for fungal diseases.
3. Selection of farmers and dealers.
4. Collection of data to fulfil the set objectives.
5. Tools of Analysis.

SELECTION OF STUDY AREA.ls 2

Coimbatore and Nilgiris districts were selected purposively since the case firm was interested in these districts. Totally nine blocks, six in Coimbatore district and three in Nilgiris district, were selected by random sampling method adopting crop complex approach. From each block one village was selected randomly. The selected blocks and villages are as follows.

District	Block	Village
1.Coimbatore	1.Mettupalayam	Alankombu
	2.Sarkar Samakkulam	Sarkar Samkkulam
	3.Pongalur	Kattur
	4.Anamalai	Sethumadai
	5.Udumalaipettai	Pethappampatti
	6.Madathukulam	Madathukulam
2.The Nilgiris	1.Udhagamandalam	Ethallar
	2.Kothagiri	Peddakatta
	3.Gudalur	Thorappalli

SELECTION OF CROPS

A wide range of fungal diseases occur in all the cultivated crops. Anyhow, for the present study those crops on which the chemical, chlorothalonil, can be applied were selected. This includes paddy, groundnut, sesamum, sunflower, grapes, vegetables like chillies, brinjal, tomato, carrot, cabbage, potato and plantation crops like tea and coffee. The hill vegetables and plantation crops are to be necessarily included since they are raised in climate and humidity which are more conducive for the occurence and spread of fungal diseases at a faster rate.

SELECTION OF RESPONDENTS:

From each block 15 farmers were selected using random sampling technique. Thus totally 135 farmers were selected constituting 0.05 percent of total farmers of the study area. Similarly 36 dealers, four from each block, were randomly selected covering 0.5 percent of the dealers in the study area.

DATA COLLECTION FOR THE STUDY

Primary Data

Primary data were collected from farmers and dealers using well structured and pretested interview schedules. Seperate interview schedules were used for farmers and dealers.

Secondary Data

Secondary data such as locaction, soil type, climate and rainfall, cropping pattern, irrigation pattern, land use pattern, cropped area, number of pesticide distribution outlets etc., were collected from the Departments of Statistics, Agriculture and horticultural Research Station, Udhagamandalam.

Study Period

Field survey and collection of secondary data were carried out during Septemper, October, November and December 1994. The study period relates to the year 1993-94.

TOOLS OF ANALYSIS

Garett's Ranking Technique

Garett's Ranking technique was used to estimate the influence of different factors in selection of a particular brand of fungicide by farmers and the quantity used by them.

In this technique, the order of merit assigned by the respondents were converted into percent position by using the following formula:

$$\text{Percent Position} = \frac{100\,(R_{ij} - 0.5)}{N_j}$$

Where, R_{ij} = Rank given for i^{th} factor by the jth individual

N_j = Number of factors ranked by the jth individual

By referring to Garett's table, the percent position estimated were converted into scores. For each factor,

the scores of various respondents were added and mean values were estimated. The mean values obtained were arranged in descending order. The factor with the highest mean value was considered to be the most important one.

COMPOUND GROWTH RATE

Compound growth rate was estimated to project the area under different crops during 1995-96 and 1999-2000 A.D so as to arrive at market potential for cholorothalonil. Fifteen years data, ie., from 1977-78 to 1992-93 was used for the purpose for each crop selected. Compound growth rate was derived as follows.

$$Y = AB^{t}$$

Where, Y = Area of crop (in ha)

A = Constant term

B = Parameter to bo estimated

t = Time measured in years.

By taking logarithm on both sides of equations,

$$\log Y = \log A + t \log B$$

By putting,

$$\log A = a$$

$$\log B = b$$

the equation becomes

$$\log Y = a + bt$$

This is a log linear function with the independent variable t and dependant variable Y. The compound growth rate was obtained by using the formula,

$$CGR = (\text{Antilog } b - 1) \times 100.$$

Using the compound growth rate, area under the selected crops were projected as follows;

$$Y = Y_0 \, (1 + r/100)^n$$

Where, Y = Projected area (in ha) for a crop

Y_0 = Area under the crop during the base year

r = Compound growth rate (CGR)

n_i = No. of ith year to be projected.

Chain Ratio Method

Chain ratio method was used for the estimation of market potential for chlorothalonil.

$$M_{p(s)} = Q_{A(s)} \times P_A \times D$$

Where $M_{p(s)}$ = Market potential for a chemical

$Q_{A(s)}$ = Total projected area under selected crop "s"

P_A = Percentage of crop area for which fungicides applied

D = Recommeded dose of chemical for crop "s"

The area was projected by CGR method and percentages for the estimates were obtained based on findings of field survey. Thus cropwise market potential for chlorothalonil was estimated for the years 1995-96 and 1999-2000.

Besides these, percentage analysis was used wherever necessary.

DESCRIPTION OF THE STUDY AREA

CHAPTER IV

DESCRIPTION OF THE STUDY AREA

This chapter briefs the description of the study area with reference to its agricultural importance.

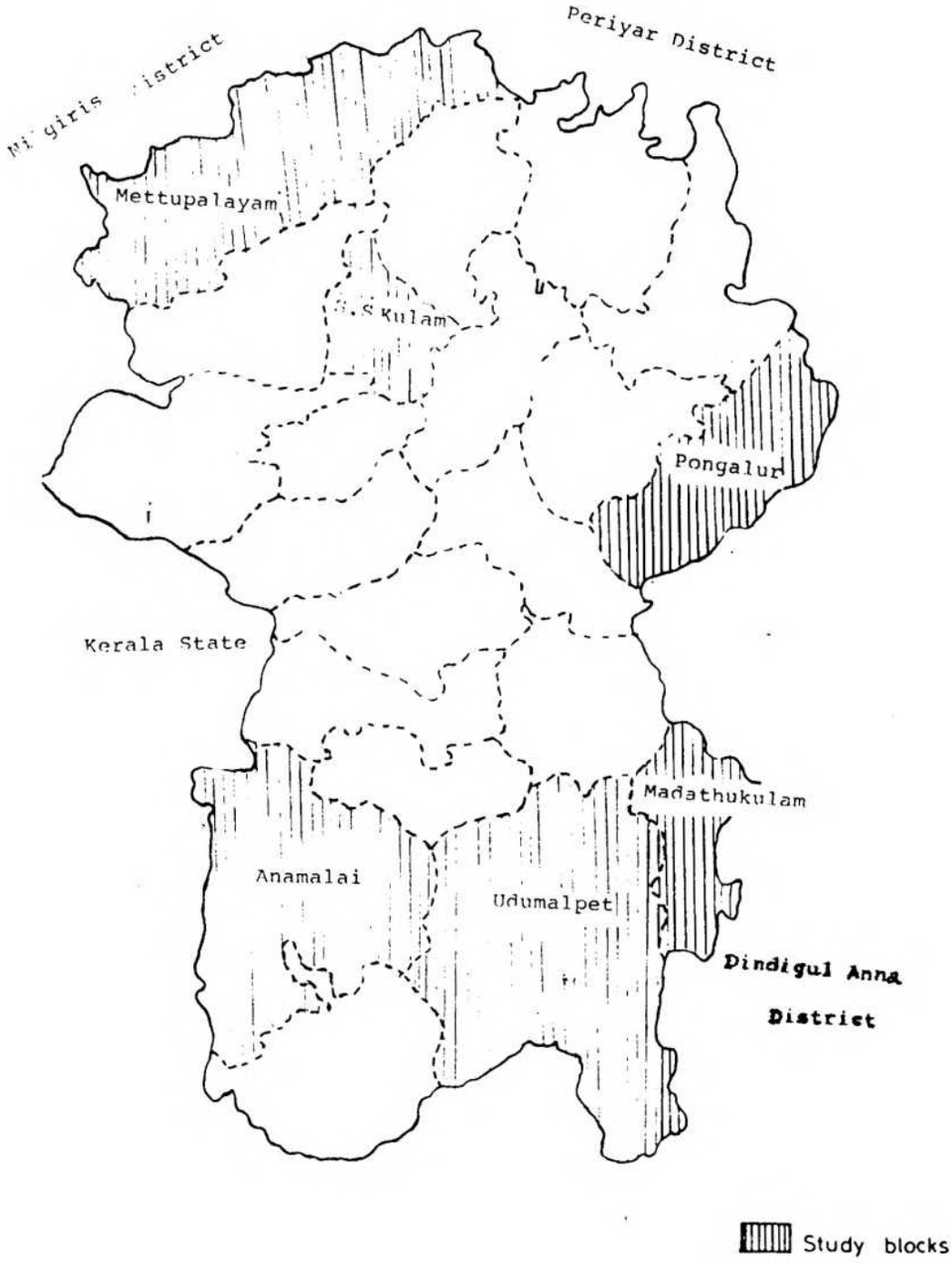
It is the agricultural situation which mainly decides the market environment for marketing of any agricultural input. In marketing of fungicides, it is essential to review the agricultural situation of the selected study regions in order to understand the macro environmental factors which will have direct or indirect impact on marketing activities.

COIMBATORE DISTRICT

Location

Coimbatore district is located in the Southern part of Deccan Peninsula. It is an inland district with a total geographical area of 7,43,135 hectares. It lies between 10° $10'$ and 11° $30'$ of Northern latitude and 76° $40'$ and 77° $30'$ of Eastern longitude. The district is bound by Madurai and Periyar districts on the East, Dindigul Anna District on the South and Kerala State on the West. The Nilgiris mountain ranges touches the district on its northern border and merges with Western Ghats.

MAP OF COIMBATORE DISTRICT



The district has three revenue divisions, nine taluks, 181 revenue villages administered thourgh 21 panchayat unions, 58 town panchayats and 389 Village Pangchayats.

Demography

The population of the district is 35.31 lakhs as per 1991 Census. The Population density is 191 per Sq. Km., in rural area and 1,687 per Sq. Km., in Urban area. Out of the total population of 35.31lakhs, 1,61,453 are workers (45.73 percent). This includes 1,88,652 of cultivators (11.68 percant) and 456326 of agricultural labourers (28.26 percent). The labour available for agricultual operations declined to 28.26 percent compared to 31.67 percent in 1981.

Climate and Rainfall

The climate of the district is normally pleasant due to its location bordering Western Ghats. April and May are the hottest months and January and February are the cold months. The temperature ranges from 17.8 ^{o} C to 35 ^{o} C. Tropical climate prevails all through the year with bright sunshine except for a few days during the cold months. The normal annual rainfall is 711.30 mm. Variation in rainfall forces the farmers to take up variety of crops both under irrigated and rainfed conditions.

TABLE-IV

RAINFALL PATTERN OF COIMBATORE DISTRICT (1992-93)

Sl.No.	Period	Rainfall in mm
1	South - West Monsoon (June -September)	208.3 (30.16)
2	North - East Monsoon (October - December)	307.3 (44.49)
3	Winter (January - February)	22.9 (3.32)
4	Hot Weather (March - May)	152.2 (22.03)
	Total	690.7 (100.00)

Source: Records of Assistant Director of Statistics, Coimbatore, 1993-94.

Note : Figures in parentheses indicate percentage to total

Soil Types

Soils of the district are generally black, red and red loam. Sandy and Sandy loam soils are also present in large tracts in Pollachi, Coimbatore and Palladam taluks. These soils are of both calcarious (3,170.71 Sq Km) and Non-Calcarious (8,884.22 Sq Km) in nature. A large proportions of soils are dark reddish brown, medium textured and well drained with rapid permeability. Hence these soils are well suited for raising a wide variety of crops both under rainfed and irrigated conditions.

Land Use Pattern

The total geographical area of the district is 743135 hectares. Out of it the net area under cultivation was 322101 hectares and the gross area sown was 351186 hectares in 1992-93. The area of the land put under various categories of use are shown in Table -V.

Irrigation

Wells forms the major source of irrigation in the district. The details on area irrigated by different sources in the district is presented in Table VI.

