MARKETING OF PLANTOZYME LIQUID BIOFERTILIZER IN PUNE DISTRICT

By

AMIT BABANRAO KANADE
(Reg. No. 98166)

A Thesis submitted to the

MAHATMA PHULE KRISHI VIDYAPEETH,
RAHURI-413722, DIST. AHMEDNAGAR,
(MAHARASHTRA).

In partial fulfilment of the requirements for the degree

of

MASTER OF SCIENCE (AGRICULTURE)

in

AGRI-BUSINESS MANAGEMENT

DEPARTMENT OF AGRICULTURAL ECONOMICS
(AGRI-BUSINESS MANAGEMENT)
POST GRADUATE INSTITUTE,
MAHATMA PHULE KRISHI VIDYAPEETH,
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Approved by

Dr. D.L.SALE
(Chairman and Research Guide)

Dr.D.V.KASAR
(Committee Member)

Dr. S.B.DANGAT
(Committee Member)

Dr. P.G.DESALE
(Committee Member)

Dr. B.H.KHAN
(Committee Member)

DEPARTMENT OF AGRICULTURAL ECONOMICS
POST GRADUATE INSTITUTE,
MAHATMA PHULE KRISHI VIDYAPEETH,
RAHURI - 413 722, DIST. AHMEDNAGAR (M.S.) INDIA

2000

CANDIDATE'S DECLARATION

I hereby declare that this thesis or part thereof

has not been submitted by me or any other

person to any other University or

Institute for a Degree

or Diploma.

Place : MPKV, Rahuri.
Dated : 17/ 7 /2000

Kanade AB
(A.B.KANADE)

Dr. D.L.Sale,
M.Sc.(Agri.), Ph.D.,
PG Diploma in Economic
Development and Planning (Italy),
Professor,
Department of Agril. Economics,
College of Agriculture,
Pune - 411 005,
Maharashtra, India.

CERTIFICATE

This is to certify that the thesis entitled **"Marketing of Plantozyme Liquid Biofertilizer in Pune District"**, submitted to the Faculty of Agriculture, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar (M.S.) in partial fulfilment of the requirement for the degree of **MASTER OF SCIENCE (AGRICULTURE)** in **AGRI-BUSINESS MANAGEMENT**, embodies the results of a piece of *bonafide* research work carried out by **Shri. A.B. KANADE**, under my guidance and supervision and that no part of the thesis has been submitted for any other Degree or Diploma.

The assistance and the help rendered during the course of this investigation have been duly acknowledged.

Place : MPKV, Rahuri.

Dated : 17/ 7 /2000

(**D. L. SALE**)
Research Guide

Dr. S.S. Kadam
Associate Dean,
Post Graduate Institute,
Mahatma Phule Krishi Vidyapeeth,
Rahuri - 413 722, Dist. Ahmednagar,
Maharashtra, India.

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Place : M.P.K.V., Rahuri.
Dated : 21 / 8 /2000

(S. S. Kadam)

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Place : MPKV, Rahuri

Dated : 17/7/2000.

Kanade AB..

(A. B. Kanade)

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ABSTRACT

MARKETING OF PLANTOZYME LIQUID BIOFERTILIZER IN PUNE DISTRICT

By

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AGRI-BUSINESS MANAGEMENT
MAHATMA PHULE KRISHI VIDYAPEETH, RAHURI 413 722
DISTRICT-AHMEDNAGAR
2000

Research Guide	:	Dr. D.L.Sale
Department	:	Agricultural Economics
Discipline	:	Agri-Business Management

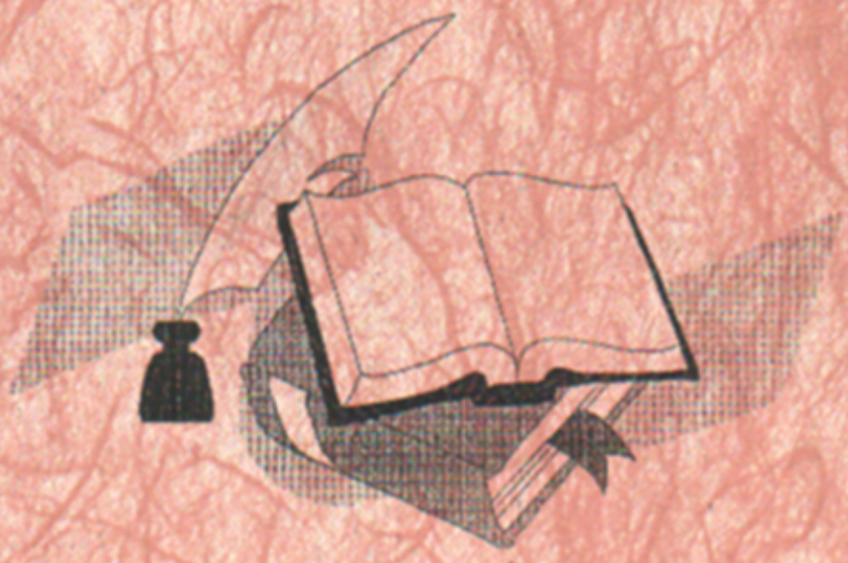
The present investigation was intended to depict the special picture of "Marketing of plantozyme liquid biofertilizer in Pune district". The study was undertaken in order to study use levels of liquid biofertilizer on sample farms in Pune district, to study various reasons for negligence to use it, to know about active competitors in market, and it's awareness.

In all, 100 farmers were selected from the four tahsils of Pune district namely; Baramati, Khed, Junnar and Ambegaon. For analysis simple arithmatic tools like frequency and percentages were used. For examining the relationship between dependent and independent variable, Chi-square test was used, The data were related to agricultural year 1999-2000.

During survey, it was found that about 32 farmers were aware about the liquid biofertilizers. Out of this, only nine farmers were aware about Plantozyme and using it, ll farmers were aware about the Biozyme

(Wockhardt) which is the main competitor of Plantozyme in Pune district. There are also other liquid biofertilizers in market as Masizyme, Superzyme, Cytozyme and however, their contribution is very less. Remaining 58 per cent were not using the product. 48 per cent of them were not aware about the product and remaining have not used it due to various reasons such as it develops physical disorders in plants, it is costly, several applications needed, etc.

The study therefore suggests that company should make extensive advertisement through local newspapers and road side hoardings . For reducing transportation cost company should accept group orders from the remote areas. The company should co-ordinate with Government schemes and co-operative societies to enhance it's sale. The quality of product should be improved so that farmers can get immediate results.



Introduction

1. INTRODUCTION

1.1 Importance of Biofertilizers

With almost twice the quantity of plant nutrients being removed from soil than what is added through fertilizers, the growing nutrient imbalance possesses a major threat to sustain soil health and crop productivity. The recent fall in fertilizer consumption due to unprecedented hike in the prices of P and K fertilizers has further aggravated the problem and has underlined the need for adoption of Integrated Nutrient Supply System (INSS) which involved the combined use of different nutrient sources such as chemical fertilizers, organic manure and biofertilizers.

Biofertilizers (BF) (microbial inoculants) are the products containing living cells of different types of micro-organisms which have an ability to mobilise nutritionally important elements from non usable to usable form through biological process. Although the advent of the phenomena is as old as a century, the need of its commercial exploitation was not felt in traditional agriculture. In recent years, biofertilizers have emerged as an important component of INSS and hold a promise to improve the crop yields and nutrient supplies. The role of legume inoculants in increasing nitrogen fixation and the yield of leguminous crops is well

known. A larger number of experiments conducted all over India have shown that the treatment of legume seeds with *Rhizobium* inoculants helps to increase the yield by 10-25 per cent on an average. The positive response has been obtained in almost all the pulse crops although not at all locations.

There is no difference of opinion about the usefulness and importance of biofertilizers in Indian agriculture. Considerable efforts particularly in last 15 years have also been made to promote the use of biofertilizers. However, the success has not been to the desired extent due to various constraints at production, marketing, distribution and field level.

Nonavailability of appropriate and efficient strains has been found to be one of the major constraints in widespread adoption of BF technology. Lack of suitable carrier, due to which shelf life is short, is another constraint. Peat is an ideal carrier material but it is not abundantly available in the country and lignite is only option left with the manufacturers.

Lack of qualified personnel engaged in the production, improper production facilities and lack of appropriate production techniques often results in poor quality inoculants. Poor inoculant quality is not only at production level but also due to poor transport, distribution and storage facilities. Inoculants which can be stored for six months at 20^0C, loose their effectiveness with a few hours at 40^0C or higher temperature.

Marketing of biofertilizers is not easy as the product contains living organisms. The demand for and production of biofertilizers is seasonal and as a result no established sale network exhibits except in a few cases. In general, there has been a lack of strong extension/education backup, sufficient publicity and advertisement programmes. Consequently a majority of farmers and extension workers are not aware about the potential of BF.

Besides these constraints, the past strategy of projecting BF as a substitute for fertilizers has done more harm than good. Due to such projections, farmers also expected same kind of response as that of fertilizers but they were disappointed with erratic and relatively low response which was also not visible during crop growth. It should also be noted that with a potential contribution of about 2 M.T. in terms of N input against the N requirement of over 12.5 M.T. by 2005, BF can neither replace nor bring significant reduction in fertilizer N consumption which is already at suboptimal level. They were however continued to play an important role in bringing the gap between nutrient demand and supply to some extent.

Having world's largest area under the crops where BF use has been quite beneficial, India has significant potential to promote BF technology. Present BF production at about 2200 tonnes is far below the potential demand. Concerted efforts right from working out realistic

demand, delineation of priority areas, development of suitable technology, Streamlining marketing and distribution arrangements, extension and training activities are needed to harness the potential of BF.

1.3 About Liquid Biofertilizers

Fertilizer is one of the important factors for the crops. Foliar fertilization has an increased role in crops nutrition but the years of research and development work are still needed. Foliar fertilization is of growing interest for both developing and developed nations. It has a big future especially if it gets still more reliable to apply and still more profitable. Foliar fertilization evidently activates the plant metabolism/assimilation thus contributing to overcome stress situations. It promotes root nutrient absorption.

Liquid biofertilizer is a biotechnological innovation from vegetable origin sea weed an algae. It basically and inherently contains the plant growth promoters like cytokinin, auxin precureson, enzymes and amino acid (leucin, alanin and glutanic acid).

The results revealed that its spray significantly recorded higher yield over non liquid biofertilizer application. It improves the N, P, K uptake by the crops, helps in better root and shoot development and resulted in

increased nutrient absorption and translocation which in turn resulted in higher yield.

1.3 The Problem

PRALSHAR BIOPRODUCTS PVT. Ltd. has introduced the liquid biofertilizers in the market i.e. plantozyme. Plantozyme plays a major role in plant growth.

Company has introduced its three products in market namely plantozyme granules, plantozyme liquid and Biocontrol *Trichoderma viridae*. Of these products, the company has assigned a study on plantozyme liquid biofertilizer.

The study namely "Marketing of Plantozyme Liquid Biofertilizer in Pune District" was undertaken with the following specific objectives.

1.4 Objectives of the study

i) To study the use levels of liquid biofertilizer on sample farms in Pune district.

ii) To study various reasons for non use of liquid biofertilizers

iii) To know active competitors in the market

iv) To know the level of awareness amongst the farmers about their soil problems and about product

v) To know about additions to the product if any and probable inputs of promotion mixture.

1.5 Scope and Utility of the study

The present study will be helpful to the policy makers of Pralshar Bioproducts Pvt. Ltd. in better understanding of marketing Plantozyme liquid biofertilizer in Pune district. The farmers can maximize their net profits by using proper dosage of biofertilizer and other allied practices, thus the study will be of practical utility. Similarly so far no such study has been carried out in Pune district by company and hence, it will be guideline for estimating useful parameter indicators from time to time.

1.6 Limitations of study

The study is subject to following limitations :

i) It has the usual limitations of one man research paper of which time and resources are most important constraints.

ii) The findings are based on the expressed opinion of the respondents and there was no way to know whether they are telling the whole truth.

iii) Some of the variables which were included in the questionnaire were not used in the analysis, because of the difficulty in getting information regarding some of the variables and also because of their lack of knowledge to provide relevant information for certain other variables.

1.7 Oraganization of Dissertation

The dissertation has been divided into 7 chapters. The first chapter deals with a brief introduction and objectives of the study, second chapter deals with the review of literature related to research problem. The third chapter is concerned with details of methodology used for conducting the research study. The fourth topic deals with description of area under study. The fifth chapter is devoted for results and discussion. The sixth chapter deals with summary, conclusion and suggestions. The literature cited, appendices and vita are given after the sixth chapter.

Review of Literature

2. REVIEW OF LITERATURE

Efforts have been made to quote reviews concerning to the present investigation by scanning the relevant literature. The research studies relating to marketing of fertilizers particularly biofertilizers have been referred and the relevant literature has been scanned.

Fertilizer is one of the important element in modern agricultural practices particularly in crop production. Therefore studies regarding its use, consumption, prices, marketing outlets etc., are of prime importance to agriculturists and researchers alike.