TABLE-VI

SOURCES OF IRRIGATION IN COIMBATORE DISTRICT 1992-93

(Area in ha)

S.No	Sources of Irrigation	Area Irrigated	
		Net Area	Gross Area
1.	Wells	83610(61.2)	90531(62.5)
2.	Canals	51339(37.6)	51885(35.8)
3.	Tanks	1690(1.2)	2471(1.7)
	Total	136639(100.0)	1,44,887(100.0)

Note : Figures in parentheses indicates percentage to the total.

Source : Records of Assistant Director of Statistics, Coimbatore, 1993-94.

TABLE-V

TALUKWISE LAND USE PATTERN OF COIMBATORE DISTRICT IN 1992-93

(Area in ha)

Sl No	Particulars	Area in Udumal-pet	Pollachi	Valparai	Coimbatore(S)	Coimbatore(N)	Pallada-m	Mettupalayam	Tirupur	Avinashi	Total
1	Area under Forest	46930	96	46288	20084	16505	228	30397	-	219	160747(21.63)
2	Barren and uncultivable land.	1838	804	96	2348	1495	10882	2737	107	7667	28976(3.91)
3	Cultivable wastes	218	170	-	334	459	249	584	120	183	2317(0.31)
4	Permanent Pasture and grazing lands.	32	351	-	237	173	50	796	16	18	1673(0.23)
5	Land under miscellaneous crops and groves not included in the net area sown	13538	13838	1951	7894	12084	356	6254	6316	95	62310(8.38)
6	Current fallow land.	23637	21425	2581	18422	7241	37414	266	25459	7042	143487(19.31)
7	Other fallow land	601	12	240	612	1422	2814	6522	7540	7145	21508(2.89)
8	Net area sown	56819	79921	15808	26452	19846	36262	13969	23764	49260	322101(43.34)
9	Area sown more than once	5760	3817	720	1308	2672	3260	2689	1908	7011	29085
10	Gross croped area	62579	83738	16528	27760	22518	39462	16658	25672	56271	351186
	Total Geographical area	143613	116617	66964	77383	59225	88255	61527	63322	66229	743135(100)

Source : Records of Assistant Director of Statistics, Coimbatore, 1993-94.

About 61.0 percent of net irrigated area and 62.0 percent of gross irrigated area were covered by well irrigation. Area irrigated by canals and tanks constituted 37.6 percent, and 1.20 percent of net irrigated area respectively.

Crop Rotation

In Coimbatore District several crop rotations are followed. The major rotations followed are outlined below.

Wet Land

1. Paddy-Paddy-Pulse
2. Paddy-Sugar cane

Garden Land

1. Groundnut - Cotton
2. Cholam - Cotton
3. Millets - Vegetables
4. Turmeric
5. Banana
6. Sugar Cane

Dry Land

1. Cholam _ Gingelly
2. Cumbu _ Gingelly

3. Pasture grass - Bengal gram

4. Ground nut _ Groundnut

5. Ground nut - Pulses.

The above mentioned crops are raised in the following season.

crop	season.
1. Paddy	1. Kuruvai (June-September)
	2. Samba (Aug -Jan)
	3. Navarai (January -April)
2. Pulses	
i)Irrigated	1. April-June
	2. June-August
ii) Rainfed	1. April - June
	2. July - September
	3. November-January
3. Sorghum	
i) Irrigated	1. January - April
	2. March - June
ii)Rainfed	1. April - July
	2. July - October
	3. September - December

TABLE VII

MAJOR CROPS CULTIVATED IN COIMBATORE DISTRICT IN 1992-93

Sl. No	CROPS	TOTAL AREA CULTIVATED (HA)	PERCENTAGE TO TOTAL CULTIVATED AREA
1.	Paddy	27034	8.4
2.	Sorghum	89883	27.9
3.	Maize	15958	5.0
4.	Pulses	28987	9.0
5.	Cotton	25051	7.8
6.	Groundnut	59401	18.4
7.	Sunflower	1961	0.6
8.	Gingelly	2761	0.9
9.	Sugarcane	12160	3.8
10.	Turmeric	1032	0.3
11.	Vegetables	3847	1.2
12.	Banana	1781	0.6
13.	Grapes	249	0.1
14.	Cardamom	994	0.3
15.	Coffee	3142	1.0
16.	Tea	9753	3.0
17.	Others	38,107	11.7
	Total	322101	100.0

Source : Records of Assistant Director of Statistics, 1993-94, Coimbatore.

Note : Others includes coconut, flowers.

4. Maize	Sown throughout the year mainly from January to September
5. Groundnut	
i)Irrigated	1. December- March
ii)Rainfed	1. April - July
	2. June - September
6. Cotton	
i)Irrigated	August-February and February-July,
ii)Rainfed	October-March

The major crops grown in the district during the year 1992-93 are shown in Table VII. Sorghum was the major crop in the district followed by groundnut, pulses, paddy, cotton and maize which occupied 27.9, 18.4, 9.0, 8.4, 7.8 and 5.0 percent of the net area sown respectively during 1992-93.

Fungicide distribution

Fungicides are distributed through 538 outlets which includes 54 Government depots, 137 Co-operative agencies and 347 private dealers.

NILGIRIS DISTRICT

LOCATION

The Nilgiris lies between 11° and 11° $55'$ of Northern Latitude and 77° $2'$ of Eastern longitude with Kerala State on the West, Karnataka on the North and Coimbatore district on the East and South. The Altitude ranges from 1000 to 2,760 m above MSL. The district with a total area of 2,549 sq. km has its head quarters at Udhagamandalam. There are four revenue taluks namely uthagamandalam, Coonoor, Kothagiri and Gudalur. The total number of revenue villages in the district are 54. The population of the ditrict was 7,04,827 and population density was 277 per sq. km as per 1991 census.

Agricultural Demography

The total number of cultivators were 18,867 and that of Agricultural labourers were 37,806 and they accounted for 2.68 percent and 5.36 percent respectively to the total population of the district as per 1991 census.

Climate and Rainfall

The average rainfall of the district is 1186 mm. But it received a rainfall of 1011.17 mm in the year 1992-93. The minimum and maximum relative humidity of the district are 52 percent and 96 percent respectively.

NILGIRI DISTRICT

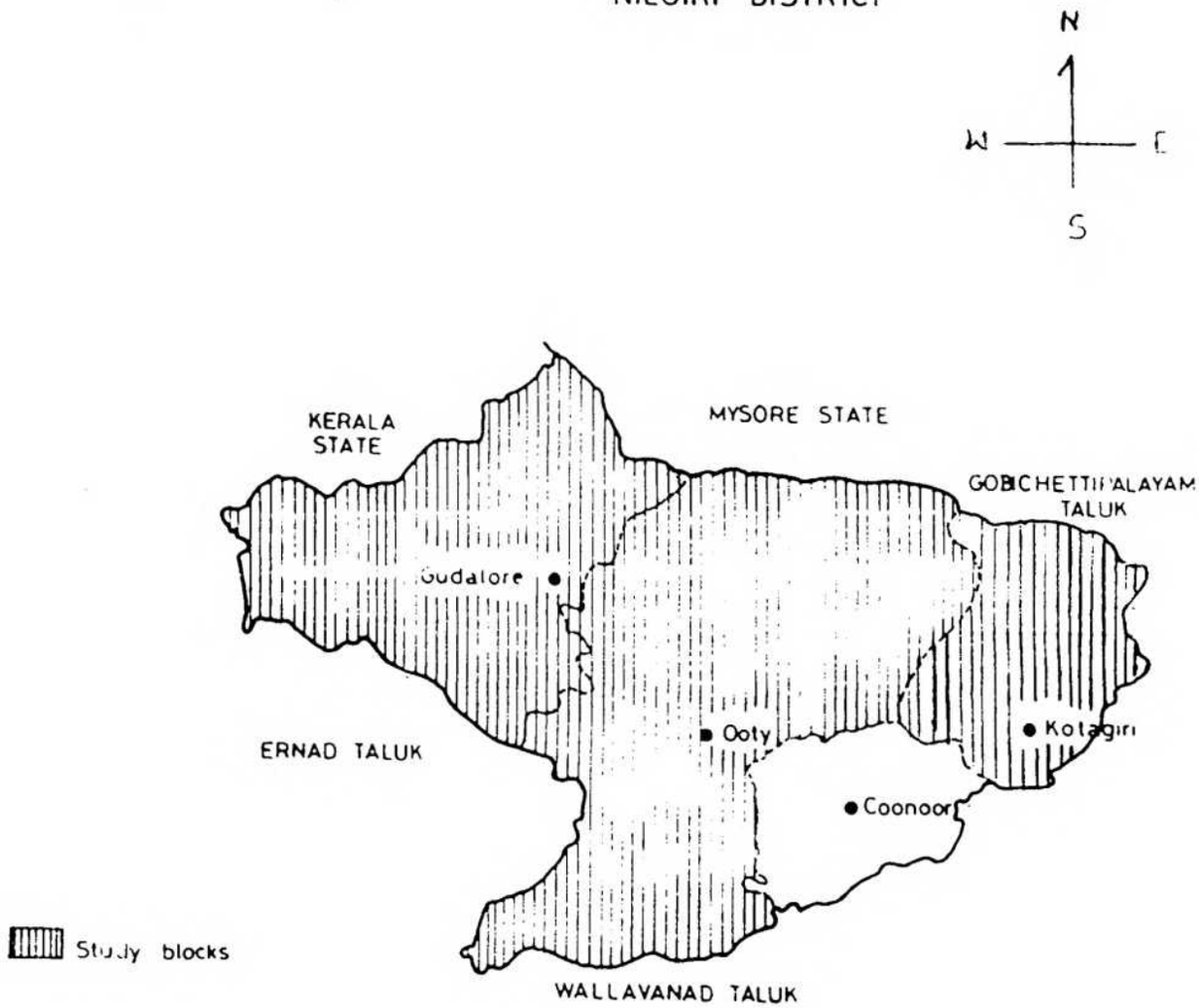


TABLE-VIII

RAINFALL PATTERN OF NILGIRIS DISTRICT (1992-93)

S. No	Period	Rainfall in mm
1.	South-West Monsoon (June-September)	499.4(43.44)
2.	North-East Monsoon (October-December)	510.6(44.42)
3.	Winter (January-February)	2.0(0.18)
4.	Hot Weather (March-May)	137.5(11.96)
	Total	1149.5(100.00)

Note : Figures in parentheses indicate percentage to the total

Source : Records of Assistant Director of Statistics, Uthahamandalam, 1993-94.

The temperature exhibits wide fluctuations ranging from 0° C to 25° C. April, May and June months represents the maximum temperature period, while the coldest months are November, December and January. During these cold months, frost occurs frequently which adversly affects the growth and yield of vegetable crops including potato.

Soils

Lateritic soil and red sandy soil are predominantly available. The other soils are red loam and black soil. The fertility status is medium to high with limited

nutritive relative capacity because of its loose and friable soil structure. The soils are highly acidic with p^H ranging from 3.8 to 6.2.

Land use Pattern

The total geographical area of the district is 2,54,881 ha of which the net cropped area was 70,854 ha constituting 27.8. percent of the geographical area during 1992-93. The overall land use pattern of the district in the year 1992-93 is in Table-IX.

Irrigation

Canals, Wells and Springs form the major sources of irrigation and the irrigation potential is very low in the district. The total irrigated area was 621.51 ha during 1992-93 which accounted for only 0.87 percent of the gross croped area as shown in Table X. Due to heavy rain fall, irrigation sources were not developed by either private individuals or government by way of constructing irrigation dams.

TABLE - IX

LAND USE PATTERN-TALUKWISE IN 1992-93

(Area in Ha)

Sl	Land Use Pattern	Udhagai	Connoor	Kothagiri	Gudalur	Total
1.	Area under Forest	80633	4889	20204	37633	143359(56.2)
2.	Barren & Uncultivable wastes	4668	1003	1991	1350	9012(3.5)
3.	Cultivable Waste	1386	76	1213	818	3493(1.4)
4.	Permenant Pasture & Grazing lands	1878	478	2040	904	5298(2.1)
5.	Land Under miscell -aneous tree & groves not included in net sown area	1672	1202	266	318	3458(1.4)
6.	Current Fallows	6945	1081	-	3657	11683(4.6)
7.	Other Fallow lands	3770	208	2044	1700	7722(3.0)
8.	Net area sown	18812	13842	11908	26292	70854(27.8)
9.	Area Sown more than once	-	1	921	383	1305
10.	Gross Cropped area	18812	13483	12829	26675	71659
11	Total Geographical area	119764	22279	39666	72672	254881 (100.00)

Note : Figures in parentheses indicate percentage to the total

Source : Records of Assistant Director of Statistics, Uthahamandalam, 1993-94.