Considering the objectives, the review of literature related to the present investigation has been presented under following sections.

2.1 Marketing strategies

2.2 Constraints and limitations in marketing

2.3 Reasons for negligence to use fertilizers

2.4 Tendency of farmers towards using liquid fertilizers

2.1 Marketing strategies

Sunder Sham and Mutha (1994) stated that in the current situation of decontrol, there is considerable scope of production and marketing of biofertilizers as a cost effective and environment friendly source of plant nutrients. During 1991-92 Madras biofertilizers limited marketed

biofertilizers in Tamil Nadu and during 1992-93 extending marketing operations in Karnataka and Andhra Pradesh. The production of BF was initially confined to *Azospirilum* for rice, sugarcane, cotton, millets, *Rhizobium* for pulses. Phosphobacteria was introduced in May 1992 and *Rhizobium japonicum* from August 1992. Since introduction in 1991, 280 tonnes of various strains was produced.

MFL has over 5700 dealers in the southern region out of which 2000 acres in Tamil Nadu. Vijay BF is being marketed through this dealer network. In addition Vijay BF also marketed through institutional marketers, sugar factories and soya feed manufactures in Tamil Nadu.

MFL has 120 marketing officers and 30 market development officers for marketing and promotion of biofertilizers in the villages, for this MFL is implementing agro-service as well as agro information programmes. They also implemented long term agricultural developmental programmes (LTADP) and Integrated Rural Developmental Programme (IRDP).

Adkar and Dwivedi (1994) in their research paper published in Fertilizer news concluded that the constraints faced by the fertilizer industry are same as of other industries. There being lack of standardization of quality control procedures at the national level, lack of standardization of packing and doses of fertilizers, due to variation in above lot of fluctuations

in the unit price of BF produced by spurious manufacturers and the one produced by organized sector, lack of availability of adequate distribution, lack of popularity of BF as a commodity due to inadequate extension efforts by fellow manufacturers/State Government, lack of adequate and timely planning by state level machinery to project the realistic demand of BF and lack of adequate transport facilities.

Future strategies at NAFED aim basically in changing the overall appearance of BF industry from the conventional carrier based, short expiry products to products of international quality/potency with an increased longivity of atleast 12 to 18 months which can ensure steady demand from agri-input dealers/traders. As the problem of dumping unsold materials could be overcome on the one hand and financial loss to the manufacturers on account of expired/returned material are minimized, saving the overall national loss on the other hand. The immediate priority is to educate the farmers effectively to realise the potential of this promising biotechnology in order to reduce the use of chemical fertilizers and save valuable foreign exchange for country as a whole; yet meeting the challenges for increasing food production simultaneously.

Tilak and Gita Singh (1994) revealed that use of BF is restricted to certain crops and locations. There is a future scope to popularize these

biofertilizers by importing/strengthening transportation, distribution and storage infrastructure coastal regions may responded positively because of their moderate temperature regimes.

Low level of exchange at farmer level is because of slow nutrient release from biofertilizers. Dramatic yield increase obtained by mineral fertilizers applications are not seen in the case of biofertilizers. Dual or multiple inoculation with appropriate type (suitable) combination of bio-inoculants is likely to supply a number of nutrients. Selection of dizotrophs/strains depending upon their compatibility with crop cultivars is of vital importance to provide potentially beneficial BF to the consumers, strict quality control measures, efficient extension activity through demonstration and by creating awareness among farmers are the other requirements for full exploitation of biofertilizers.

Hazra (1994) stated that the prospect of increased forage production is enormous through the judicious use of BF as the forages are least fertilized crops and low in priority with regards to it's cultivation on high fertile soils. Use of non-symbiotic nitrogen fixers to grasses, *Rhizobium* to legumes and VAM to all perennial forages is worth considering as most of the fodder crops show a good response to biofertilization.

2.2 Constraints and Limitations in Marketing

Vladimir Ignatieff (1993), in his book 'efficient use of fertilizers' stated that many nutrient elements can be absorbed by the leaves of plants and this adoption is remarkably rapid and complete, as result some interest has been developed in the use of fertilizer sprays for supplying plants with major elements. However, there are some difficulties in applying as marginal leaf burn from over strong solution, low rates of nutrients applied in single application, high cost unit of plant nutrient, several applications were needed, there are advantages as convenience in handling and application, useful in areas with very high humidity, etc.

FAI (1986) in his book 'Biofertilizers in Indian Agriculture' classified constraints in BF use as production constraints, marketing constraints, resource constraints and field level constraints. In marketing constraints, the points included are as lack of awareness of farmers, inadequate and unexperienced staff, lack of quality assurance, seasonal and unassured demand, limited scope of marketing.

Ramaswami (1988) in his book 'A study of marketing of biofertilizers' opined that marketing is a fundamental business philosophy. It is, therefore, rightly said that marketing improvements and development should proceed production at planning stage. Judicious combination of

public, private and co-operative marketing enterprises is an ideal solution to the complex problems of marketing.

Subba Rao (1992) revealed that applied work relating to biofertilizers has been done in India on a large scale with legumes as well as non-legumes. In many instances the yield increases due to these BF may be marginal but poor country can ill afford to neglect any low cost input which can bring corresponding dividends to the farmers where labour is not as expensive as it is in advanced countries.

Magar (1992) in his study on "constraints in the fertilizer use for principal crops" concluded that the action of farmer in regard to the use of fertilizer was found to be associated with educational, technical knowledge, size of farm, irrigated area, availability of irrigation water, area under commercial crop and farm income and with this some policy implications are made by him as such, fertilizers should be made available to farmers at subsidized rate by the government. The village co-operative should ensure the availability of fertilizer to its farmer members during the period of crop season.

Hedge and Dwivedi (1994) suggested some strategies for future research and development in production technology for inoculants. There is a need to conduct field experiments, suitable recommendations should be

made to farmers, simple testing kit may have to be devised for farmers and extension workers. It is necessary to delineate the areas where biofertilizers could be effective and locations where different biofertilizers could be used must be identified, research is needed on soil physical and chemical factors that influence establishment of the inoculated strain in the rhizosphere and full expression of it's traits for benefiting the crop.

Katyal and Venketeswari (1994) in their paper reviewed that potential and limitations of biofertilizers in nutrient supplementation for dryland crops. Among the biofertilizers exhibited the greatest potential to augment N supply to legume pulses and oilseeds which predominate rainfed agriculture. Key factors contributing to inconsistence performance of BF in dry lands have been highlighted as longivity of cultures, timely availability of quality cultures, very low trials on farms, etc.

Mehta (1994) stated that fertilizer marketer has to function within the constraints of government policies on price , distribution margin, distribution pattern, etc. In such a situation profit has to come from proper budgeting and effective sales planning , proper analysis of sale and distribution costs as well as other marketing costs like, promotion, credit, warehousing, etc; are also important.

FAI (1994) in their publication given some points for extension and promotion of products which are as, prices of fertilizers, timeliness of availability, transportation facilities, warehousing facilities, credit facilities, (to distribution system to farmers), dealers profits, packaging and labelling arrangements, promotional programmes, supply of package of inputs.

Kute and Patil (1994) concluded that the increase in crop production by the use of biofertilizers over and above the chemical fertilizers indicate the improvement in fertilizer use efficiency. Gujarat states fertilizer company Ltd. is maintaining the high quality products standards as per the ISI specifications. GSFC has a strong R & D network and at present the experiments to increase the shelf life of biofertilizers and to find out the best suitable alternate carrier to lignite are under progress. Inspite of the fact, that the biofertilizers have played a vital role as a low cost agriculture input in increasing crop production, certain limitations and constraints particularly related to shelf life, high temperature, transportation and timely distribution in remote areas, etc., restrict the rapid growth of biofertilizer market, uniform price policy, standard packing and quality testing by Central/State Governments will help the manufacturer to develop healthy market in the country.

2.3 Reasons for negligence to use fertilizers

Sen (1981) studied some aspects of fertilizer use by small farmers. He found that the farmers operating marginal holding form the largest group of fertilizer users. The second largest group of fertilizer users was that of small farmers. The marginal farmers used largest quantity of fertilizers per unit of land and the small farmers, the second highest, while the quantity in case of other farmers was the lowest. If taken singly the share of marginal and small farmers in fertilizer consumption was the least as compared to large farmers. But by taking marginal and small farmers together their share in the total fertilizer consumption was larger than that of operators of large holdings.

Singh (1983) attempted to identify factors influencing fertilizer consumption in India in the past by using regression model. As indicated by the results the main factors influencing the fertilizer consumption were irrigation, area under high yielding variety crops and credit availability to the farmers. Rainfall and size of land holding do not show any significant effect on it.

Parthasarathy and Sinha (1986) studied the determinants of fertilizer use in Andhra Pradesh and they observed that the level of fertilizer use depended essentially upon two facts that is fertilizer product-price ratio

and particularly on productivity of fertilizers. The shift in response to the use of fertilizer caused by a number of factors, these include HYVS seeds, shifts in cropping pattern and increase in area under rabi season (The response to fertilizer use is expected to be higher in rabi). These may be said the shifters of demand for fertilizers. Besides these, fertilizer use may influenced by access to credit and also by the extent to which responses of fertilizers use are influenced by the location of cultivator, whether in high fertilizer using or low fertilizer using.

2.4 Tendency of farmers towards using liquid fertilizers

Geissler *et al.*, (1972) compared solid and liquid fertilizers for green house cucumber and reported that liquid manuring increases yield as compared with solid fertilizers.

Takolova and Yakolova (1976) reported that liquid compound fertilizers hastened the growth and development of tomato plants and advanced early yield upto 25 per cent when compared with plots treated with dry compound fertilizers.

Sergeva and Krovchenko (1990) with their trials to study the effect of liquid fertilizers on productivity of apple

revealed the following advantages of liquid fertilizers application as (1) 30 per cent labour saving compared with

conventionally fertilized plot, (2) completely mechanised form of application, (3) Increase yield and quantity.

Berad (1996) concluded that in recent years, liquid fertilizers are used as a strong alternative to solid fertilizers. The major advantage of liquid fertilizers is that they are completely soluble in water and can be applied through drip system with an ease, without any harm. It contains the major essential nutrients in rapidly available form it ultimately increases the fertilizer use efficiency by increasing the nutrient uptake and minimizing the loss.

Ghosh and Naik (1999) in their research paper published in fertilizer news revealed that Biozyme (Liquid biofertilizer) is a biotechnological innovation from vegetable origin-sea weed (*Ascophyllum nodusum),* an algae. It basically and inherently contains the plant growth promoters like cytokinin auxin, precureson, enzymes and amino acids (leucin, alanin and glutanic acid.). Suitably of biozyme has been tested in a few crops like capsicum but the information for groundnut is yet to be explored. Therefore a field experiment was conducted during summer season of 1996.

The results revealed that biozyme spray significantly recorded higher pod yield over non biozyme application. Biozyme and fertilizer

reaction was significant only for pod yield. Biozyme also improved N, P, K uptake by the groundnut. This indicates that the biozyme spray on groundnut helped in better root and shoot development and resulted in increased nutrient absorption and translocation, which in turn, resulted in higher yield. It's application gave 253 kg. more yield over it non application and increment. Cost : benefit ratio was 1 : 6.16.

Material and Methods

3. METHODOLOGY

Scientific study of any research problem requires an investigator to adopt appropriate methods, techniques, material and procedures in order to arrive at reliable, unbiased conclusions. In this chapter methodology of the problem is described with marketing research approach, indicating where and how the study was carried out in the sequence.

3.1 Method of sampling

Following procedure was adopted for sampling. sampling was done at two stages as -

a) Selecting tahsils and villages

b) Selecting respondents (interviewee) from the sampled villages.

3.1.1 Selection of tahsils

Criteria used while selecting the tahsils

i) Tahsils which grow all types of fruit crops grown in state.

ii) Representative of flowers and vegetable crops grown in state

iii) Representative of temperature, rainfall and cropping pattern.

Baramati, Khed, Junnar and Ambegaon tahsils were selected for the study in consultation with Mr. Satish R. Rukari, Somada Entreprises, distributor of plantozyme in Pune district.

Khed, Junnar and Ambegaon tahsils have a more area under potato, Khed tahsil has a more area under onion, Junnar tahsil is famous for the Banana and flowers. Ambegaon tahsil has more area under the groundnut, bajra, jowar, Baramati tahsil has a more area under the fruits and vegetable crops.

3.1.2 Selection of villages

From each of the selected tahsils two villages were selected randomly. The information relative to the list of villages along with the number of selected respondent farmers is given in Table 3.1.

3.1.3 Selection of respondents (interviewees) from the sample villages

The list of farmers in the selected villages was obtained from the taluka agricultural officer and circle agricultural officers in the concerned tahsils.

From the selected villages those respondents having cultivation of fruit and vegetable crops were selected randomly. Total hundred farmers constituted the sample for the study.

Table 3.1 : List of tahsilwise selected villages and the number of respondent farmers

Taluka	Village	No.of farmers
Baramati	Malegaon	13
	Sangvi	12
Khed	Khed	13
	Kadus	12
Ambegaon	Manchar	13
	Nirgudsar	12
Junnar	Junnar	13
	Narayangaon	12
Total :	-	100

3.2 Developing questionnaire

Questionnaire was prepared for obtaining the relevant data from the respondents by keeping the objectives of the study in mind. every care has been taken to frame questions, so that easy response could be obtained.

First part of the questionnaire deal with the selected personal and social characteristics, second part was constructed to study awareness about the product and third part was related with questions on adoptation level of the respondent farmers. Critical comments and suggestions were invited which helped in increasing the content and construct validity of questionnaire.

3.3 Pilot study

The questionnaire was pretested in villages other than those which were included in village in the sample, before putting it into actual use. At the time while presenting the schedule, purpose of the study was explained to the respondent farmers. Taking into consideration results of pretesting necessary modifications were made in construction and arrangement of questions to make the tool effective and valid.

3.4 Collection of data

In course of study, three methods were adopted :

i) Questionnaire

ii) Field visits and personal interviews

iii) Library.

Questionnaire/schedules were used to collect the information in order to fulfil the objectives of study. The respondents were contacted during their leisure time mostly and information was collected in the informal manner and discussion's were undertaken with these respondents. The scope, importance and significance of study was explained to the respondents for getting accurate valid and reliable information.

More information regarding product was taken from the area manager, distributor and company officials through personal interviews.

Books, journals, annual reports and other published literature were scanned from library.

3.5 Selection and measurement of the variables

The various variables selected for the purpose of study were according to the objectives of the study. Those were age, education, total land holding, annual income, inputs used, family members attached with society or organisation, cropwise use of plantozyme liquid biofertilizer in Pune district, comparison of competitors and product awareness, reasons for negligence to use of liquid biofertilizers, sources of information about the product, comparison between expenditure on fertilizer and on liquid biofertilizers.

3.6 Analysis of data

Due care was taken to check the data for it's accuracy after scrutinizing each response schedule was filled and a master chart was prepared in which all responses relating to variables were included. Therefore, relevant tables for the purpose of analysis were prepared and simple statistical techniques such as percentage and averages were used for analyzing the information and finding differences in the responses. The statistical tools and methods used for the present study for analysis of data were given as below.

3.6.1 Measurement of variables

For the measurement of variables the following statistical tools were used.

Frequency and percentage

Frequencies and then percentages were calculated for depicting simple comparisons. To calculate the percentage the frequency of particular category was multiplied by hundred and divided by total number of the respondent farmers.

Thus,

$$\text{Percentage} = \frac{\text{Frequency}}{\text{Total number of the respondent farmers}} \times 100$$

3.6.2 Relation between independent and dependent variables

It was also considered necessary to test statistical significance at some place and for this purpose χ^2 (chi-square) test was used using the formula at 95 % level of confidence :

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_I)^2}{E_I}$$

Where,

0_i = Observed frequency

E = Expected frequency

I = I^{th} cell in a table where there is a total of I = 1,2,3...D cells

E is calculated by the following equation -

$$E = \frac{RT \times CT}{N}$$

Where :-

E = Expected frequency

RT = The row total for the row containing the cell.

CT = The column total for the column containing the cell

N = The total number of observations.

Salient Features of the Study Area

4. SALIENT FEATURES OF STUDY AREA

This chapter is devoted to explain the background information of the study area, sample households and market. It is proposed to discuss in brief the physical features, land use and cropping pattern of district and tahsil, and socio-economic background of sample households together with salient features of selected markets under study in this chapter. The knowledge about physical features and economic background of the district would facilitate better understanding of the problem under investigation.

4.1 Location

Pune district comes under transitional zone and it is situated at an elevation of 558.53 metres above mean sea level. The district lies between 17^0 54' and 19^0 24' north latitude and 73^0 19' and 75^0 10' east longitude.

The district is bounded on the North and East by Ahmednagar district, South by Satara, West by Raighad, South East by Solapur and North-East by Thane district.

The total geographical area is 15,642 sq.km. which is 5 per cent of total geographical area of Maharashtra State. The total population was 41.04 lakhs, which was 7 per cent of total population of Maharashtra State according to 1991 Census.

4.2 Hill ranges

The main Sahyadri spreads over North-south in district. Some ranges spread to eastern side and some to the south-west side of district. The important ranges are Harichandra, Jeevan and Dhak Ahupe. The eastern part is comparatively plain and fertile. Western side of the district is hilly with dense forest.

4.3 Rivers

The Bhima is the major river of the district. Kukadi, Ghod, Indrayani, Mula, Mutha, Pavana, Neera and Karha are the important tributaries of Bhima river.

4.4 Soils

Pune district is occupied with black, red, and laterite soils. At the western side soil is red and light type but in eastern side it is of black and heavy type.

4.5 Climate

The climate of the district is hot during summer season. At the eastern side in Indapur, Daund and Baramati tahsils, it is more hot, while at the eastern side in the Maval and Mulshi tahsil, it is more cool.

Maximum temperature goes upto 37^0C during summer while minimum temperature is 13^0C in winter.

Average humidity is observed to be minimum at 76 per cent and maximum is 78 per cent.

4.6 Rainfall

Pune district receives rainfall mainly from the South-West monsoon but the distribution of rainfall is mostly uneven. As we move from west to east side rainfall gradually increases and at the eastern side it is hardly 50 mm.

The annual average rainfall of Pune district is 500-700 mm with long dry spell.

4.7 Population

The population of Pune district according to 1991 census was 41,64,470 out of that 53 per cent was urban population. The density of population was 266 per square kilometer and ranks fourth in Maharashtra State.

Average urban population in the Khed, Junnar and Baramati Talukas was 53000 according to 1991 census. Ambegaon has no urban population.

4.8 Transport

Pune district is connected by roads, rail and airways. The State Transport Bus Service is also well developed in most of the villages.

4.9 Land use pattern of Pune district

The information relating to the land use pattern is depicted in Table 4.1.

Table 4.1 : Land use pattern of Pune district

Land use pattern	Area (Lakh ha)	(Per cent)
Total geographical area	15.62	100
Area under forest	1.86	11.91
Land used for cultivation	1.53	9.80
Land under non agriculture	0.45	2.88
Permanent pastures and other pastures	0.95	60.81
Cultivable fallow land	0.39	2.50
Current	0.13	0.83
Other fallows	0.26	1.66
Net sown area	10.05	64.34
Double cropped area	1.61	10.31
Area under horticultural crops	0.67	4.29
Gross cropped area	11.61	74.33

Source : Socio-Economic Review and District Statistical Abstract of Pune District - 1995.

It is observed from the table that the total geographical area of the district is 1562000 hectares of which area under forest is 11.91 per cent.

Uncultivable land constitutes 9.8 per cent of the total geographical area while the proportion of cultivable wastes land is 2.50 per cent. The net area sown is 64.34 per cent of the total geographical area. While the area sown more than once is 10.31 per cent therefore the gross cropped area account for 115.52 per cent of the net area sown and 74.33 per cent of the total geographical area of the district.

4.10 Cropping Pattern of Pune district

The information relating to cropping pattern is given in Table 4.2.

Table 4.2 : Cropping pattern of Pune district for the year 1998-99

Sr.No.	Particulars	Pune District	
		Area (ha)	Percentage
1.	Paddy	630000	5.37
2.	Wheat	52400	4.47
3.	Jowar	50990	4.35
4.	Bajra	167624	14.30
5.	Other Cereals	29300	2.50
6.	Total Cereals	363400	31.00
7.	Total Pulses	40000	3.41
8.	Total Foodgrains	403400	34.41
9.	Sugarcane	344100	29.35
10.	Total Condiments & Spices	5800	0.49
11.	Total Vegetables	58600	5.01
12.	Total Fruits	27900	2.38
13.	Total Flowers	600	0.05
14.	Total Oilseeds	53200	4.55
15.	Fibres	500	0.04
16.	Forage & Fodder Crops	278100	23.72
17.	Total Non Food Crops	770800	65.75
18.	Cross Cropped Area	1172200	100.00

It is found that cereals were mainly grown by sample growers which constituted 31 per cent of the gross cropped area. Total pulses accounted 3.41 per cent thus total foodgrains occupied 34.41 per cent of the gross cropped area. The area under the sugarcane crop was 21.30 per cent of gross cropped area. The area under fodder and forage crops was 23.72 per cent and the area under total vegetables was 5.01 per cent of the gross cropped area. The gross cropped area in the year 1998-99 was 1172200 hectares.

Results and Discussions

5. RESULTS AND DISCUSSION

Keeping in view the objectives of study results are presented and discussed under following headings.

5.1 To study the use levels of liquid biofertilizer

5.1.1 Education

5.1.2 Age

5.1.3 Total land holding

5.1.4 Annual income

5.1.5 Inputs used

5.1.6 Family members attached with society or organization

5.1.7 Comparison between expenditure on fertilizer and on liquid biofertilizer

5.2 Reasons for negligence to use liquid biofertilzers

5.3 Comparison of competitors and product awareness

5.4 Level of awareness amongst the farmers about their soil problems and about product

5.4.1 Sources from where farmers know about product

5.4.2 Soil problem awareness

5.5 To know about additions to the product if any and probable inputs of promotion mixture

In the survey of 100 farmers from four tahsils following parameters were tested such as education level, age, total land holding and annual income.

5.1.1 Education level

It was seen in survey that mostly educated farmers were using the liquid biofertilizers. Classification of the education level of the surveyed farmers is depicted in Table 5.1.

Table 5.1 : Education level of farmers

Sr.No.	Class	Percentage
1.	Uneducated	10
2.	Primary	45
3.	Secondary	30
4.	Higher secondary	10
5.	Graduate and above	5

Table 5.2 : Relationship between education level of farmer and adoption of liquid biofertilizer

	Adopters	Non adopters	Total
Uneducated	2	8	10
Primary	9	36	45
Secondary	12	18	30
Higher Secondary	6	4	10
Graduate and above	3	2	5
Total	32	68	100

1. Calculated χ^2 value = 10.192
2. D.F. = 4
3. Table value = 9.49
4. χ^2 value is greater than χ^2 table value
5. There is a significant correlation between education and adoption.

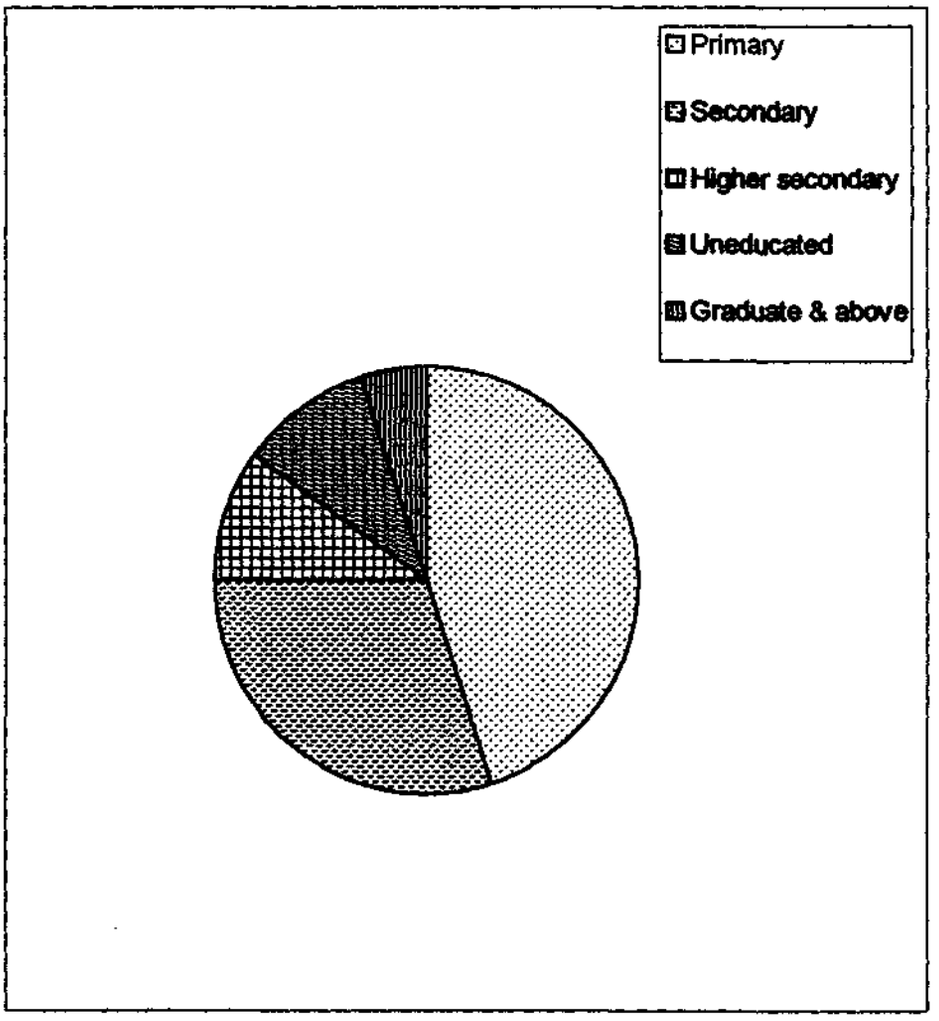
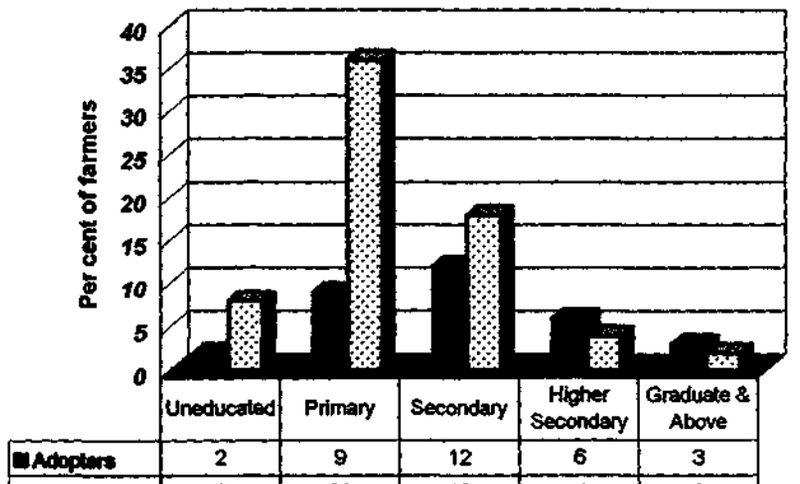


Fig 1 : Education level of farmers

Fig - 2 : Relationship between education level and adoption of Liquid biofertilizers



5.1.2 Age

It was observed during the survey of farmers that 56 per cent of the respondents were of above 41 years followed by 32 per cent between age of 31 to 40 years and 12 per cent below 30 years. The information relating to distribution of respondent farmers according to age is given in Table 5.3. While the details regarding relationship between age and adoption of liquid biofertilizer are given in Table 5.4.