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TABLE X

SOURCES OF IRRIGATION IN NILGIRIS DISTRICT(1992-93)

Sl. NO	Sources of Irrigation	Area irrigated (Ha)
1.	Canals	420.51(67.66)
2.	Wells	50.00(8.04)
3.	Springs	151.00(24.30)
	Total	621.51(100.00)

Note : Figures in parentheses indicate percentage to total

Source : Records of Assistant Director of Statistics, Uthahamandalam, 1993-94.

Cropping Pattern

Perennial crops viz., tea and coffee occupies a larger portion of area under cultivation. Annual crops are grown in three season as follows.

1. Main season March-April to August-September
2. Irrigated season January-February to May-June
3. Autumn season August-September to December-January.

Tea is the major crop followed by coffee, potato, carrot, cardomom and cabbage in order as shown in Table XI.

TABLE XI

MAJOR CROPS CULTIVATED IN NILGIRIS DISTRICT IN 1992-93

Sl. No	CROPS	TOTAL AREA CULTIVATED (HA)	PERCENTAGE TO TOTAL CULTIVATED AREA
1.	Tea	47974	66.95
2.	Coffee	9610	13.41
3.	Potato	5734	8.00
4.	Carrot	1452	2.03
5.	Cardomom	1509	2.11
6.	Cabbage	796	1.11
7.	Radish	763	1.06
8.	Beans	676	0.94
9.	Garlic	496	0.69
10.	Peas	464	0.65
11.	Others	2185	3.05
	Total	71659	100.00

Source : Records of Assistant Director of Statistics, 1993-94, Uthagamandalam.

Note : Others includes Beetroot, Knol-khol, Cauliflower, Clove, Rubber, Paddy and Chinchona.

Size of Holdings

The number of farm holdings in the district is 48579. as per 1991 census . Marginal farmers constitute a major portion, viz., 74.67 percent followed by small, medium and big farmers, the details of which are presented below.

Group	Number	Percentage to total
Marginal Farmers	36272	74.67
Small Farmers	9796	20.17
Medium Farmers	1907	3.93
Big Farmers	604	1.23
Total	48579	100.00

Source : Records of Assistant Director of Statistics, 1993-94, Uthagamandalam.

Fungicide Distribution

Fungicides are distributed through 7 government depots, 32 co-operative agencies and 160 private dealers in the district.

RESULTS AND DISCUSSION

CHAPTER V

RESULTS AND DISCUSSION

The results of the data collected and analysed are presented in this chapter. For the sake of convenience, the results are presented in the following manner.

1. General profile of the farmers
2. Fungicide use pattern of the farmers
3. Farmers' perception about major fungicides
4. Market potential for Chlorothalonil
5. Competitors' promotional strategies

GENERAL PROFILE OF THE FARMERS

Understanding the buying behaviour of the market is the essential task of marketing. Marketing research calls for understanding and analysing the nature of consumers who decide the ultimate use of the products. This makes it necessary to study the profile of the consumers. Hence an attempt is made to study the profile of the selected farmers. This section explores the dynamics of farmers' profile.

SIZE OF OPERATIONAL HOLDINGS

The selected farmers were post-stratified into four groups based on their operative farm size and the details are furnished in Table - XII.

A majority of farmers, viz., 34.8 percent of the study area belonged to maximum size group with an area of more than 4.00 ha, followed by medium, small and marginal groups which constituted 28.9, 25.9 and 10.4 percent respectively. The same pattern was reflected in Coimbatore district while in Nilgiris district medium group occupied a larger share followed by small, big and marginal groups. They respectively constituted 31.1 percent, 28.9 percent, 22.2 percent and 17.8 percent of the selected farms in the Nilgiris.

FARMING EXPERIENCE

Table - XIII represents the farming experience of the sample farmers. Fifty percent of the selected farmers in Coimbatore had an experience of 11-to 20 years in farming and 44.4 percent of the farmers had same farming experience in Nilgiris district. Thirty and forty percent of farmers in Coimbatore and Nilgiris respectively had an experience of more than 20 years. The same pattern of experience was found among the

TABLE - XII

SIZE OF OPERATIONAL HOLDINGS OF THE SELECTED FARMERS

Sl No	Size of operational Holdings	Coimbatore		Nilgiris		Total	
		No	Mean Area(ha)	No	Mean Area(ha)	No	Mean Area (ha)
1.	Marginal (Upto 1.00 Ha)	6 (6.7)	0.67	8 (17.8)	0.5	14 (10.4)	0.57
2.	Small (1.01 -2.00 Ha)	22 (24.4)	1.33	13 (28.9)	1.77	35 (25.9)	1.12
3.	Medium (2.01 - 4.00 Ha)	25 (27.8)	2.14	14 (31.1)	48	39 (28.9)	2.31
4.	Big (More than 4.00)	37 (41.1)	6.34	10 (22.2)	21.92	47 (34.8)	9.66
	SAMPLE	90 (100.0)		45 (100.0)		135 (100.0)	

Note: Figures in Parentheses indicates the percentage to the total number of farmers in each district.

TABLE - XIII

FARMING EXPERIENCE OF THE SELECTED FARMERS (In years)

Sl No.	Farming Experience	Marginal Farmers	Small Farmers	Medium Farmers	Big Farmers	Total
A	Coimbatore District					
1	Upto 10 years	3 (50.0)	9 (40.9)	-	6 (16.2)	18(20.0)
2	11 to 20 years	1 (16.7)	11 (50.0)	13 (52.0)	20 (54.1)	45(50.0)
3	More than 20 years	2 (33.3)	2 (9.1)	12 (48.0)	11 (29.7)	27(30.0)
	Nilgiris District					
1	Upto 10 years	2 (25.0)	3 (23.1)	-	2 (20.0)	7(15.6)
2	11 to 20 years	4 (50.0)	6 (46.1)	6 (57.1)	4 (40.0)	20(44.4)
3	More than 20 years	2 (25.0)	4 (30.8)	8 (42.9)	4 (40.0)	18(40.0)

Note: Figures in Parentheses indicate the percentage to the total number in each category of farmers.

different groups also.

AGE GROUP OF SELECTED FARMERS

The sample farmers were grouped into four categories based on their age, the details of which are furnished in Table-XIV.

It could be seen from the table that in Coimbatore district 43.3 and 34.4 percent of farmers were in the age group of 31-45 years and 46-60 years respectively. The younger and older age group of farmers were very less, constituting respectively 17.8 and 4.5 percent of the selected farms in the district.

In Nilgiris district also the same type of situation was seen relating to age and the distribution holds good among the different size groups also.

EDUCATIONAL LEVEL

The educational level of the sample farmers are shown in Table - XV. A large proportion, ie., 37.8 percent of the farmers were illterates in Nilgiris district while this category constituted 18.9 percent only in Coimbatore district. On

TABLE - XIV

AGE GROUP OF SELECTED FARMERS

Sl No.	Age Group	Marginal Farmers	Small Farmers	Medium Farmers	Big Farmers	Total Farmers
A	Coimbatore District					
1	Less than 30 years	3 (50.0)	4 (18.2)	4 (16.0)	5 (13.5)	16 (17.8)
2	31 to 45 years	-	12 (54.5)	17 (68.0)	10 (27.0)	39 (43.3)
3	46 to 60 years	1 (16.7)	5 (22.8)	2 (8.0)	22 (59.5)	30 (34.4)
4	More than 60 years	2 (33.3)	1 (4.5)	2 (8.0)	-	5 (4.5)
B	Nilgiris					
1	Less than 30 years	1 (12.5)	-	1 (7.1)	-	2 (13.3)
2	31 to 45 years	5 (62.5)	9 (69.2)	6 (42.9)	4 (40.0)	24 (46.7)
3	46 to 60 years	1 (12.5)	2 (15.4)	4 (28.6)	5 (50.0)	12 (31.9)
4	More than 60 years	1 (12.5)	2 (15.4)	3 (21.4)	1 (10.0)	7 (8.1)

Note : Figures in Parentheses indicate the percentage to total number in each category of farmers.

TABLE - XV

EDUCATIONAL LEVEL OF SELECTED FARMERS

Sl. No.	Educational Level	Marginal Farmers	Small Farmers	Medium Farmers	Big Farmers	Total Farmers
A	Coimbatore District					
1	Illeterate	3 (50.0)	7 (31.8)	4 (16.0)	3 (8.1)	17 (18.9)
2	Primary	2 (33.3)	4 (18.2)	7 (28.0)	2 (5.4)	15 (16.7)
3	Secondary	1 (16.7)	9 (40.9)	13 (52.0)	21 (56.8)	44 (48.9)
4	Collegiate	-	2 (9.1)	1 (4)	11 (29.7)	14 (15.5)
B.	Nilgiris					
1	Illeterate	4 (50.0)	4 (30.8)	5 (35.7)	4 (40.0)	17 (37.8)
2	Primary	3 (37.5)	5 (38.5)	-	-	8 (17.8)
3	Secondary	1 (12.5)	3 (23.1)	7 (50.0)	4 (40.0)	15 (33.3)
4	Collegiate	-	1 (7.6)	2 (14.3)	2 (20.0)	5 (11.1)

Note : Figures in Parentheses indicate the percentage to total number in each category of farmers.

the other hand half of the farmers, ie., 48.9 percent were educated upto secondary level in Coimbatore district and it was 33.3 percent in the Nilgiris. Collegiate education was found to be minimum among the farmers of both the districts as shown in Table.

The factors viz., age, experience in farming and educational level of the sample farmers are analysed with an idea that these may have an influence over their purchase decisions which are discussed in the pages to come.

CROPPING PATTERN

Since the cropping pattern of the two districts vary very much due to the existing climatic conditions it is analysed separately for each district.

Details on cropping pattern, percentage area of each crop to the gross cropped area during the study year are presented in Table -XVI for Coimbatore district. Sorghum occupied more than one fourth of the gross cropped area in the district followed by paddy, groundnut (rainfed), groundnut (irrigated) and vegetables including onion constituting 25.79 percent, 17.18 percent, 17.12 percent and 6.57 percent of the total cropped area

TABLE - XVI

CROPPING PATTERN OF SELECTED FARMS - COIMBATORE DISTRICT

Sl. No	Crops	Total Area (Hectare)	Percentage to Gross cropped Area
1	Paddy	65.0	17.18
2	Sorghum	97.6	25.79
3	Maize	23.2	6.13
4	Groundnut - Irrigated	59.6	15.75
5	Groundnut - Rainfed	64.8	17.12
6	Cotton	10.8	2.85
7	Onion	12.4	3.28
8	Chillies	4.0	1.06
9	Brinjal	3.4	0.89
10	Bhendi	3.2	0.85
11	Tomato	1.84	0.49
12	Banana	5.6	1.48
13	Other Crops	27.0	7.13
	Total	378.44	100.00

Note : Other crops include Gingelly, Grape,Coconut, and Sugar Cane.

TABLE - XVII

CROPPING PATTERN OF SELECTED FARMS- NILGIRIS DISTRICT

Sl. No.	Crops	Total Area (Hectare)	Percentage to Gross cropped Area
1	Tea	210.4	69.76
2	Coffee	63.8	21.15
3	Potato	9.4	3.12
4	Cabbage	4.7	1.56
5	Others	13.3	4.41
	Total	301.6	100.00

Note: Others include
Carrot, Cauliflower and Peas

of the selected farms.

The distribution of crops influences the requirement of different inputs including fungicides and again this is influenced by the factor whether they are irrigated or rainfed and hence the above discussion.

The details of cropping pattern relating to the Nilgiris is presented in Table -XVII. Tea occupied 69.76 percent of the gross cropped area followed by coffee with 21.5 percent. The other crops viz., potato, cabbage, carrot, cauliflower and peas constituted totally 9.09 percent of the cropped area. It indicates that the major fungicides requirement for the district would be for tea and coffee.