Table 5.3 : Age distribution of farmers

Sr.No.	Age (Years)	Percentage
i)	Below 30	13
ii)	31 to 40	33
iii)	above 41	54

Table 5.4 : Relationship between age and adoption of liquid biofertilizer

Age (years)	Adopter	Non-adopter	Total
Below 30	6	7	13
31 - 40	14	19	33
Above all	12	42	54
	32	68	100

calculated χ^2 value = 5.214

Table value of χ^2 at 2 DF = 5.999

χ^2 value < table χ^2 value Therefore there is no significant correlation between age and adoption of liquid biofertilizer.

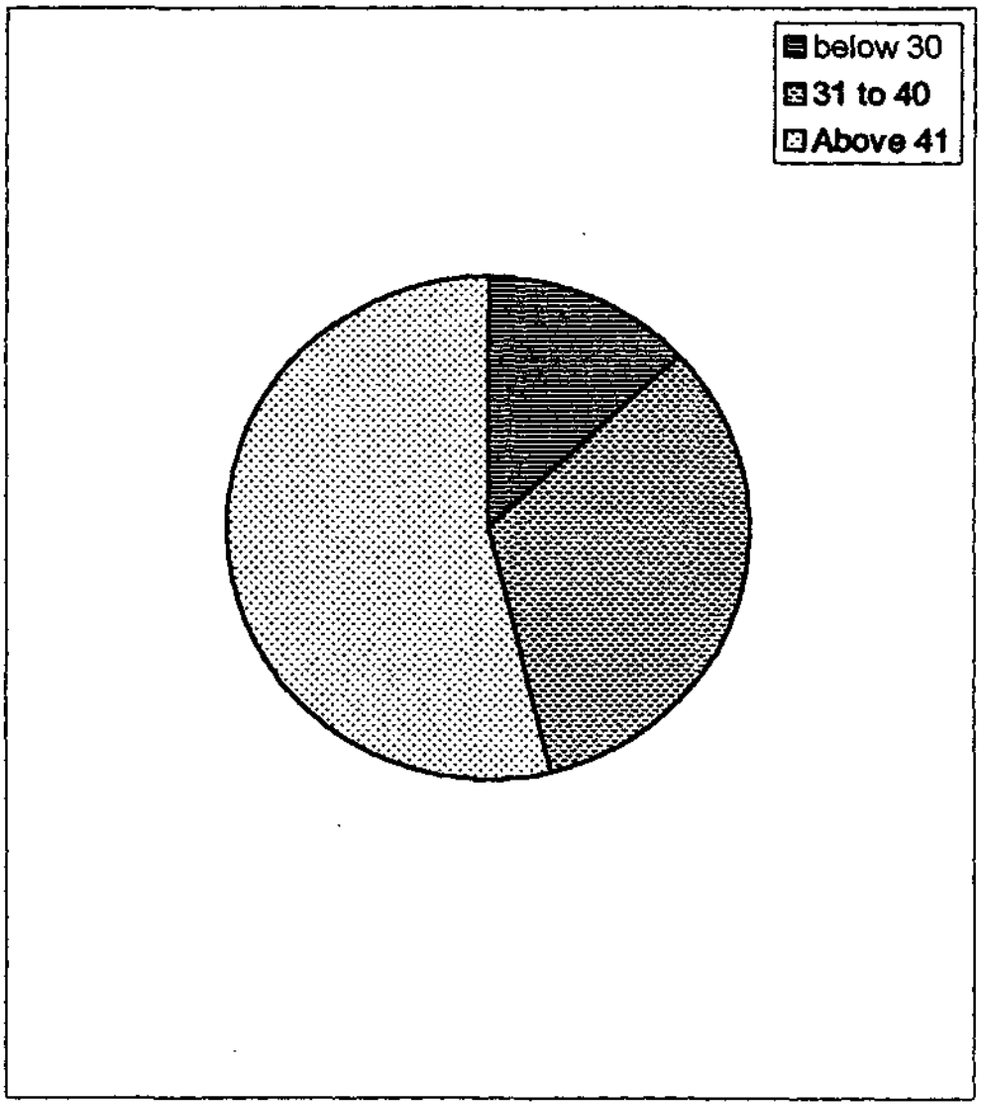
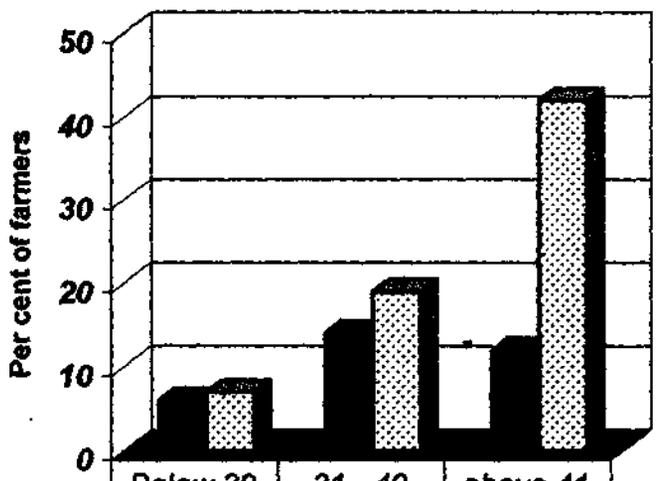


Fig 3 : Age distribution of farmers

Fig 4 : Relationship between age and adoption of Liquid biofertilizer



	Below 30	31 - 40	above 41
Adopter	6	14	12
Nonadopter	7	19	42

Age (Years)

5.1.3 Total land holding

It was seen during the survey that the total land holding is even or distributed equally. Average land holding of the farmers who found to be in the range of 4 to 8 hectares.

Liquid biofertilizers were mostly used by the farmers having more land holding. Although these farmers do not use it on whole area but used it on limited area and mostly on fruit crops and vegetables.

Classification of total land holding of the surveyed farmers according to the total land holding is depicted in Table 5.5. The picture relating to relationship between land holding and adoption of liquid biofertilizer is depicted in Table 5.6.

Table 5.5 : Total land holding

Sr.No.	Total land holding (ha)	Percentage respondents
1.	Less than 4	44
2.	4 - 8	36
3.	8 - 16	14
4.	16 -24	4
5.	Above 24	2

Table 5.6 : Relationship between Total land holding and adoption of liquid biofertilizer

Land holding (ha)	Adopter	Non-adopter	Total
Less than 4	13	31	44
4 - 8	9	27	36
8 - 16	8	6	14
16 - 24	1	3	4
Above 24	1	1	2
Total	32	68	100

Calculated χ^2 = 6.822

Table value of χ^2 at G.D.F. = 9.49

Cal χ^2 < Table χ^2

Non-significant

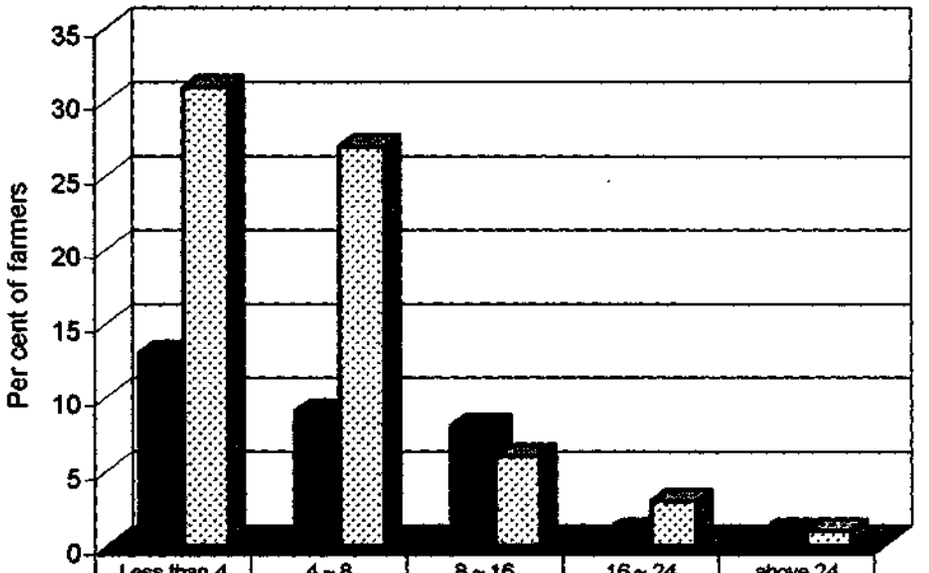
There is no significant correlation between land holding and adoption of liquid biofertilizer.

5.1.4 Annual Income

Out of the hundred farmers surveyed 57 per cent of the farmers having annual income upto Rs. 50,000/- and 21 per cent of the farmers having income annual income from Rs. 0.50 lakh to Rs.1 lakh.

It was seen that the liquid biofertilizers was used only by the high income farmers.

Fig - 6 : Relationship between total land holding and adoption of liquid biofertilizer



	Less than 4	4 ~ 8	8 ~ 16	16 ~ 24	above 24
Adopter	13	9	8	1	1
Nonadopter	31	27	6	3	1

Total land holding

Classification of farmers according to different income levels is given in Table 5.7.

Table 5.7 : Annual income distribution.

Sr. No.	Income (Rs. lakh)	Percentage
1.	Less than 0.50	57
2.	0.50 - 1	21
3.	1 - 1.50	9
4.	1.50 - 2	7
5.	2 - 2.50	4
6.	2.50 onwards	2

Table 5.8 : Relationship between annual income and adoption of liquid biofertilizer

Income (Rs.lakh)	Adopter	Non Adopter	Total
Less than 0.50	8	49	57
0.5 to 1	10	11	21
above 1	14	8	22
Total	32	68	100