CROPWISE DISTRIBUTION OF SAMPLE FARMERS

It could be inferred from Table -XVIII that size of the farms and number of growers of paddy, irrigated groundnut, vegetables and grapes are positively related in Coimbatore district. In the Nilgiris, vegetable crops like potato, cabbage and carrot were not at all preferred by the marginal farmers and they went in for tea and coffee only while big farmers preferred tea and coffee mostly. The medium farmers almost equally

TABLE - XVIII

CROPWISE DISTRIBUTION OF SAMPLE FARMERS

Sl. No.	Crop	Marginal Farmers	Small Farmers	Medium Farmers	Big Farmers	Total Farmers
A	Coimbatore District					
1	Paddy	2 (4.6)	11 (25.6)	11 (25.6)	19 (44.2)	43 (100.0)
2	Groundnut-Irrigated	-	11 (23.9)	12 (26.1)	23 (50.0)	46 (100.0)
3	Groundnut-Rainfed	4 (9.5)	8 (19.1)	9 (21.4)	21 (50.0)	42 (100.0)
4	Sorghum	3 (10.0)	7 (23.3)	14 (46.7)	6 (20.0)	30 (100.0)
5	Maize	7 (50.0)	2 (14.3)	4 (28.6)	1 (7.1)	14 (100.0)
6	Onion	6 (40.0)	2 (13.3)	3 (20.0)	4 (26.7)	15 (100.0)
7	Vegetables	2 (5.9)	7 (20.6)	11 (32.3)	14 (41.2)	34 (100.0)
8	Grape	-	2 (25.0)	3 (37.5)	3 (37.5)	8 (100.0)
B	Nilgiris District					
1	Potato	-	5 (23.8)	12 (57.1)	4 (19.1)	21 (100.0)
2	Cabbage	-	3 (17.7)	10 (58.8)	4 (23.5)	17 (100.0)
3	Carrot	-	4 (25.0)	10 (62.5)	2 (12.5)	16 (100.0)
4	Tea	4 (11.4)	8 (22.9)	13 (37.1)	10 (28.6)	35 (100.0)
5	Coffee	5 (26.3)	3 (15.8)	3 (15.8)	8 (42.1)	19 (100.0)

Note : Figures in Parentheses indicate percentage to total number of growers.

distributed their lands among vegetables and tea in the Nilgiris.

2. FUNGICIDE USE PATTERN

Product planning for a new product requires a thorough knowledge on the use pattern of that product. The possibilities of entering into the market with the new product can be identified by studying the use pattern of a similar product in the market. So an attempt is made to analyse the fungicide use pattern of the user farmers and the results are predented in this section.

CROPWISE FUNGICIDE USE PATTERN

Details on cropwise fungicide use pattern of the sample farmers are furnished in Table -XIX.

Paddy

More than 90 percent of total paddy cultivators used fungicides in the study area. Among the marginal farmers only 50.0 percent used fungicides and it increased with the size of farm as 81.8 percent, 90.9 percent and 100.0 percent in the small, medium and big groups respectively. A maximum of two

rounds of fungicides was sprayed and 56.41 percent of the fungicide users had only one round of spray for their paddy crop.

Since sorghum and maize were grown under rainfed conditions they attracted little fungicides in the study area.

Groundnut

More than 90 percent of the groundnut (irrigated) growers used fungicides and one to three rounds of the same was used. The adoption rate increased with the size of the farm and on an average the farmers had two rounds of fungicides.

A lower level of adoption of fungicides was seen in case of rainfed groundnut growers and only one third of the farmers used fungicides and that too single round only. This is in confirmity with the results of previous studies* where in it is reported that none of the groundnut growers applied either insecticides or fungicides for rainfed groundnut.

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* N. Raveendaran, "An Appraisal of oilseeds production in Tamilnadu" Department of Agricultural Economics, Tamil Nadu Agricultural University, 1991.

Onion, Vegetables and Grapes

It is to be noted that cent percent of the onion and grapes growers and all the vegetable growers except marginal farmers applied fungicides. Only one round of fungicide spray was undertaken by 80 percent of the onion growers while it ranged from one to four rounds in the case of vegetables. Grapes is different in that 26 to 60 rounds were undertaken annually.

Thus the results of the present study confirms that farmers in Coimbatore district follows one to four rounds of fungicides for paddy, groundnut (irrigated), onion and vegetables and 26 to 60 rounds for grapes.

Nilgiris District

The fungicides use pattern of the selected farmers belonging to the Nilgiris is presented in Table -XIX. It could be noted from the table that hundred percent of potato, cabbage and carrot growers applied fungicides. Depending upon the crop growth and intensity of disease the number of rounds varied between three to eighteen for potato, one to four for cabbage and carrot.

In the case of plantation crops viz., tea and

TABLE - XIX

CROPWISE FUNGICIDES USE PATTERN OF USER FARMERS

Sl. No.	Crop	Users*	Number of Rounds Sprayed				Non Users *
			Minimum	Maximum	Mean	Mode**	
1	**Paddy**						
	Marginal Farmers	1 (50.0)	1	-	1	1 (1)	1 (50.0)
	Small Farmers	9 (81.8)	1	2	1.3	1 (5)	2 (18.2)
	Medium Farmers	10 (90.9)	1	2	1.5	1 (5)	1 (9.1)
	Big Farmers	19 (100.0)	1	2	1.5	1 (11)	-
	Total	39 (90.7)	1	3	1.46		4 (9.3)
2	**Sorghum**						
	Marginal Farmers	-	-	-	-	-	3 (100.0)
	Small Farmers	-	-	-	-	-	7 (100.0)
	Medium Farmers	-	-	-	-	-	14 (100.0)
	Big Farmers	-	-	-	-	-	6 (100.0)
	Total	-	-	-	-	-	30 (100.0)

(Continues)

Sl. No.	Crop	Users*	Number of Rounds Sprayed				Non Users*
			Minimum	Maximum	Mean	Mode**	
3	Maize						
	Marginal Farmers	-	-	-	-	-	7 (100.0)
	Small Farmers	-	-	-	-	-	2 (100.0)
	Medium Farmers	-	-	-	-	-	2 (100.0)
	Big Farmers	-	-	-	-	-	4 (100.0)
	Total	-	-	-	-	-	14 (100.0)
4	Groundnut-Irrigated						
	Marginal Farmers	-	-	-	-	-	-
	Small Farmers	9 (81.7)	1	3	1.6	1 (7)	2 (18.2)
	Medium Farmers	11 (91.7)	1	2	1.4	2 (7)	1 (8.3)
	Big Formers	22 (95.6)	1	3	1.5	1 (14)	1 (4.4)
	Total	42 (91.3)	1	3	1.5		4 (8.7)
5	Groundnut-Rainfed						
	Marginal Farmers	1 (25.0)	1	-	1	1 (1)	3 (75.0)
	Small Farmers	1 (12.5)	1	-	1	1 (1)	7 (87.5)
	Medium Farmers	3 (25.0)	1	-	1	1 (2)	6 (75.0)
	Big Farmers	9 (42.9)	1	2	1.1	1 (9)	12 (57.1)
	Total	14 (33.3)	1	-	1.1		28 (66.7)

Sl. No.	Crop	Users*	Number of Rounds Sprayed				Non Users*
			Minimum	Maximum	Mean	Mode**	
6	**Onion**						
	Marginal Farmers	6 (100.0)	1	-	1	1 (6)	-
	Small Farmers	2 (100.0)	1	1	1	1 (2)	-
	Medium Farmers	3 (100.0)	1	2	2	1 (2)	-
	Big Farmers	4 (100.0)	1	3	2	1 (2)	-
	Total	15 (100.0)	1	3	1.5		-
7	**Vegetables**						
	Marginal Farmers	-	-	-	-	-	2 (100.0)
	Small Farmers	7 (100.0)	1	4	1.9	3 (5)	-
	Medium Farmers	11 (100.0)	1	4	2.5	3 (6)	-
	Big Farmers	14 (100.0)	1	3	1.8	2 (8)	-
	Total	32 (94.1)	1	4	2.0		2 (5.9)
8	**Grapes**						
	Marginal Farmers	-	-	-	-	-	-
	Small Farmers	2 (100.0)	32	-	32	32 (2)	-
	Medium Farmers	3 (100.0)	34	60	50	34 (2)	-
	Big Farmers	3 (100.0)	26	42	34	26 (2)	-
	Total	8 (100.0)	1	60	39.6		-

(Continues)

Sl. No.	Crop	Users*	Number of Rounds Sprayed				Non Users*
			Minimum	Maximum	Mean	Mode**	
9	**Potato**						
	Marginal Farmers	-	-	-	-	-	-
	Small Farmers	5 (100.0)	5	12	8.8	12 (2)	-
	Medium Farmers	12 (100.0)	9	18	10.6	9 (3)	-
	Big Farmers	4 (100.0)	3	10	7.5	8 (2)	-
	Total	21 (100.0)	1	18	9.6		-
10	**Cabbage**						
	Marginal Farmers	-	-	-	-	-	-
	Small Farmers	3 (100.0)	1	3	2.7	2 (2)	-
	Medium Farmers	10 (100.0)	1	5	2.9	3 (5)	-
	Big Farmers	4 (100.0)	1	4	2.3	2 (2)	-
	Total	17 (100.0)	1	5	2.7		-
11	**Carrot**						
	Marginal Farmers	-	-	-	-	-	-
	Small Farmers	4 (100.0)	2	4	3	3 (2)	-
	Medium Farmers	10 (100.0)	1	4	2.8	2 (4)	-
	Big Farmers	2 (100.0)	2	-	2	2 (2)	-
	Total	16 (100.0)	1	6	2.8		

(Continues)

Sl. No.	Crop	Users*	Number of Rounds Sprayed				Non Users*
			Minimum	Maximum	Mean	Mode**	
12	Tea						
	Marginal Farmers	2 (50.0)	2	4	3		2 (50.0)
	Small Farmers	3 (37.5)	1	4	3	2 (2)	5 (62.5)
	Medium Farmers	10 (76.9)	2	18	6.1	6 (3)	3 (23.1)
	Big Farmers	10 (100.0)	2	12	6.5	8 (3	--
	Total	25 (75.8)	1	18	5.6		8 (24.2)
13	Coffee						
	Marginal Farmers	5 (100.0)	2	6	4.2	6(2)	-
	Small Farmers	3 (100.0)	3	4	3.7	4(2)	-
	Medium Farmers	3 (100.0)	4	5	4.7	5(2)	-
	Big Farmers	8 (100.0)	2	9	6.5	9 (2)	-
	Total	19 (100.00)	1	9	4.3		

Note:

* Figures in parentheses indicate percentage to the total number of users.

** Figures in parentheses indicate the number of times occured.

coffee variations in fungicide use are recorded. While 100 percent of the coffee planters used fungicide for two to nine rounds only 75.8 percent of the tea planters used one to 18 rounds with a mode of three rounds per annum. Maximum non-users were seen from marginal and small farm groups in case of tea.

The results of the study thus comfirms the use of fungicides by 100 percent of farmers in case of hill vegetables and coffee and by more than 75 percent of farmers relating to tea.

Quantity of Fungicide

The quantity of different fungicide used for various crops by the sample farmers during the year 1993-94 is represented through Table - XX.

Paddy

The table reveals that 33.3 percent of total user farmers used Hinosan, followed by Cuman L (28.2 percent), Kitazin (25.6 percent), Bavistin (17.9 percent), Kavach (15.4 percent) and Indofil M-45 (10.2 Percent). The brands Hinosan, Cuman-L, Bavistin and Kitazin were sprayed over 38.0, 21.0, 17.0

and 14.0 hectares respectively. But the area sprayed with Indofil M-45 and Kavach were very low ie.,7.0 and 3.0 percentages respectively.