Calculated χ^2 = 20.916

Table value of χ^2 at 2 DC = 9.21

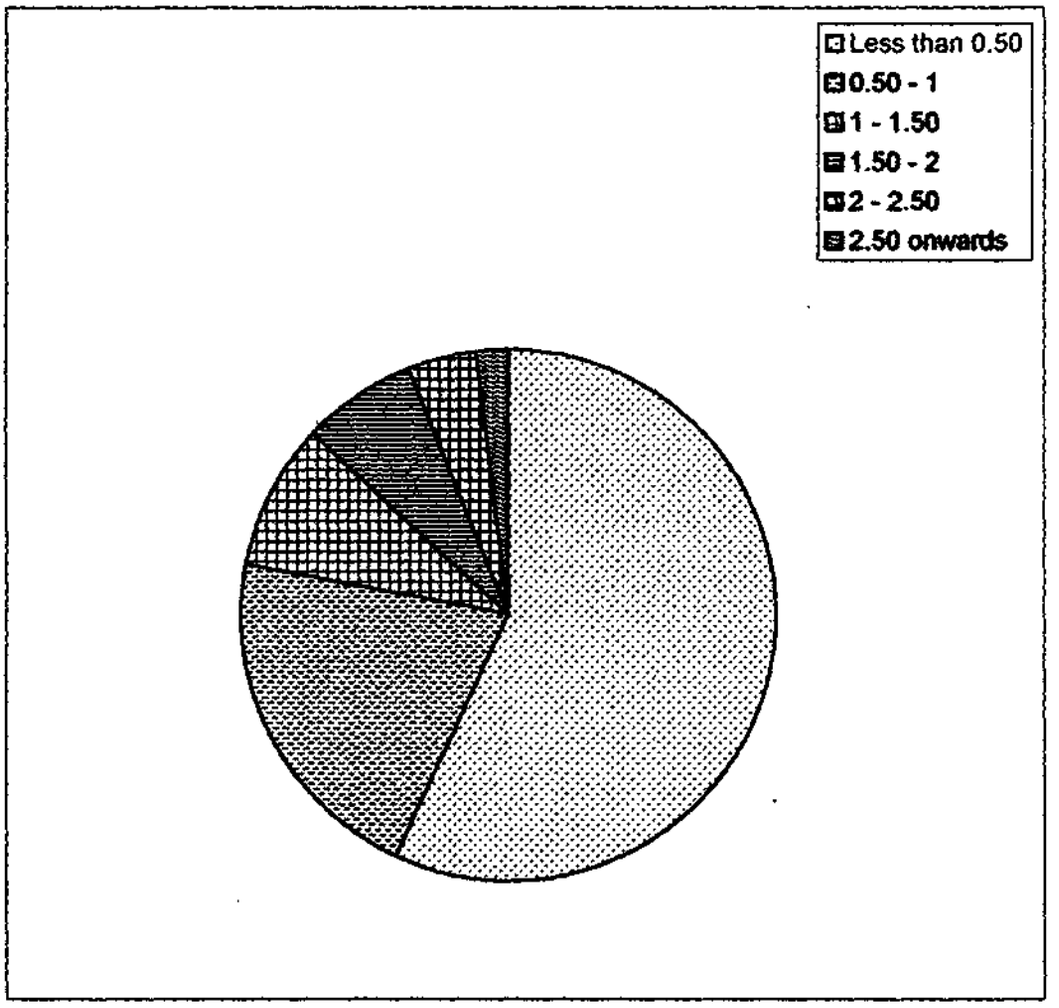
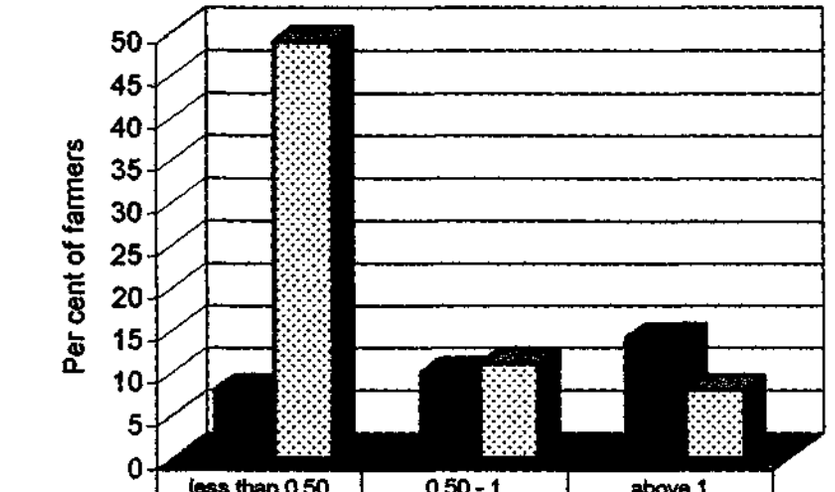


Fig 7 : Annual income distribution

Fig - 8 : Relationship between annual income and adoption of Liquid biofertilizer



	less than 0.50	0.50 - 1	above 1
Adopter	8	10	14
Nonadopter	49	11	8

Annual Income (Rs. lakh)

Significant at 0.01 level of probably.

There is significant correlation between annual income and adoption of liquid biofertilizer.

5.1.5 Input used

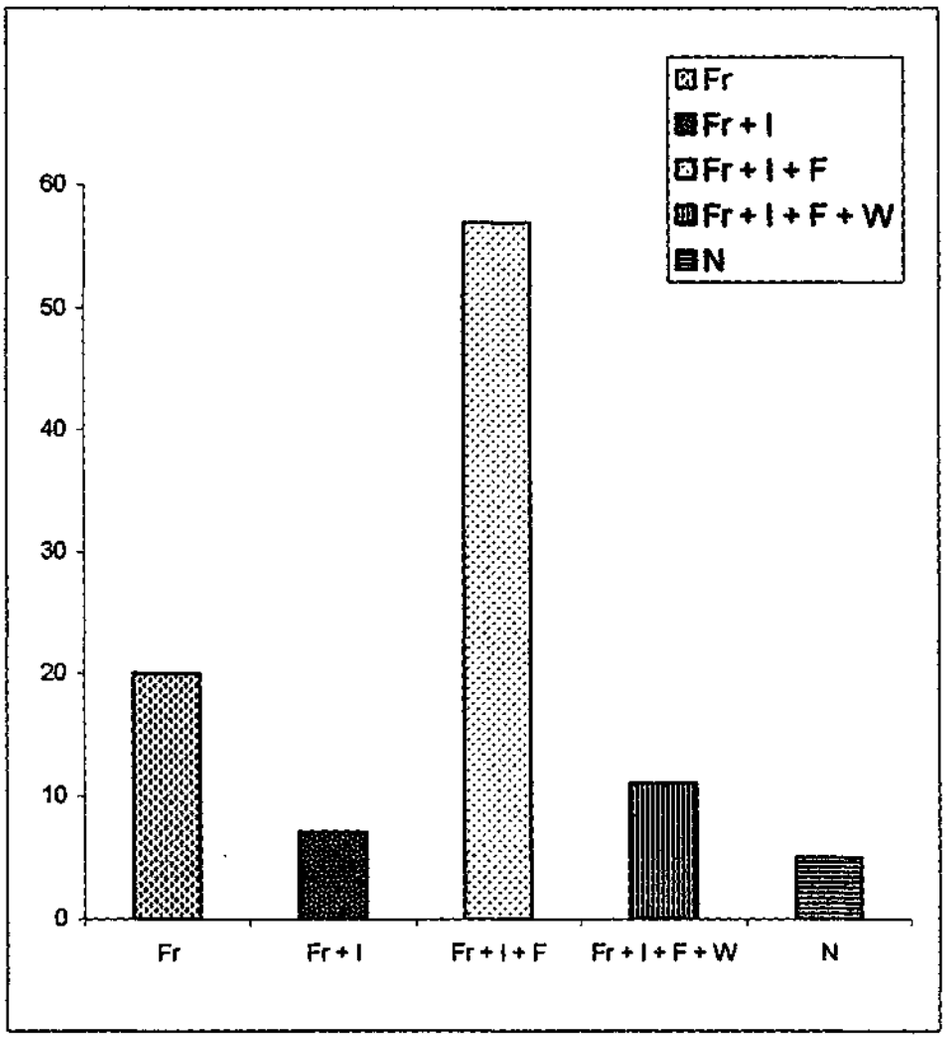
It is found that 5 per cent of the surveyed farmers did not use any agricultural inputs like insecticides, weedicides and fertilizers.

95 per cent farmers were using fertilizers, out of this 20 per cent using only organic fertilizers, 25 per cent using only inorganic fertilizers and 55 per cent were using both.

The information relating to classification of farmers having different input used is given in Table 5.9.

Table 5.9 : Inputs used by farmers

Sr.No.	Inputs used	Percentage
1.	Using only fertilizers	20
2.	Using Insecticides + fertilizers	7
3.	Using Insecticides + fertilizer + fungicide	57
4.	Using Insecticide + fertilizers + fungicide + weedicide	11
5.	Not using any inputs	5



Fr - Fertilizers, F - Fungicide, I - Insecticides,
W - Weedicides, N - Not using any inputs

Fig 9 : Inputs used by farmers

5.1.6 Family members attached with society/organization

During the survey, farmers attachment with any society was tested. It was seen that 40 per cent of the surveyed farmers were not attached to any society. Large number of farmers were members of milk society and very few were members of grampanchayat, co-operative societies, sugar factories. Classification of the respondent farmers according to their attachment with society/organization is given in Table 5.10.

Table 5.10 : Family members attached with society/organization

Sr.No.	Societies/Organization	Percentage
1.	Not attached with any society	40
2.	Grampanchayat	5
3.	Co-operative societies	7
4.	Milk societies	27
5.	Sugar factory	10
6.	Co-operative society + sugar factory	4
7.	Milk society + Grampanchayat	7

5.1.7 Comparison between expenditure on fertilizers and on liquid biofertilizers.

In the survey of hundred farmers level of expenditure on fertilizers and the level of expenditure on liquid biofertilizers was tested, the same information is given in Table 5.11.

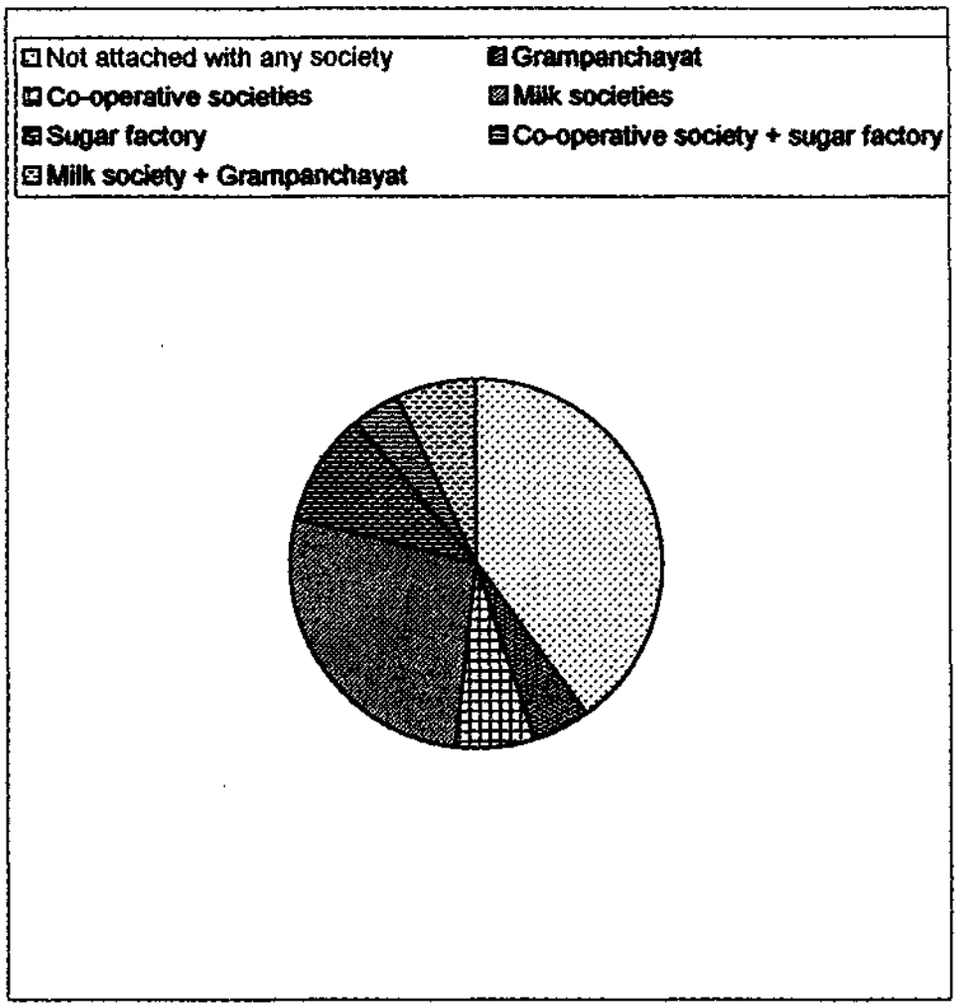


Fig 10 : Family members attached with society

Table 5.11 : Comparison between expenditure on fertilizers and on liquid biofertilizer.

Sr.No.	Expenditure on fertilizers. (Rs.)	Percentage
1.	None	5
2.	1000 - 5000	16
3.	5000 - 15000	34
4.	1500 - 25000	25
5.	25000 - 4000	11
6.	above 40000	9

Sr.No.	Expenditure on liquid biofertilizers. (Rs.)	Percentage
1.	None	68
2.	100 - 500	4
3.	500 - 1000	11
4.	1000 - 1500	8
5.	1500 - 2000	5
6.	above 2000	4

It is observed from Table 5.11 that the expenditure on liquid biofertilizers was quite low as compared to the expenditure incurred on fertilizers. Similarly, 68 per cent farmers were not doing any expenditure on biofertilizers while the corresponding figure was only five in case of fertilizers. The magnitudes of expenditure on fertilizers was higher in case of almost all respondents.