Groundnut -Irrigated

Here Indofil M-45, Bavistin and kavach were used by 57.2 percent, 23.8 percent and 19.0 percent of the total user farmers respectively. About 59.0 percent, 25.0 percent and 16.0 percent of the groundnut irrigated area were sprayed with Indofil M-45, Bavistin and Kavach respectively. Eventhough Kavach was used by 19.0 percent of user farmers it had occupied only 16.0 percent of the total area sprayed with fungicides.

Groundnut Rainfed

It could be seen from the table that the same chemicals used for irrigated crop were also used for rainfed crop. But it contradicts from the irrigated crop with regard to area sprayed and quantity used. Out of the total area sprayed with fungicides Kavach was sprayed over 71.0 percent of the area followed by Bavistin and Indofil M-45 with 24.0 percent and 5.0 percent respectively.

Vegetables

The table reveals that 34.4 percent of user farmers used Indofil M-45 and Sulfex followed by Bavistin, Fytolan and Blitox with 18.8, 9.4 and 3.0 percents respectively. Out of the total fungicides sprayed area, 49 percent of area was sprayed with Indofil M-45 and Fytolan was sprayed over 4.7 percent of the area. The average quantity of all the fungicides used was higher than the recommended level. The disease complex and its intensity had more say over the price for such consumption level.

Grapes

This crop is highly sensitive to all type of diseases. More than one disease will be seen at a time. Such disease complex and the congenial atmosphere prevailing during the vegetative stage of the crop, forces the grape growers to use a variety of fungicides, at very frequent interval with varied levels of quantity, depending upon the incidence of diseasee and intensity of the disease. This may be the reason for the details seen in the table.

Potato

The table reveals that Indofil M-45 and Kavach were used predominatly with 52.4 and 33.3 percent respectively followed by Fytolan (14.3 percent) and Blue copper (9.5 percent). Out of the total sample area grown with potato, 53.0 percent of the area was sprayed with Indofil M-45 followed by kavach, Fytolan and Blue copper with 29.0 percent, 11.0 percent and 6.0 percent respectively. The reason may be that this crop is very much susceptible to Blight and Leaf spot diseases, which is further intensified by the congenial climatic conditions. Though the farmers applies the fungicide, which are all only contact in nature, it is washed out by the precipitation (snow, rainfall, dew etc.,). So the farmers have to use the fungicides after every rainfall. Because of this reason the level of consumption of fungicide was very high among the sample farmers for potato.

Cabbage

For Cabbage Indofil M-45 and Fytolan were used by majority of sample growers ie., 52.9 percent and 35.3 percent respectively, followed by Kavach with 11.2 percent of the sample growers. Similarly the area sprayed with also presents the same order ie., Indofil M-45, Fytolan and Kavach 55.10 percent, 32.7

percent, 12.2 percent of the area respectively.

Same trend holds good for carrot also. Due to the favourable climatic condition the level of fungicide use was high in these 2 crops. Since the farmers had started to use Kavach very recently (for the past 2 years) the farmers were reluctant to use the recommended quantity and the higher cost of the Kavach also contributed for such low level of consumption.

Tea

Karathane was used in a larger area of tea, viz., 40.0 percent of the gross sprayed area. Blue copper, Indofil M-45 and Nickle chloride were also used over a considerable area with 19.9 percent, 19.0 percent and 11.1 percent respectively, whereas kavach had a very little role ie., sprayed over 0.008 percent of the area only.

Coffee

The table reveals that though Bordeaux mixture was used by 73.7 percent and Kavach by 42.1 percent of the user farmers the area sprayed with these chemicals differs ie., Kavach was sprayed over 40.0 percent of the gross sprayed area and Bordeaux mixture over 37.0 percent of the area. Indofil M-45 and

TABLE - XX

ITITY OF FUNGICIDE USED BY THE USER FARMERS (In Kg/Lit per Hectare)

Sl No	Brand Name	Total No of Farmers	Total area sprayed (Ha)	Total Quantity Consumed (Lits/Kg)	Average Quantity Per Ha (Lits/Kg)
I	Paddy				
1	Bavistin	7 (17.8)	13.2 (24.7)	2.64	0.2
2	Cuman L	11 (28.21)	17.0 (21.0)	8.24	0.50
3	Hinosan	13 (33.3)	30.4 (38.0)	18.50	0.61
4	Indofil M-45	4 (10.3)	5.2 (7.0)	2.50	0.96
5	kavach	6 (15.4)	2.4 (3.0)	1.10	0.45
6	kitazin	10 (25.6)	12.0 (14.0)	7.00	0.58
II	Groundnut Irrigated				
1	Bavistin	10 (23.8)	15.2 (25.0)	2.22	0.50
2	Indofil M-45	24 (57.1)	37.0 (59.0)	38.0	0.81
3	Kavach	8 (19.1)	10.0 (16.0)	4.3	1.25
III	Groundnut Rainfed				
1	Bavistin	5 (35.7)	5.2 (24.0)	0.75	0.14
2	Indofil M-45	3 (21.4)	1.2 (5.0)	1.00	0.83
3	Kavach	6 (42.9)	15.7 (71.0)	8.75	0.56

(Continues)

Sl No	Brand Name	Total No of Farmers	Total area sprayed (Ha)	Total Quantity Consumed (Lits/Kg)	Average Quantity Per Ha (Lits/Kg)
IV	**Onion**				
1	Hinosan	1 (6.7)	1.2 (8.0)	1.0	0.83
2	Indofil M-45	8 (53.3)	7.2 (49.0)	4.80	0.67
3	Kavach	6 (40.0)	6.4 (43.0)	3.40	0.53
V	**Vegetables**				
1	Bavistin	6 (18.8)	1.8 (14.6)	0.80	0.44
2	Blitox	1 (3.1)	1.0 (8.1)	1.00	1.00
3	Fytolan	3 (9.3)	0.6 (4.7)	0.40	0.59
4	Indofil M-45	11 (34.4)	6.0 (49.0)	6.40	1.06
5	Sulfex	11 (34.4)	2.9 (23.6)	2.60	0.89
VI	**Grapes**				
1	Baleyton	1 (12.5)	1.6 (3.50)	2.40	1.50
2	Bordeaux Mixture	8 (100.0)	8.4 (19.0)	103.00	12.30
3	Indofil M-45	8 (100.0)	8.4 (19.0)	35.75	4.25
4	Karathane	8 (100.0)	8.4 (19.0)	10.00	1.20

(Continues)

Sl No	Brand Name	Total No of Farmers	Total area sprayed (Ha)	Total Quantity Consumed (Lits/Kg)	Average Quantity Per Ha (Lits/Kg)
5	Kavach	8 (100.0)	7.6 (17.0)	7.10	0.93
6	Ridomil	3 (37.5)	1.6 (3.5)	1.60	1.00
7	Rubicorn	8 (100.0)	8.4 (19.0)	9.70	1.15
VII	**Potato**				
1	Blue copper	2 (9.5)	0.8 (6.0)	2.50	3.13
2	Fytolan	3 (14.3)	1.4 (11.0)	5.80	4.14
3	Indofil M-45	11(52.4)	6.6 (53.0)	84.40	12.70
4	Kavach	7 (33.3)	3.6 (29.0)	43.50	12.08
VIII	**Cabbage**				
1	Fytolan	6 (35.3)	1.6 (32.7)	3.40	2.13
2	Indofil M-45	9 (52.9)	2.7 (55.1)	11.50	4.26
3	Kavach	2 (11.8)	0.6 (12.2)	0.50	8.30
IX	**Carrot**				
1	Blitox	1 (6.3)	0.2 (5.9)	0.40	2.00
2	Fytolan	5 (31.3)	0.9 (28.1)	3.40	3.78

(Continues)

Sl No	Brand Name	Total No of Farmers	Total area sprayed (Ha)	Total Quantity Consumed (Lits/Kg)	Average Quantity Per Ha (Lits/Kg)
3	Indofil M-45	8 (50.0)	1.5 (47.0)	3.80	2.53
4	Kavach	3 (18.8)	0.6 (19.0)	0.50	0.83
X	Tea				
1	Bordeaux Mixture	6 (24.0)	10.4 (3.0)	18.00	1.60
2	Blitox	9 (36.0)	24.2 (6.6)	30.44	1.26
3	Blue copper	7 (28.0)	72.8 (19.9)	98.00	1.35
4	Fytolan	1 (4.0)	3.0 (0.4)	2.00	0.67
5	Indofil M-45	2 (8.0)	68.8 (19.0)	84.80	1.20
6	Karathane	12 (48.0)	145.8 (40.0)	109.80	0.75
7	Kavach	1 (4.0)	0.6 (0.01)	0.80	1.33
8	Nickel Chloride	3 (12.0)	40.6 (11.1)	81.20	0.50
XI	Coffee				
1	Bordeaux Mixture	14 (73.7)	42.2 (37.0)	229.80	5.44
2	Fytolan	2 (10.5)	12.4 (11.0)	12.40	1.00
3	Indofil M-45	3 (15.8)	13.8 (12.0)	26.40	1.91
4	Kavach	8 (42.1)	46.8 (40.0)	44.20	0.94

Note : Figures in parentheses indicate percentage to the total.

Fytolan were also sprayed over 12.0 percent and 11.0 percent of the area respectively.

DECISIONS ON THE USE OF FUNGICIDES

The factors which unfluence the farmers to use fungicide and their relative influence are presented in the Table-XXI for Coimbatore and Nilgiris districts respectively.

Inspecting the disease symptoms and taking a decision was the major practice followed by more than 83 percent of farmers in both the districts. Using fungicide as a prophyaltic measure was the second major reason in Coimbatore district.

In Nilgiris district dealer's recommendation played the second major role while it had a little influence only in Coimbatore. Similarly the advice of contract person for sprayer was important while no such person could be identified in the Nilgiris.

Thus the results of the study indicated that a decision on use of fungicide was influenced mostly by the disease symptoms in both the districts while inter district variation

TABLE - XXI

DECISION MAKING BY USER - FARMERS TO USE FUNGICIDES

Sl. No	Decision making on the basis of	Marginal Farmers	Small Farmers	Medium Farmers	Big Farmers	Total Farmers
	A. Coimbatore District					
1	Inspecting the disease symptoms	3 (100.0)	13 (92.9)	17 (85.0)	29 (78.4)	62 (83.8)
2	As a prophylatic measure	2 (66.7)	3 (21.4)	5 (25.0)	6 (16.2)	16 (21.6)
3	Recommendation from contract person for sprayer	2 (66.7)	2 (14.3)	2 (10.0)	6 (16.2)	12 (16.2)
4	Plant growth stage	-	9 (64.3)	-	1 (2.7)	10 (13.5)
5	As a routine practice	1 (33.3)	-	1 (5.0)	1 (2.7)	3 (4.2)
6	Advise from the extension worker	3 (100.0)	-	-	1 (2.7)	4 (5.40)
7	Dealer's Recommendation	-	-	1 (5.0)	-	1 (1.4)

Note :

1. Figures in parentheses indicate the percentage to the total number of farmers in each category.
2. Since the respondents gave multiresponse the total of percentage will not be equal to 100.

Sl. No	Decision making on the basis of	Marginal Farmers	Small Farmers	Medium Farmers	Big Farmers	Total Farmers
	B. Nilgiris District					
1	Inspecting the disease symptoms	5 (83.3)	10 (83.3)	10 (71.4)	10 (100.0)	35 (83.3)
2	Dealer's Recomendation	-	1 (8.3)	6 (42.9)	1 (10.0)	8 (19.2)
3	As a prophylatic measure	-	3 (25.0)	-	1 (10.0)	4 (9.6)
4	As a routine practice	-	-	1 (7.1)	1 (10.0)	2 (4.8)
5	Farm Broadcast	-	-	1 (7.1)	-	1 (2.4)
6	Advise from the extension worker	1 (16.7)	-	-	-	1 (2.4)

Note :

1. Figures in parentheses indicate the percentage to the total number of farmers in each category.

2. Since the respondents gave multiresponse the total of percentage will not be equal to 100.

existed among other factors.

PRFERRENCE FOR A PARTICULAR BRAND

Knowing the supporting phenomena for prefering a product or brand by the consumer would enable to link the marketing with the consumer's satisfaction and to boost up the sale volume of the product. Hence an attempt has been made to analyse the reasons for prefering a particular brand of fungicides by the user farmers. Table - XXII represents the results.