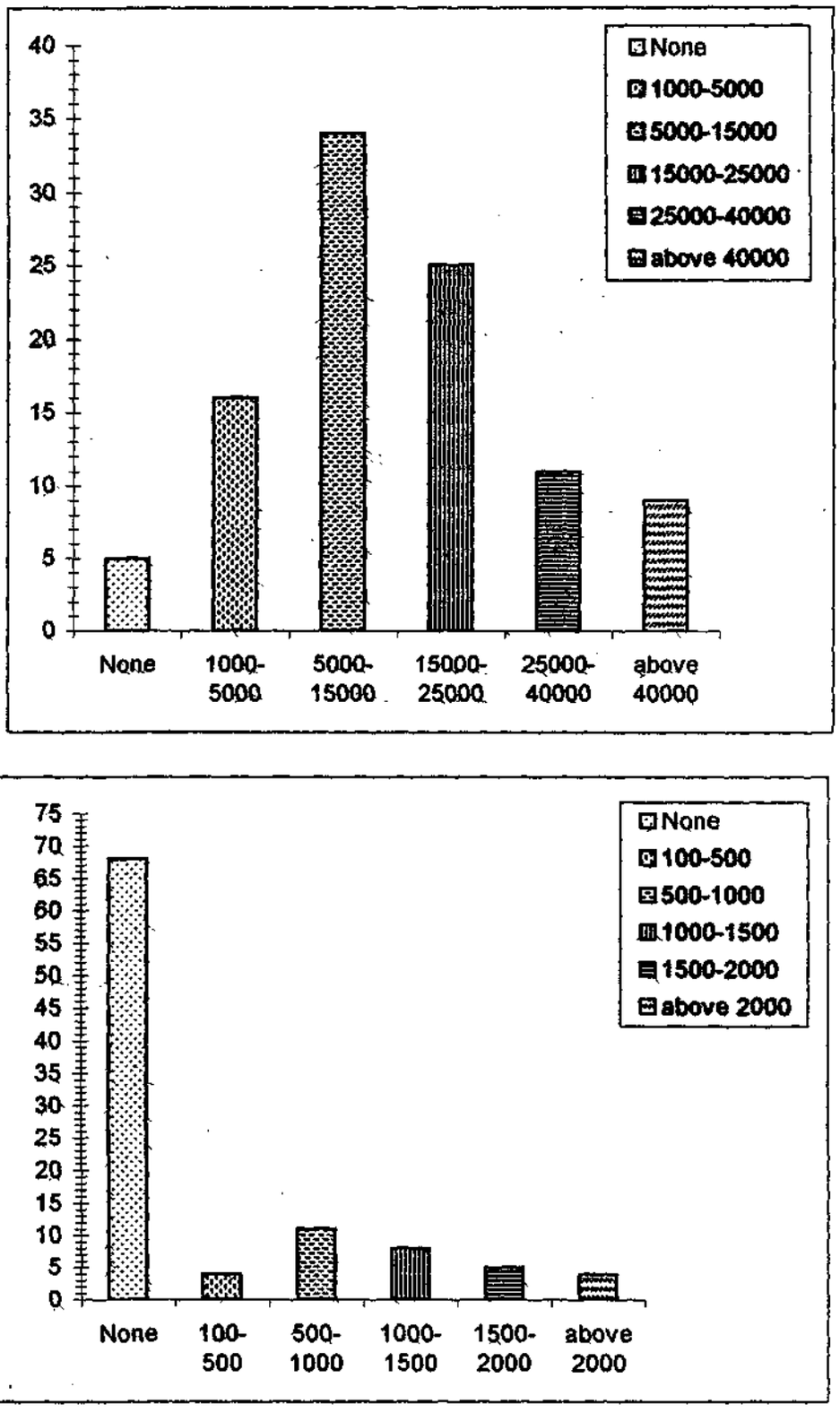


Fig 11 : Comparison between expenditure on fertilizer and on liquid biofertilizer

5.2 Reasons for negligence to use liquid biofertilizers

It is seen that only 32 per cent of the surveyed farmers were using Liquid biofertilizers.

Farmers responded in various ways to this question such as they are not aware about product, don't know method of application, don't know recommended dose, it develops physical disorders in plant, etc. The respondent farmers in accordance with the reasons for the negligence to use liquid biofertilizers were classified and the same information is given in Table 5.12.

Table 5.12 : Reasons for negligence to use liquid biofertilizers.

Sr. No.	Reasons	Percentage
1.	It develops physical disorders	5.8
2.	Several applications needed	14.7
3.	Don't know method of application	11.76
4.	Costly	19.82
5.	Unawareness about product	48.52

It is observed from the table that about 49 per cent respondent farmers were not aware about the product and hence they have not used the product. The reasons such as costly product, several applications needed, not aware about application methods and it develops physical disorders was given by 19.82, 14.7, 11.76 and 5.8 per cent respondents respectively.

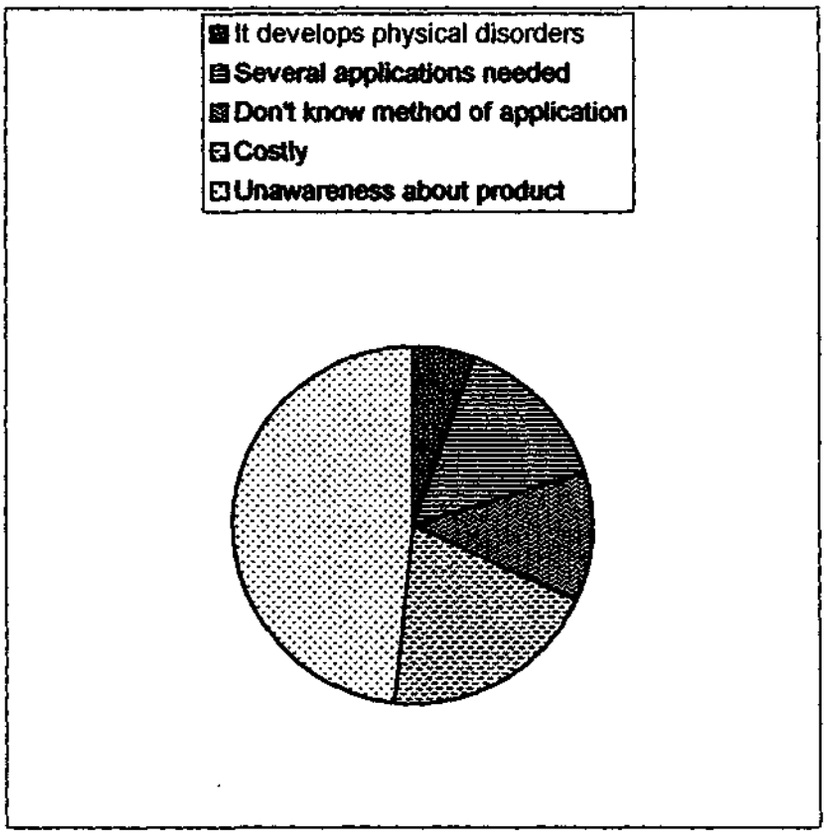


Fig 12 : Reasons for negligence to use liquid biofertilizer

5.3 Comparison of competitors and product awareness

It is seen from the survey that 32 per cent of the surveyed farmers were using liquid biofertilizers or aware about it.

Out of that 28.12 per cent farmers were aware about the product. Mostly used Liquid biofertilizer by the farmers was Biozyme. Thus it can be said that Biozyme is the main competitors to the plantozyme in market. Although other products such as Swazyme, cytozyme and superzyme had good contribution in market.

The respondents have been classified according to the awareness of different products and the same has been given in Table 5.13.

Table 5.13 : Comparison of competitors and product awareness.

Sr.No.	Product (company)	Percentage
1.	Biozyme (wockhardt)	31.25
2.	Plantozyme (Pralshar)	28.12
3.	Cytozyme (SPIC)	12.5
4.	Swazyme (Swaroop)	15.62
5.	Superzyme (ShivAgro)	9.48
6.	Masizyme (Mauni Agro)	3.125

It could be revealed from the table that the Biozyme (Wockhardt) is the main competitor in the market followed by Cytozyme, Swazyme, Superzyme and Masizyme.

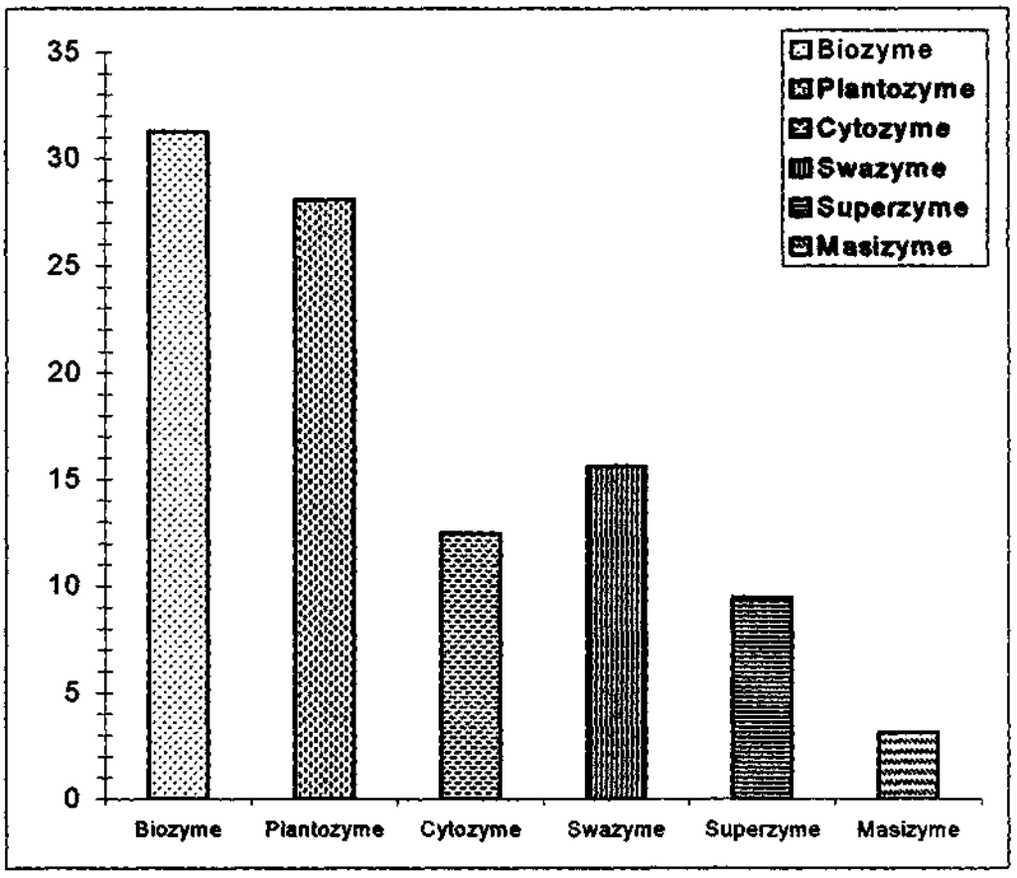


Fig 13 : Comparison of competitors and product awareness

5.4 Level of awareness amongst the farmers about their soil problems and product

5.4.1 Sources from where farmers know about product

It is seen from the Table 5.14 that 40 per cent farmers were aware about product from the dealers and 21.1 per cent farmers were aware about the product from Kisan 1998. Contribution of company representatives and advertising department is very low.

The respondent farmers are classified according to the sources from where they knew about product and the details are given in Table 5.14.

Table 5.14 : Sources from where farmers know about product

Sr.No.	Sources	Percentage
1.	Company representative	9.37
2.	Friends	15.62
3.	TV/News papers	6.25
4.	Wall painting/pamphlets books, etc.	6.25
5.	Dealers	40.745
6.	Kisan 1998	21.87

5.4.2 Awareness of farmers about there soil problems

An attempt was made to see how many farmers were aware of the soil problem of their region and only 10 per cent of the surveyed farmers responded affirmatively. It is seen that only educated farmers were aware