In Coimbatore district the user farmers were preferring particular brand because of its good result realised in the past. It was followed in importance by the advice of the contract person for sprayer, dealer's recommendation, neighbour's advice, lower price and suitable pack size.

In Nilgiris district also first rank was assigned to the realisation of good results in the past and they were influenced by mass media advertisements in this district while the Coimbatore farmers were never bothered of the same. Suitable pack size and dealer's recommendation played a minor role in the brand preference of farmers in the Nilgiris.

TABLE - XXII

PREFERENCE FOR A PARTICULAR BRAND

Sl. No.	Reasons	Coimbatore Dt.		Nilgiris Dt.	
		Mean Score	Rank	Mean Score	Rank
1.	Good result realised	68.9	I	57.3	I
2.	As per the advice of the contract person for sprayer	62.3	II	-	-
3.	Dealer's Recommendation	54.8	III	40.3	IV
4.	Relative/Neighbour's advice	48.3	IV	-	-
5.	Lower price	48.3	IV	-	-
6.	Suitable pack size	42.1	VI	44.2	III
7.	Mass media advertisement	-	-	53.6	II
8.	Service rendered by the firm	-	-	37.6	V

DETERMINANTS OF QUANTITY OF FUNGICIDES

In Coimbator district the user farmers decided the quantity of fungicide on the basis of extent of damage, which was ranked first. It was followed by advice from the contract person for sprayer, area under particular crop, dealer's recommendation and plant growth.

In Nilgiris district also the extent of damage got the first rank followed by stage of the plant growth.

It could be seen from the study that in Coimbatore district the contract person for sprayer was the second major factor influencing the decisions of farmers on the use of fungicide, brand preference and quantity of fungicide use. Hence any educational / extension / sales promotion programme should cover the contract person for sprayer for better results.

USE PATTERN OF KAVACH

Kavach, being manufactured by Sandoz India Ltd., is the commercial product of the fungicide Chlorothalonil. Since kavach is the only commercial product of chlorothalonil in the market, it will be of much useful to know about the reactions of the farmers about Kavach. Hence an attempt was made in this respect and the results are presented in Table - XXIV and

TABLE - XXIII

DETERMINANTS OF QUANTITY OF FUNGICIDE

Sl.No.	Factors Determining the Quantity	Coimbatore Dt.		Nilgiris Dt.	
		Mean Score	Rank	Mean Score	Rank
1.	Extent of damage	63.4	I	55.2	I
2.	Advice from contract person for Sprayer	61.3	II	-	-
3.	Area under particular crop	54.3	III	48.2	III
4.	Dealer's recommendation	46.4	IV	48.2	III
5.	stages of plant growth	43.6	V	51.3	II
6.	Expiry Date of the chemical	34.3	VI	-	-
7.	Advice from Agricutural Department	-	-	40.1	V

discussed here under.

It could be seen from the table that in Coimbatore district only 39.2 percent of fungicide users had used Kavach. A large proportion, viz., 57.1 percent of the small farmers used Kavach while it was 33.3 percent, 40.0 percent and 32.4 percent in case of marginal, medium and big farmers respectively.

In the Nilgiris one third of the fungicide users had used Kavach. In this district most of the big farmers viz.,70.0 percent used this chemical followed by small, marginal and medium farmers with 33.3 percent, 16.7 percent and 14.3 percent respectively.

Dealers happened to be the major source of information with 67.4 percent for the users of Kavach followed by contract person for sparayer. Agricultural University and neighbour farmers played a limited role as source of information relating to Kavach constituting 11.6 percent and 2.4 percent of the total users.

TABLE-XXIV

USER AND NON-USER OF KAVACH

Sl. No.	Farmers	Users		Non-User	
		No	Percentage	No	Percentage
A.	**Coimbatore District**				
1.	Marginal	1	33.3	2	66.7
2.	Small	8	57.1	6	42.9
3.	Medium	8	40.0	12	60.0
4.	Big	12	32.4	25	67.6
	Sample	29	39.2	45	60.8
B.	**Nilgiris District**				
1.	Marginal	1	16.7	5	83.3
2.	Small	4	33.3	8	66.7
3.	Medium	2	14.3	12	85.7
4.	Big	7	70.0	3	30.0
	Sample	14	33.3	28	66.7

SOURSE OF INFORMATION FOR USERS OF KAVACH

	Number	Percentage
1. Dealers	29	67.4
2. Contract person for sprayer	8	18.6
3. Agricultural University	5	11.6
4. Neighbour farmers	1	2.4
Total	43	100.0

More than 83 percent of the kavach users had expressed their satisfaction over its performance ie., its ability to control the disease effectively and only 16.3 percent of users were not satisfied with it.

SATISFACTION WITH KAVACH

	Number	Percentage
Satisfied	36	83.7
Not Satisfied	7	16.3

Nearly 63 percent of the satisfied farmers expressed their willingness to use Kavach again due to its good

result and cost benefit. About one third of the satisfied Kavach users were not willing to use it again due to its higher price, side effect to the crop and non-availability in the market which were the first, second and third major problems with regard to the use of Kavach. Side effect was reported in case of kavach.

REASONS TO USE AGAIN

	Mean Score	Rank
1. Good result	77.8	I
2. Cost effective	52.6	II
3. Broad Spectrum	48.3	III

MAJOR PROBLEMS IN USING KAVACH

	Mean Score	Rank
1. Higher price	83.7	I
2. Side effect to the crop	70.5	II
3. Not easily available	68.2	III

Kavach was not used by 60.8 percent and 66.7 percent of the farmers in Coimbatore and Nilgiris districts respectively. The major reason for not using Kavach was that the farmers were not aware of kavach which attained the first rank.

REASONS FOR NOT USING KAVACH

	Mean Score	Rank
1. Not aware of Kavach	78.8	I
2. Higher price	69.3	II
3. Satisfied with presently using chemicals	57.2	III
4. Not available in the market	54.7	IV

Higher price of Kavach was found to be the second major reason for the non-users of Kavach.

The results of the study thus indicated the necessity of proper educational and advertisement programmes relating to chlorothalonil and also the need to reduce its price competitively.

FARMERS' PERCEPTION ABOUT MAJOR FUNGICIDES

Perception about various brands of fungicides is a major factor in deciding brand loyalty of farmers. By analysing

the perception of the farmers about the existing brands, the company could understand the needs and requirements of the farmers and channelise its efforts in developing and introducing the new products in the market. Hence an attempt was made to analyse the perception of the farmers about the major fungicides existing in the study area.

PERCEPTION ABOUT PACKING

All the farmers in both the districts agreed that the size of the pack was convenient with regard to all the major fungicides available except to Kitazine and Indofil M-45 in Coimbatore district and Karathane and Kavach in Nilgiris district. 4.55 percent and 10.00 percent of the farmers reported that they had no idea on Kitazin and Indofil M-45 respectively in Coimbatore district. On the other hand 14.3 percent of the farmers disagreed with the convenience of pack relating to Kavach in Nilgiris district as shown in Table XXV.

Perception About The Control Of Disease

Karathane, Blitox and Fytolan were rated to be the best ones among fungicides in Coimbatore district based on their

TABLE - XXV

SIZE OF THE PACK IS CONVENIENT

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	-	100.0	-	-	-	-	100.0	-	-	-
2.	Blitox	-	100.0	-	-	-	-	100.0	-	-	-
3.	Blue Copper	-	-	-	-	-	-	100.0	-	-	-
4.	Bordeaux Mixture	-	100.0	-	-	-	-	100.0	-	-	-
5.	Cuman L	-	100.0	-	-	-	-	-	-	-	-
6.	Fytolan	-	100.0	-	-	-	-	100.0	-	-	-
7.	Kitazin	-	90.0	10.0	-	-	-	-	-	-	-
8.	Hinosan	-	100.0	-	-	-	-	-	-	-	-
9.	Indofil M 45	4.55	90.9	4.55	-	-	-	100.0	-	-	-
10.	Karathane	-	100.0	-	-	-	-	90.9	9.1	-	-
11.	Kavach	6.9	93.1	-	-	-	-	85.7	-	14.3	-

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

TABLE - XXVI

CONTROL OF DISEASE IS GOOD

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	26.00	56.60	11.10	6.30	-	20.0	80.0	-	-	-
2.	Blitox	-	100.0	-	-	-	33.5	46.4	13.4	6.7	-
3.	Blue Copper	-	-	-	-	-	31.8	41.7	15.9	5.3	5.3
4.	Bordeaux Mixture	16.7	50.0	-	33.3	-	33.3	46.6	-	20.1	-
5.	Cuman L	23.5	64.7	-	5.9	5.9	-	-	-	-	-
6.	Fytolan	-	100.0	-	-	-	25.9	66.7	-	3.7	3.7
7.	Kitazin	20.0	60.0	-	20.0	-	-	-	-	-	-
8.	Hinosan	21.4	71.5	-	7.1	-	-	-	-	-	-
9.	Indofil M 45	9.1	83.4	-	4.6	2.9	16.7	73.4	-	6.6	3.3
10.	Karathane	25.0	75.0	-	-	-	22.5	53.5	-	13.5	4.5
11.	Kavach	10 .0	73.4	-	10.0	6.6	14.2	71.4	-	7.1	7.1

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

performance relating to control of diseases. Cent percent agreement on this aspect was seen with regard to Bavistin alone in Nilgiris district. Around 85 percent of Kavach users were satisfied with its performance in the districts as could be seen in Table XXVI.

Perception About The Price

Cent percent of the users in Coimbatore district and 86.7 percent in Nilgiris district accepted that the price was reasonable in case of Bordeaux mixture while 86 to 100 percent of user farmers were dissatisfied with that of Fytolan. Other fungicides were found to be costlier in the opinion of a large section of user-farmers in both the districts, the details of which are presented in the Table XXVII. More than 86 percent and 100 percent of farmers respectively in Coimbatore and Nilgiris districts were dissatisfied with the price of Kavach.

Perception About Availability In The Market

In Coimbatore district the availability in the market was perceived as easy for all the brands except for Kitazin, Kavach, Karathane and Cuman L with which 20.0 percent, 30.3 percent, 12.5 percent and 11.8 percent of user farmers respectively were not satisfied in relation to their availability

TABLE - XXVII

PRICE IS REASONABLE

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	-	74.0	7.5	18.5	-	-	-	-	87.5	12.5
2.	Blitox	-	-	-	100.0	-	-	-	6.7	79.9	13.4
3.	Blue Copper	-	-	-	-	-	-	36.8	10.5	47.4	5.3
4.	Bordeaux Mixture	-	100.0	-	-	-	-	86.7	13.3	-	-
5.	Cuman L	-	41.2	-	58.8	-	-	-	-	-	-
6.	Fytolan	-	-	-	100.0	-	-	-	11.1	74.1	14.8
7.	Kitazin	-	20.0	-	80.0	-	-	-	-	-	-
8.	Hinosan	-	33.3	-	66.7	-	-	-	-	-	-
9.	Indofil M 45	3.05	12.1	1.5	80.3	3.05	-	16.6	16.6	66.8	-
10.	Karathane	-	-	-	87.5	12.5	-	-	4.5	40.9	54.6
11.	Kavach	-	3.4	10.3	24.1	62.2	-	-	-	71.4	28.6

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

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TABLE - XXVIII

EASILY AVAILABLE IN THE MARKET

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	29.6	51.9	11.1	7.4	-	12.4	69.4	-	10.2	8.0
2.	Blitox	-	100.0	-	-	-	26.7	53.3	13.3	6.7	-
3.	Blue Copper	-	-	-	-	-	26.3	47.4	10.5	10.5	5.3
4.	Bordeaux Mixture	16.7	49.0	33.4	-	-	26.7	46.7	20.0	6.4	-
5.	Cuman L	11.8	58.8	11.8	11.8	5.9	-	-	-	-	-
6.	Fytolan	-	100.0	-	-	-	22.3	66.6	-	7.4	3.7
7.	Kitazin	10.0	70.0	-	20.0	-	-	-	-	-	-
8.	Minosan	-	86.7	-	13.3	-	-	-	-	-	-
9.	Indofil M 45	9.2	86.1	-	3.1	1.5	13.3	76.7	-	6.7	3.3
10.	Karathane	12.5	75.0	-	12.5	-	18.2	68.2	-	9.1	4.5
11.	Kavach	13.8	55.2	-	26.9	3.4	14.3	21.5	-	57.1	7.1

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

in the market.