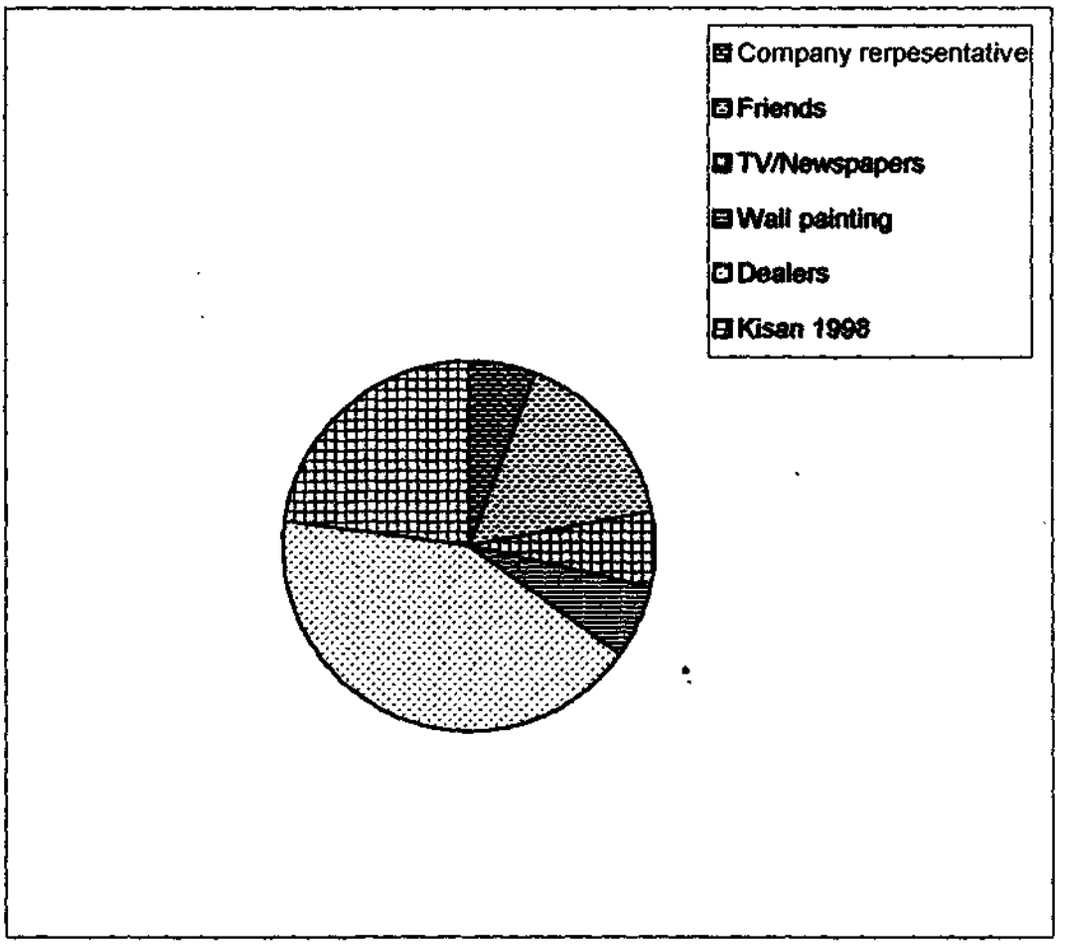


Fig 14 : Source from where farmers know about product

about their soil problems and they responded affirmatively. But it is seen that none of the farmers was applying fertilizer as per recommendation. There was more application of fertilizers than recommended. In the survey farmers along the canal or river side were having problem of water logging, and salinity problem mostly to the sugarcane and grape growers which is due to high fertilizer use. When asked about any measures taken to avoid these problems most of the farmers told that no measures were adopted. Some farmers were using chemical to avoid problem of alkalinity and salinity.

5.5 To know about additions to the product if any and probable inputs of promotion mixture

a) When the information about product is given to the farmers and were asked about any addition to the product to make it ideal one, the common answer was to increase the proportion of chemicals used in product.

b) Certain reasons tackled for the farmers not using Liquid biofertilizers were as below.

a) Liquid biofertilizers available in market are costly.

b) Few farmers grown as tradition and wild crops, so inputs are not applied.

c) Labour and water scarcity has restricted use of fertilizers at some places in Pune district.

d) Unawareness about the product is the important reason.

e) Several applications needed.

f) Low rates of nutrients applied in single application.

g) It develops physical disorders in plants.

c) When asked to the farmers and dealers about product promotion in their region. Opinions expressed by them were compiled and the same are presented below.

a) Reduce the cost of the product

b) Advertisement is essential

c) Change the packing

d) Field demonstrations needed

e) Advisory counters in villages should be arranged

f) Farmers ralley and seminars should be arranged

g) Few sample packs should be given to farmers

h) Personal visit to farmers and dealers by company representative

Summary and Conclusions

6. SUMMARY AND CONCLUSIONS

The market survey for plantozyme liquid biofertilizer was carried out for the PRALSHAR Bio-products Pvt. Ltd. for the Pune district. The major objective of the survey was to study the use levels of liquid biofertilizers in Pune district and also to understand reasons for the farmers not using liquid biofertilizers.

The survey was carried out over a period of two months. It was confined to Pune district. The sampling method used was a simple random sampling technique. The survey used both personal interview as well as questionnaire method to cover the sample size of one hundred. The second half of the survey involved analysis of the findings. The survey revealed that Pralshar Bioproducts Pvt. Ltd. poised for a growth in the coming years and it is definitely an area where this company should enter.

The problem 'Marketing of plantozyme Liquid Biofertilizer in Pune district has been studied with the following specific objectives-

1. To study use levels of Liquid biofertilizer.
2. Reason for negligence to use it
3. To know active competitors in market
4. To know the level of awareness among the farmers about their soil problems and about product

5. To know about additions to product if any and probable inputs of promotion mixture.

6.1 Summary

The cropping pattern in all the selected villages was more or less same in both the kharif and rabi seasons. In kharif season bajra, groundnut, tomato, potato are the main crops grown, while in rabi season wheat, gram, potato, onion are the main crops. In summer generally onion, bajra and fodder crops are taken, while sugarcane, grape and banana crops are taken as annual crops.

About 45 per cent of the surveyed farmers were having primary education, 10 per cent were uneducated, 30 per cent having secondary education and 15 per cent having Higher secondary and graduate level education. The significant relationship between education and adoption of product was observed.

About 54 per cent farmers found below 41 years followed by 33 per cent and thirteen per cent of 31 to 40 years and below 30 years respectively. The non-significant relationship was observed between age and adoption of liquid biofertilizers.

The survey showed that 44 per cent farmers were having land holding less than 4 hectares, 36 per cent farmer were having land between 4

to 8 hectares, 14 per cent farmers were having land between 8-16 hectares which was followed by 8 per cent above 16 hectares. It is found that there was non significant relationship between land holding and adoption of biofertilizers.

It has been found that 57 per cent farmers were having annual income less than Rs.50,000, 21 per cent farmers having annual income between Rs.50,000 to Rs. 1 lakh, 9 per cent farmers having annual income between Rs.1 to Rs. 1.5 lakh followed by 13 per cent farmers having annual income above Rs.1.5 lakh. There was significant correlation between annual income and adoption of biofertilizers.

Ninety five per cent farmers were using fertilizers. Out of this, 20 per cent using only organic fertilizers, 25 per cent using only inorganic fertilizers and 55 per cent were using both.

It was observed that majority of farmers were not participating in social activities (40 per cent). Out of total respondents, 27 per cent were found participating in milk societies followed by 10 per cent in sugar factory.

During survey, it was found that Biozyme of Wockhardt company is the main competitor for the Plantozyme followed by Cytozyme (SPIC), Superzyme (ShivAgro) and Masizyme (MauniAgro).

About 48 per cent farmers not using liquid biofertilizer because they were not aware about product. About 19 per cent said that the product is costly, about 14 per cent farmers stated that it requires several applications and the same was followed by the respondents stating that it develops physical disorders in plants.

It is found that main source of information about product to farmers was dealer (40 per cent). Second most important source was Kisan 1998 (21 per cent) followed by friends (15 per cent), company representative (9 per cent) and TV or newspaper (6.25 per cent).

It is found that less farmers (10 per cent) were aware about their soil problems. Soils along the canal river side having problem of water logging which was due to high fertilization.

Most of the farmers said that increase the quality of the product when asked about any addition to the product. Most of the farmers replied that reduce the cost of product (62 per cent) when asked about the product promotion.

6.2 Conclusions

It is seen that 32 per cent of the total farmers surveyed were aware about the Liquid biofertilizers. Remaining 68 per cent were not using the product, 48 per cent of them were not aware about the product and

remaining not used it due to various reasons such as it develops physical disorders in plants, it is costly, several application are needed, etc.

It was further revealed from the study that the non awareness is the main cause in the fertilizer promotion so great efforts are needed in respect to the advertisement, publicity of products, field demonstration for the product promotion in the region.

Tendency of farmers in using chemical fertilizers is changing and there is wide scope for the Liquid biofertilizers as most of the farmers diverting from chemical fertilizers to biofertilizers. Also the trend is that farmers using liquid biofertilizers than solid one. It is because of slow nutrient release from solid biofertilizers, more labour requirement, etc.

Thus, it could be concluded that there is wide scope for growth of liquid biofertilizer industry in near future.

6.3 Suggestions

The marketing mix is a mixture of all marketing ingredients. The Marketing Manager is the mixture of all ingredients and he creates a mix combinations of all marketing elements and resources. Marketing mix offers an optimum or least cost combination of all marketing ingredients in order to enable realization of organization objectives.

The marketing mix is a mixture of four basic inputs blended by marketing manager they are :

i) Product ii) Price

iii) Place iv) promotion

The fifth ingredient P is the people.

The marketing mixture will be changing according to the changing environmental factors (technical, social, economic and political) affecting each market. It must be fully related to customer demand, competition and other factors.

Efforts have been made to give suggestions on the prescribed objectives of the study in concern with 4 P's of marketing.

1) Product Variable :

Philip Kotler has defined product as anything that can be offered to a market for attention, acquisition, use or consumption that might satisfy want or need. Company presently has three products in market namely Plantozyme granules, Plantozyme liquid, *Trichoderma viridae*. Of these all products have good image in market so it is not necessary to withdraw any of them or make any price variation.

Package itself is a salient and forceful salesman, seeing the complaints of farmers and dealers about packing, it should be improved.

a) Packing appearance should be attractive

b) Presently packets of 100 ml, 200 ml, 500 ml, 1 lit and 5 lit are available in market. Considering demand of 60 ml, 90 ml packets, efforts be made to provide these packets.

It is noticed during survey that labeling of packets was not good i.e. labeling removed during handling so firm labeling should be done and it should be attractive.

2) Price variable

In a commodity like fertilizer, 'pricing' is indisputably a very difficult area for decision making. Pricing can be based on cost of production and marketing or market conditions.

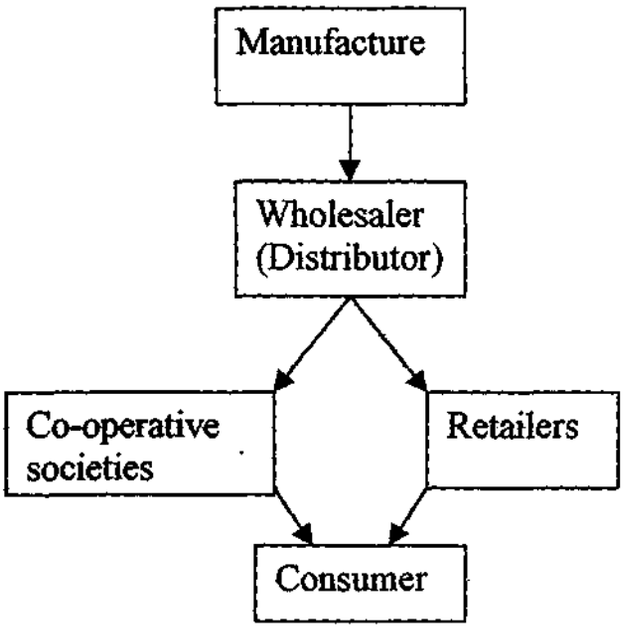
Taking into account, the present prices of Liquid biofertilizer in market, plantozyme per litre cost is Rs.455, Biozyme Rs.445 per litre, Cytozyme Rs.425 per litre, Swazyme Rs.535 per litre, Superzyme Rs.525 per litre Masizyme Rs.415 per litre, it can be said that price range of Plantosyme is medium. Although the farmers saying about higher price of product, it is not necessary to decrease or increase the cost of product.

Although discounts can be given to the dealers for certain favourable acts such as early payment, cash purchase, etc. Taking into consideration, dealers complaint about no scheme in purchase of product,

late cash delivery, cash discounts can be given to them on bulk purchase and also some rewards may be kept for sale of given lot within time.

3) Place or distribution variable

While studying the present channel of distribution, it is seen that sale of product is not undergone through co-operatives. In the survey of farmers it is seen that 27 per cent of farmers were members of milk societies, 11 per cent of co-operative societies and 14 per cent of sugar factories, so there is great scope for sale of product through co-operatives following channel is suggested for effective distribution.



4) Promotion variable

Promotion is a process of marketing communication involving exchange of information, persuation and influence.

Answers to the question of any promotional strategy for product promotion were usually same. The main constraint found in the promotion of product was unawareness about the product. About 48 per cent farmers were not aware about the product.

Some suggestions are made for promotion of product.

Numerous crop demonstrations in Kharif, Rabi and Hot weather seasons on farmers field.

Trials on government and sugar factory farms

Farmers meetings

Farm youth training programmes

Audio-visual display for educating farmers.