In Nilgiris district 57.1 percent of the user farmers reported that the availability of kavach in the market was not easy. Baring the other minor level of response the user farmers perceived the availability of fungicides in the market as easy.

Perception About Easy To Apply

Except for Bavistin, Bordeaux mixture, Kitazin and Kavach in Coimbatore district and Bordeaux mixture, Fytolan and Kavach in Nilgiris district all other fungicides were reported to be easy to apply. The level of satisfaction varied from 80 to 100 percent and 71.4 to 93.3 percent in Coimbatore and Nilgiris districts respectively as shown in Table XXIX.

Regarding the safety to use, all the brands were perceived as safer fungicides by 79 to 100 percent of the user farmers. But they perceived that Blitox, Fytolan, Karthane and Kavach had side effect to the crops to some extent. Regarding the compatibility of the fungicides with other pesticides, except for Bavistin, Cuman L, Hinosan and Indofil M-45, majority of the farmers - almost hundred percent, reported their ignorance on the

TABLE - XXIX

EASY TO APPLY IN THE FIELD

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	14.8	66.7	-	18.5	-	17.0	72.0	-	11.0	-
2.	Blitox	-	100.0	-	-	-	20.0	60.0	20.0	-	-
3.	Blue Copper	-	-	-	-	-	31.6	58.0	-	5.2	5.2
4.	Bordeaux Mixture	-	66.7	-	33.3	-	-	80.0	-	13.3	6.7
5.	Cuman L	6.25	81.25	-	6.25	6.25	-	-	-	-	-
6.	Fytolan	-	100.0	-	-	-	18.5	63.0	-	18.5	-
7.	Kitazin	-	80.0	-	20.0	-	-	-	-	-	-
8.	Minosan	7.15	85.7	-	7.15	-	-	-	-	-	-
9.	Indofil M 45	7.6	80.3	-	9.1	-	16.7	76.6	-	6.7	-
10.	Karathane	25.0	75.0	-	-	-	18.2	68.0	-	9.2	4.6
11.	Kavach	13.8	69.0	-	17.2	-	-	71.4	-	21.4	7.2

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

TABLE - XXX

SAFETY TO USE

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	7.4	74.1	-	11.1	3.7	11.0	72.0	-	17.0	-
2.	Blitox	-	100.0	-	-	-	20.0	73.3	-	6.7	-
3.	Blue Copper	-	-	-	-	-	94.7	5.3	-	-	-
4.	Bordeaux Mixture	50.0	50.0	-	-	-	33.3	66.7	-	-	-
5.	Cuman L	23.6	70.5	-	5.9	-	-	-	-	-	-
6.	Fytolan	-	100.0	-	-	-	33.3	60.0	-	6.7	-
7.	Kitazin	10.0	80.0	-	10.0	-	-	-	-	-	-
8.	Hinosan	14.2	78.7	-	7.1	-	-	-	-	-	-
9.	Indofil M 45	9.1	83.4	-	4.5	-	16.7	74.0	-	6.7	3.3
10.	Karathane	25.0	62.5	-	12.5	-	18.2	72.8	-	4.5	4.5
11.	Kavach	6.7	72.4	6.7	10.3	6.7	14.3	78.6	-	7.1	-

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

TABLE - XXXI

THERE IS NO SIDE EFFECT

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	-	100.0	-	-	-	17.0	72.0	11.0	-	-
2.	Blitox	-	-	-	100.0	-	26.7	66.7	-	6.6	-
3.	Blue Copper	-	-	-	-	-	15.8	68.4	-	15.8	-
4.	Bordeaux Mixture	-	100.0	-	-	-	-	93.3	-	6.7	-
5.	Cuman L	-	58.8	41.2	-	-	-	-	-	-	-
6.	Fytolan	-	100.0	-	-	-	7.4	25.9	3.7	63.0	-
7.	Kitazin	20.0	40.0	10.0	30.0	-	-	-	-	-	-
8.	Hinosan	-	66.7	-	33.3	-	-	-	-	-	-
9.	Indofil M 45	-	75.8	24.2	-	-	16.7	83.3	-	-	-
10.	Karathane	12.5	62.5	-	25.0	-	12.5	9.1	45.5	18.2	27.2
11.	Kavach	-	69.0	-	31.0	-	-	83.3	-	16.7	-

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

TABLE - XXXII

COMPATIBLE WITH OTHER PESTICIDES

Sl. No	Brands	Coimbatore District					Nilgiris District				
		Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree	Strongly Agree	Agree	No idea	Dis agree	Strongly Disagree
1.	Bavistin	-	92.3	7.7	-	-	17.0	-	72.0	11.0	-
2.	Blitox	-	-	100.0	-	-	-	20.0	80.0	-	-
3.	Blue Copper	-	-	-	-	-	-	36.8	63.2	-	-
4.	Bordeaux Mixture	-	-	100.0	-	-	-	-	100.0	-	-
5.	Cuman L	-	82.4	17.6	-	-	-	-	-	-	-
6.	Fytolan	-	-	100.0	-	-	-	92.6	7.4	-	-
7.	Kitazin	-	-	100.0	-	-	-	-	-	-	-
8.	Minosan	-	93.3	6.7	-	-	-	-	-	-	-
9.	Indofil M 45	-	90.9	9.1	-	-	-	96.7	3.3	-	-
10.	Karathane	-	-	100.0	-	-	-	18.2	81.8	-	-
11.	Kavach	-	-	100.0	-	-	-	-	100.0	-	-

Note: Figures are in percentage to the total number of farmers who were used the concerned brand.

same. The details are furnished in the Tables XXX, XXXI and XXXII.

MARKET POTENTIAL FOR CHLOROTHALONIL

It is essential for a business firm to estimate the market potential because the knowledge of market potential allows the manufactures to allocate their resources in a better way in the marketing of inputs. An attempt was made to estimate the market potential for chlorothalonil for the periods 1995-96 and 1999-2000.

The market potential for fungicides may be categorised into two viz., total market potential and qualified market potential.

Total Market Potential

It is the maximum amount of units that may be available to all the firms in an industry during a given period and under the given environmental conditions.

Qualified Market Potential

It is the market potential based on the current use of the particular chemical in the field in the particular

crop segment. So it can be estimated for the tapped crop segment only. In the untapped crop segment the qulified market potential is zero. But by creating awareness among the farmers the untapped segment may also be penetrated in future years.

Since the agricultural system itself is highly complex in nature, certain specific assumptions are made to estimate the total market potential which are as follows;

1. Past trend will continue in the area under different crops in future also. Past relates to 1977-78 to 1992-93.

2. All the previous said chemicals could be competitive with each other in the market.

3. The present fungicide use pattern will continue in future also.

The Table - XXXII reveals that there exists a total market potential of about 427 to 570 tonnes for the year 1995-96 and about 537 to 717 tonnes for the year 1999-2000 in both the districts. Among the crops tea, coffee, paddy and groundnut have got a higher potential for chlorothalonil.

TABLE-XXXIII

TOTAL MARKET POTENTIAL FOR CHLOROTHALONIL

(In Kgs.)

Sl. No	Crops	In 1995-96		In 1999-2000	
		At 0.15 Percent	At 0.20 Percent	At 0.15 Percent	At 0.20 Percent
1.	Paddy	15493	20657	13182	17576
2.	Groundnut (Irrigated)	26778	35016	27444	35884
3.	Groundnut (Rainfed)	41440	54186	45933	60060
4.	Vegetables (Plain)	6444	8592	5660	7548
5.	Grapes	6240	8320	6040	8040
6.	Gingelly	1329	1772	1399	1866
7.	Sunflower	651	867	692	923
8.	Coffee	38120	50852	71076	94820
9.	Tea	255984	341616	332190	443316
10.	Potato	27610	39190	256000	36340
11.	Carrot	3204	4269	5034	6711
12.	Cabbage	3198	4266	3192	4254
	Total	426491	569603	53744	713338

TABLE XXXIV

QUALIFIED MARKET POTENTIAL FOR CHLOROTHALONIL (In Kgs.)

Sl. No	Crops	* Current level of adoption	In 1995-96 At 0.15 Percent	In 1995-96 At 0.20 Percent	In 1999-2000 At 0.15 Percent	In 1999-2000 At 0.20 Percent
1.	Paddy	90.7	14052.15	18735.90	11956.07	15941.43
2.	Groundnut (Irrigated)	91.3	24448.31	31969.61	25056.37	32762.10
3.	Groundnut (Rainfed)	33.3	13799.52	18043.94	15295.69	20000.00
4.	Vegetables (Plain)	94.1	6063.80	8085.07	5326.06	7102.67
5.	Grapes	100.0	6240.00	8320.00	6040.00	8040.00
6.	Coffee	100.0	38120.00	50852.00	71076.00	94820.00
7.	Tea	75.8	194035.87	258944.93	251800.02	336033.53
8.	Potato	100.0	27610.00	39190.00	50340.00	36340.00
9.	Carrot	100.0	3198.00	4269.00	5034.00	6711.00
10.	Cabbage	100.0	3204.00	4266.00	3190.00	4254.00
	Total		330771.65	442676.45	420376.19	562004.73

* In Percentage

But the Table - XXXIV reveals that the qualified market potential (based on current level of adoption for each crop) for chlorothalonil may be of about 331 to 443 tonnes for the year 1995-96 and about 420 to 562 tonnes for the year 1999-2000.

A wider gap is seen between the total market potential and qualified market potential in rainfed groundnut and tea. Also non-tapped crop segment viz., Gingelly and Sunflower is there which can be exploited by proper market penetration strategies.

ANALYSING THE PROMOTIONAL STRATEGIES OF COMPETITORS

Promotion is one of the four major variables in marketing and it is the mode of communication adopted by business community for acheiving the purpose of communicating, convincing and competing. A good product, an efficient channel and appropriate price are not enough by themselves. Communication and convincing elements should supplement to offer contrast to the efforts of competitors. It may be even stated that the competitive characteristics of promotion defines its vital role in the marketing strategy.

So an attempt was made to understand and analyse the promotional strategies adopted by the competitors, which would enable for positioning of the sponsoror's product. The results are discussed in this section.

Defining The Competitors

It was decided to consider only the firms which have significant share in the market as competitors and the promotional strategies adopted by them only were analysed and discussed. From the study, the following firms were identified as competitors in the market.

1. Indofil Chemicals
2. Imperial Chemical Industries
3. Sandoz (India) Ltd.
4. Rallis (India) Ltd.
5. Hindustan Ciba - Geigy
6. BASF
7. Bayer (India) Ltd.

General Discussion On The Competitors' Promotional Mix

The promotional mix for any product is heavily influenced by the company's push or pull strategies. In

Fungicides marketing also, these two strategies are adopted by the competitors. A push strategy calls for using the sales force to push the product through the channel. A pull strategy calls for spending a lot of money on advertising and consumer promotion to build up consumer demand. Hence the strategies are discussed under these headings.

Push Strategies

Normally push strategies include dealer meeting, discount pattern, commission structure, credit period, price system, personal selling and other short term incentives for dealers. The competitorwise push strategies are discussed below.

Indofil Chemicals

The Indofil chemicals, who is the market leader in fungicides in the selected districts, offers credit to the dealers for a maximum period of 15 days only. A two percent cash discount is also offered. At the same time 11 to 13 percent of margin on the sale price is allowed. Besides, it is adopting Quantity Rebate Scheme ie., Rs 20.00 is given for every 100 Kg of its product upto 900 Kg and Rs 425.00 is given for every 1000 Kg of its product. They have organised dealer meetings once in Coimbatore and Nilgiris districts during 1993-94. Normally orders

are booked once in a month. The company entered into the rate contract with the Department of Agriculture, Tamil Nadu. As per contract, the department personnels (A. A. O) have to sell a minimum of 20 Kgs of Indofil M-45 per head during the crop season.

Imperial Chemical Industries

ICI, the manufacture of Fytolan 50 Wp, provides a credit period of 15 days and offers 1.50 percent cash discount. The dealer will receive a margin of 6.5 percent for their product. They are using personal selling and booking orders once in a month. The company has conducted dealers meeting once in the Nilgiris district during 1993-94.

Sandoz (India) Ltd

Sandoz, the manufacturer of Kavach and Blue copper 50 Wp, provides a credit period of 15 days and a cash discount of 3.00 percent. The dealers are provided with special volume discount as follows:

For sales upto 100 Kgs - 1.50 Percent
Above 100 Kgs - 2.00 Percent

Rallis (India) Ltd

Rallis, the manufacture of Captofol, Blitox and Akozim provides a credit period of 15 days and offers 2.00 percent cash discount. The dealers are given with a margin of 8.5 percent. They are using personal selling method to a larger extent. The company has conducted dealers meeting once in Coimbatore district during 1993-94.

Hindustan Ciba- Geigy

Hindustan Ciba - Geicy, the manufacturer of Cuman L and Ridomil has conducted dealer meeting once during 1993-94 in Coimbatore district. The company provides credit for 30 days and cash discount of 3.00 percent. The dealer margin is 6.50 percent for their products. They are also using personal selling and booking the orders once in a month.

BASF

BASF, the manufacturer of Bavistin, allows the credit for 15 days. It gives a cash discount of 4.00 percent which is higher than the other competitors in the industry. The dealer will receive a margin of 6.50 percent.

Bayer (India) Ltd

Bayer, the manufactures of Hinosan, allows credit for 15 days. The cash discount provided by Bayer is 1.50 percent only. The dealers will normally receive a maximum of 6.50 percent margin.

Pull Strategies

While comparing with the fertilizer manufacturing firms, the adoption of pull strategies by pesticides firms is not upto the mark. The details of pull strategies adopted by the companies in the study area are discussed below.

Indofil Chemicals

Indofil chemicals company adopted the following pull strategies during 1993-94.

(a) Farmers contact programme to disseminate the message on Indofil M-45, use pattern and its performance.

(b) The important and successful strategy they followed was rate contract system which gained a lot to its awareness.

(c) Wall painting, release of leaflets, van compaign and radio advertisements are its other strategies.

Imperial Chemical Industries

Wall painting and release of leaflets were the major pull strategies adopted by ICI in the two districts studied.

Sandoz (India) Ltd

Sandoz adopted the following pull strategies in the study area :

Farmers contact programme, wall painting, distribution of leaflets about Kavach, advertisements in the local dailies during the season time for all its products and demonstration for Kavach in Coimbatore district for groundnut and grapes.

Rallis (India) Ltd

Rallis adopted Village adoption programme, Intensive crop programme, field demonstration, advertisements through Radio, T. V, News papers and sign boards in the study area.

Hindustan Ciba - Geigy

Hindustan Ciba - Geigy adopted all those of Rallis and additionally it screened films on its products.

On the other hand BASF and Bayer (India) Ltd followed only distribution of leaflets to the farmers.

DEALERS' RATING ON PROMOTIONAL ACTIVITES

The sample dealers were asked to rate the quality of the promotional activities followed by different firms by assigning ranks. Using Garett's ranking technique the companies were ranked for their promotional activities.

The results are furnished in Table XXXV. From the table- it could be seen that the field demonstrations of the Sandoz were ranked first followed by Rallis, Indofil Chemicals, Ciba, ICI, Bayer and BASF respectively. The advertisement of Indofil Chemicals were ranked first followed by Sandoz, Rallis, Ciba, ICI, Bayer and BASF. With regard to the services to the farmers Rallis was ranked first.

TABLE - XXXV

PROMOTIONAL STRATEGIES OF COMPETITORS-RANKED BY DEALERS

Sl No	Promotional Strategies	Indofil Chemicals	Sandoz	Rallis	Ciba Geigy	ICI	Bayer	BASF
A.	Pull Strategies							
1.	Demonstrations in farms	III	I	II	IV	V	VI	VII
2.	Attractive and Message oriented advertisements	I	II	III	IV	V	VI	VII
3.	Other Services to the farmers	II	III	I	IV	V	VI	VII
B.	Push Strategies:							
1.	Good Relationship with Dealers	I	II	III	IV	V	VI	VII
2.	Satisfactory margin	I	II	V	VI	IV	VII	III
3.	Attractive discount Scheme	III	V	VII	I	II	IV	V
4.	Sufficient credit period	IV	II	V	III	VI	VII	I

In push strategies the relationship of Indofil with dealers was ranked first followed by Sandoz, Rallis, Ciba, ICI, Bayer and BASF. Also the margin given by the Indofil was ranked first followed by Sandoz, BASF, ICI, Rallis, Ciba and Bayer. The discount scheme of Ciba geigy was ranked first followed by ICI, Indofil, Bayer, Sandoz, BASF and Rallis. BASF was ranked first for its credit period.

SUMMARY AND CONCLUSIONS

CHAPTER VI

SUMMARY AND CONCLUSION

The potential of fungicides in increasing the productivity of crops by protecting the crops from diseases necessitates the need for developing systemic fungicides which will be efficient to provide control measures. Market analysis for fungicides is important in developing appropriate fungicides, so that the new products shall be developed and positioned properly in the market; or the existing product shall be modified and repositioned.

Hence a study was taken to know the fungicide use pattern and the like aspects. The objectives of the study were

i) to study the use pattern of fungicides by the farmers

ii) to analyse the farmers' perception about the existing fungicides

iii) to assess the market potential for cholorothalonil

iv) to analyse the promotional strategies of the fungicide marketing firms in the selected area.

The study included paddy, groundnut, grapes, plain vegetables like chillies, brinjal and tomato, potato, carrot, cabbage, tea and coffee. Coimbatore and Nilgiris districts were selected as the study area. Totally 135 farmers ninety from

Coimbatore district and forty five from Nilgiris district were selected from nine blocks and 36 dealers were also selected using random sampling method. The major findings of the study are as follows:

The sample comprised of marginal, small, medium and big farmers. The total area operated varied form 0.40 ha to 27.00 ha with a mean of 4.39 ha. For the districts the mean area per farmer was 3.46 ha and 6.24 ha in Coimbatore and Nilgiris respectively.

More than 40 percent of the farmers were less than 45 years old and about 32 percent were more than 45 years old but less than 60 years old. Illiterates constituted about 20 percent of the sample in Coimbatore while they occupied nearly 40 percent in the Nilgiris.

Paddy, sorghum and groundnut were the major crops of Coimbatore district while tea and coffee were the major crops of the Nilgiris.

In Coimbatore district the size of the farm and number of growers of paddy, irrigated groundnut and vegetables were positively related. In the Nilgiris tea and

coffee were preferred by all size groups of farmers and the other crops had a little attraction.

Fungicides were used by 54.8 percent and 93.3 percent of farmers in Coimbatore and Nilgiris districts respectively and it was 85.9 percent for the study region as a whole.

In Coimbatore district more than 90.0 percent of the farmers were using fungicides for the crops viz., paddy, groundnut (Irrigated), onion, vegetables and grapes. Only one third of the farmers were using fungicides for rainfed groundnut. Since sorghum and maize were grown under rainfed conditions they attracted little fungicide in the study area. In grapes the number of sprays ranged from 26 to 60 rounds whereas in other crops the range was 1 to 4.

In Nilgiris district the fungicide use was cent percent for all the crops except for tea in which it was only 75.8 percent. The marginal and small farmers were very much reluctant to use fungicides for tea.

Indofil M-45 was the only brand used for all the crops in both the districts. The area sprayed with this brand was higher and it occupied nearly 50 percent of the total sprayed

area of all the crops except paddy and rainfed groundnut.

Kavach was used for all the crops except for tomato, brinjal and chillies. The gross area sprayed with Kavach was higher in rainfed groundnut, onion, coffee and potato and it occupied 71 percent, 43 percent, 40 percent and 29 percent of the gross sprayed area of these crops respectively. In tea Kavach was used a little and occupied only 0.008 percent of its gross sprayed area.

The results also revealed that Bordeaux mixture, Blue copper, Fytolan and Karathane were also used by a larger section of the farmers in the Nilgiris district.

In both the districts the extent of damage by the disease was the major and important factor to determine the quantity of fungicide to be used.

The realisation of good result from the fungicide was found to be the major factor for the preference of a particular brand by the farmers. Advice of the contract person for sprayer and dealer's recommendation were noted to be the second major factor in Coimbatore and Nilgiris districts respectively.

The result revealed that the current adoption level of Chlorothalonil is 39.2 percent and 33.3 percent in Coimbatore and the Nilgiris respectively.

More than 83 percent of Kavach users were satisfied over its performance. Nearly 63 percent of satisfied farmers were willing to use Kavach again due to its good result and cost effectiveness. About one third of the Kavach users were not willing to use it again due to its higher price, side effect to the crop and non-availability in the market. The two major reasons for not using Kavach by the non-users were reported to be the non awareness of the farmers about Kavach and its higher price.

The farmers had good perception about all the fungicides with regard to their packing size, easy for handling, and safety. They perceived that the price of all the fungicides except Bordeaux mixture, Blitox and Blue copper as not reasonable. They reported that Cuman-L, Hinosan and Indofil M-45 (In Coimbatore district) and Indofil M-45, Fytolan (In the Nilgiris) were compatible with other pesticides and they had no idea about other brands with respect to their comapatibility.

It has been estinmated that the total market

potential for chlorothalonil in 1995-96 as 427 to 570 metric tonnes and in 1999-2000 as 537 to 117 metric tonnes for both the districts. But the qualified market potential, based on the current level of adoption, may be 331 to 443 metric tonnes in 1995-96 and 420 to 562 metric tonnes in 1999-2000.

The firm has full potential in the non-trapped crop segment ie., gingelly and sunflower.

Regarding the promotional activities of the competitors - on pull strategies, the strategies of Indofil chemicals, Sandoz India Ltd., and Rallis India Ltd., were very much appreciated than those of Ciba Geigy, ICI, Bayer (India) Ltd., and BASF. On push strategies the Indofil chemicals, Sandoz India Ltd., Rallis India Ltd., and Ciba Gigy were appreciated very much. As a whole BASF was known only for its credit term and margin policies.

CONCLUSION

Periodical assessment of strength, weakness, opportunities and threats is essential regarding fungicides marketing. As the case firm M/s. Shaw Wallace & company Ltd., is operating in the field of agrochemicals over the long period it has good image in the field. It shall improve its market performance if it plan to overcome the weakness and threats. The

following strategies, developed based on the findings of this study would enable the case firm to overcome its pitfalls, it faces.

1. The company, has to have a better educational/extension programmes regarding cholorothalonil. Not only farmers but also the contract persons for sprayer (in Coimbatore district) are to be educated besides the dealers.

2. The major weakness of the existing fungicides is their price. It is suggested that the price of cholothalonil may be reduced competitively to improve its sale volume.

3. If the company is unable to offer its product, at lower rate than its competitors, it should find alternative strategies to convince the farmers. It shall position its products by focussing the cost effectiveness, which will create a new image for chlorothalonil.

4. Increasing the margin and discount rate for dealers will improve the sale of chlorothalonil besides the above.

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ANNEXURE

MARKET POTENTIAL FOR CHLOROTHALONIL UNDER DIFFERENT MARKET SHARES

Sl. No.	MARKET SHARE	MARKET POTENTIAL In 1995-1996		MARKET POTENTIAL In 1999-2000	
		At 0.15% (Recommended dose)	At 0.20%	At 0.15% (Recommended dose)	At 0.20%
1.	10 Per cent	42649.1	56960.3	53744.4	71333.8
2.	20 Per cent	85298.2	113920.6	107488.8	142667.6
3.	30 Per cent	127947.3	170880.9	161233.2	214001.4
4.	40 Per cent	160596.4	227841.2	214977.6	285335.2
5.	50 Per cent	213245.5	284801.5	268472.0	356669.0

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