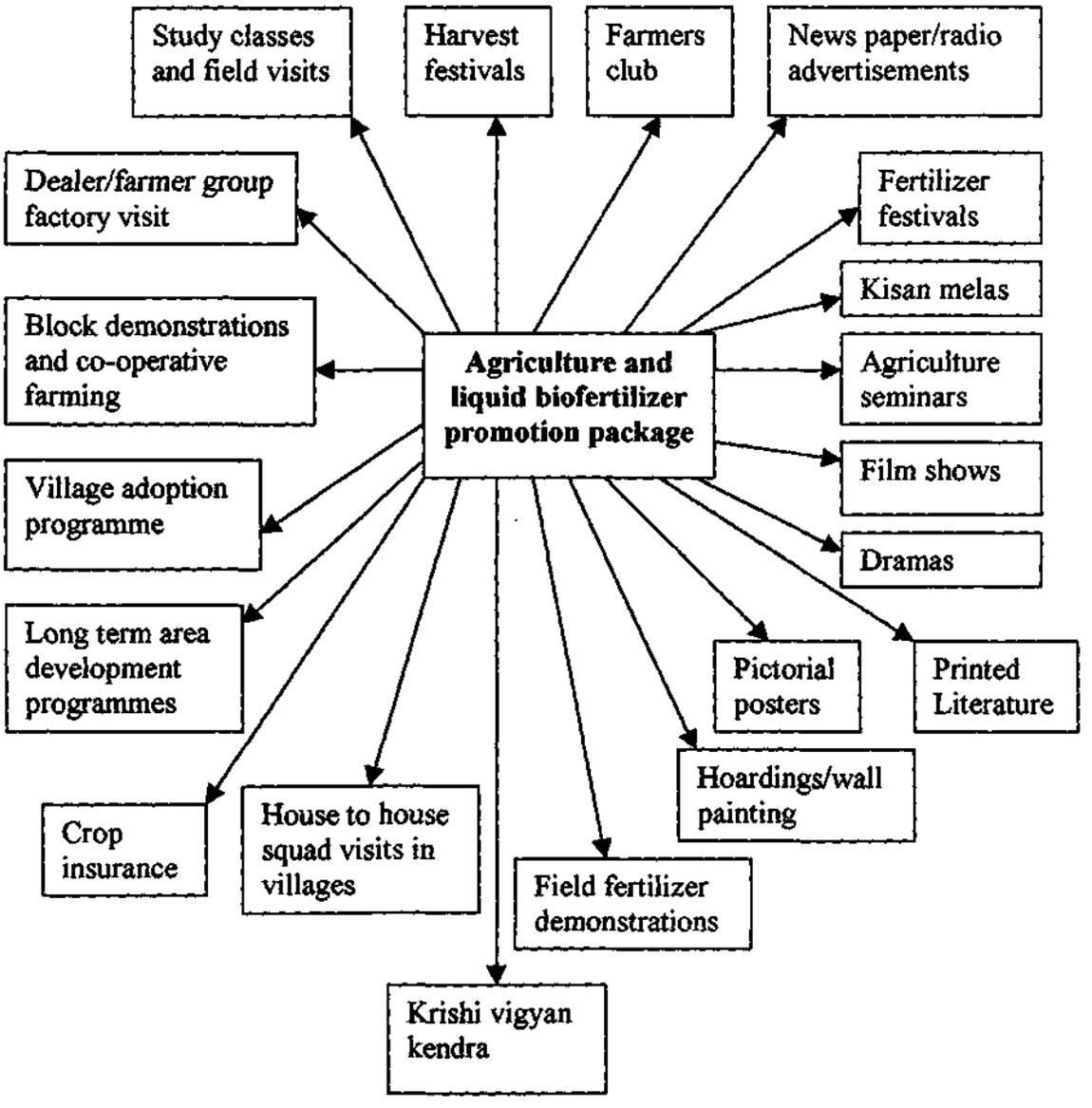
Literature on Liquid biofertilizers in Marathi, Hindi and English be distributed free of cost

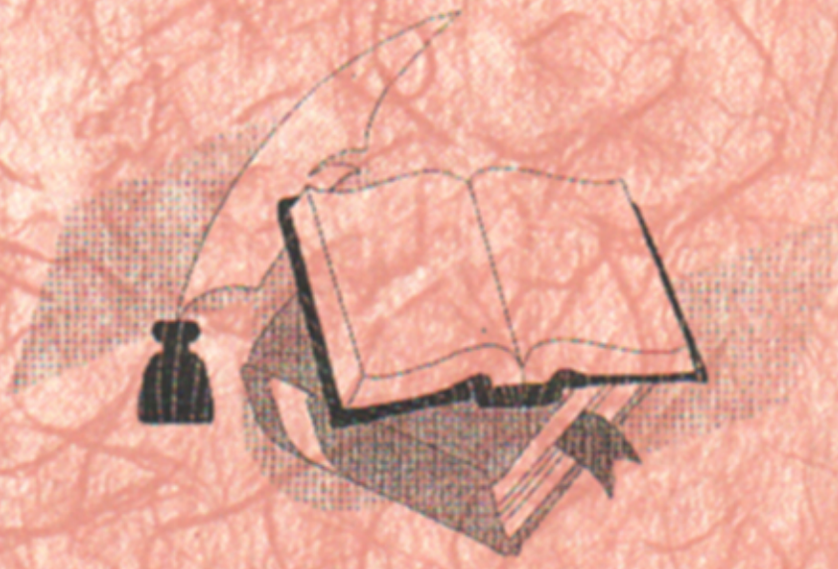
Paper stickers of company are needed to be distributed to Farm Information Centres, and various institutional agencies, etc.

Frequent publicity of product through local news papers and through magazine published every month by company which should be circulated among the farmers.

Product should be highlighted at exhibitions, various fairs and festivals.

Fig 15 : Agriculture and Liquid Biofertilizer Promotion Package





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APPENDICES

8. APPENDICES

8·1 QUESTIONNAIRE FOR THE FARMERS

1. Name of the farmer :

2. Address : Village :

Tal. : District : Pune

3. Age : Yrs. _____

4. Education :

1) Primary 2) Secondary

3) Graduation 4) Uneducated

5) No.of members in family :

Sr. No.	Name	Age	Relation with farmer	Education	Whether earning/ Non earning

6) Give details on following :

Sr.No.	Organisation	Name of family member	Post held
a.	Grampanchayat		
b.	Sugar factory		
c.	Milk society		
d.	PACs		
e.	Others		

7. Side Business if any :

8. Size of Farm :

Irrigated (ha)	Value (Rs.)	Rainfed (ha)	Value (Rs.)	Land Revenue (Rs.)

9. Sources of irrigation :

i) Tubewell, ii) Well, iii) Lift, iv) Canal, v) Tank, vi) Others

10. Crops grown :

Crops	Area (ha)
Kharif	
Rabi	
Summer	
Perennial	

11. Are you aware of the problems of your soil ? Yes/No

12. If Yes, whether soil testing measures adopted. Yes/No

13. What are the problems in your soil ?

i) Salinity ii) Alkalinity

iii) Water logging iv) Others

14. What measures you presently taken to avoid it?
    i) Change in cropping pattern
    ii) Crop rotation
    iii) Green manuring
    iv) Chemicals used (mention)
    v) Others

15. What is pH of your soil ?

16. Are you applying fertilizer dose as per recommendation?
    Yes/No

17. What is your annual income ? (Rs. _____)

18. What are the most paying crops ?

19. Inputs used :
    i) Insecticides
    ii) Fungicides
    iii) Wedicides
    iv) Fertilizers - (Organic) (Inorganic)

20. Do you know about biofertilizers.
    Yes/No

21. Do you know about liquid biofertilizers.
    Yes/No

22. If yes, which liquid fertilizers do you use ?
    (Organic) (Inorganic)

23. If no what are the reasons for not using liquid biofertilizers.
    i) Marginal leafburn (Plant develop disorder)
    ii) Costly
    iii) Low rates of nutrients applied in single application
    iv) Several applications needed
    v) Others
    vi) Unawareness
    vii) Methods of application

24. Have you heard Plantozyme.
Yes/No

25. If yes, : Sources -
i) Company representative
ii) Friends
iii) TV/Newspapers
iv) Wall painting (Advertising)
v) Dealers
vi) Other
vii) Farmer's ralley

26. Whether you have used Plantozyme ?
Yes/No

27. Are you interested in product ?
Yes/No

28. If yes, sources from where you would get it ?
i) Dealer
ii) Co-operative
iii) Others

29. If no, What are the reasons ?
i) It is costly
ii) Not aware about it
iii) It damages to crop
iv) Others

30. Any problem faced while purchasing ?

31. How Plantozyme is applied ?
i) Aerially
ii) Soil application

32. Whether you have used it on limited or whole area ?
i) Limited area :- (ha)
ii) Whole area :- (ha)

33. Are you using these products each year for each crop ?
Yes/No

34. If yes, Why ? What benefits you find from these products ?
i) Increases greenness of leaves
ii) Increase production
iii) Increase disease resistance
iv) Easy to handle
v) Easy for application
vi) Others

35. How much money do you spend on fertilizers ? Rs. _____

36. How much money spend on biofertilizers ? Rs. _____

37. Did you use any other liquid biofertilizers other than Plantozyme ?

Yes/No

38. If yes, which liquid biofertilizers do you use ?

39. What is your opinion about the cost of Plantozyme as compared to other liquid bio-fertilizer ?

40. What according to you should be the additions to the Product ?
i) Increase the N/P/K
ii) Add Growth regulators
iii) Others

41. What according to you are the probable ways of product promotion in your region ?
i) Reduce cost
ii) Through Dealers at Taluka/Village level
iii) Advertisement
iv) Change in packing
v) Field demonstrations
vi) Farmers ralley
vii) Others.

8.2 Theoretical Background

Marketing is the business function that identifies customer needs and wants, determines which target market the organisation can serve best and designs appropriate products, services and programmes to serve these markets. However, marketing is much more than just an isolated business function – it is philosophy that guides the entire organisation. The goal of marketing is to create customer satisfaction profitably by building value laden relationship with important customers. Marketing calls upon everyone in the organisation to "think customer" and do all they can to help create and deliver superior customer value and satisfaction.

Marketing : "Marketing is a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others".

Marketing functions :

I) Ownership transfer	- Buying
II) Distribution	- Selling, transport, storage
III) Other functions	- Standardisation and grading, Branding, packing, salesmanship, Advertising, sales promotion, insurance, marketing research, market intelligence, finance

Marketing Research

It is process of systematic, objective and intensive collection, study and analysis of data relevant to the identification and solution of any problem in the field of marketing.

Areas of Marketing Research

i) Product, ii) Price,

iii) Promotion, iv) Distribution

Marketing Mix

Marketing mix is a mixture of four basic inputs blended by marketing manager. They are –

1) **Product Mix -** It has four components.

   a) Product range b) Service after sales

   c) Brand d) Package and labelling

2) **Price Mix**

   It includes pricing, discounts, allowances and terms of credit. It deals with price competition.

3) **Distribution Mix**

   It includes the channels of distribution, transportation, warehousing and inventory control.

4) **Promotion Mix**

   It covers advertising, personal selling, sales promotion, public relations, exhibitions and demonstrations used in promotion of sales.

5) **People**

8.3 Company Profile

The information given below is taken from the company publications only

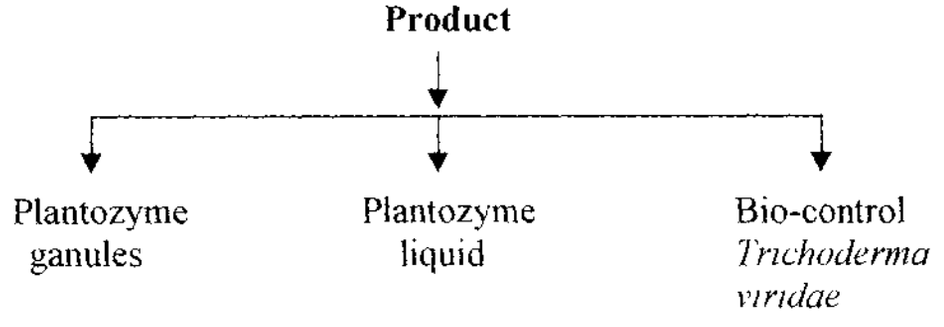
Plantozyme

Plantozyme is prepared by extract of algae *Ascophylum rotudus*. It is used for fruits, vegetables, sugarcane and for all other crops. After spraying, it enters in to the all plant parts. It's application dose is 200 ml per acre. It's use is as given below :

- Promotes profuse root growth particularly of the white roots
- Increase the yield by 15 to 20 per cent
- Increase the resistance to disease attack and draught resistance
- Plants mature early thus counteracts the effect of excess nitrogen application
- Production is also improved i.e. keeping quality, size, colour and luster.
- It increases photosynthesis rate. Plantozyme content cytokinin, auxins, precurbetin and amino acids.
- Vitamins like riboflavin, thiamine, Vitamin B12 helps in vigorous plant growth
- Uptake of K and Mn is better due to better absorption of P.

Pratshar Bio-Product Pvt. Ltd.

Company has introduced three products in market shown as below :



LIST OF ABBREVIATIONS

a.i.	:	Active ingredient
BF	:	Biofertilizer
FAI	:	Fertilizer Association of India
GSFC	:	Gujrath State Fertilizer Company
INSS	:	Integrated Nutrient Supply System
MFL	:	Madras Fertilizer Limited
NAFED	:	National Agricultural Co-operative Marketing Federation
R & D	:	Research and Development
VAM	:	Vascicular Arbuscular Mycorrhiza

Vita

9. VITA

AMIT BABANRAO KANADE

A Candidate for the degree of

of

MASTER OF SCIENCE (AGRICLTURE)

IN

AGRI-BUSINESS MANAGEMENT

2000

Title of the Thesis	:	"Marketing of Plantozyme Liquid Biofetilizer in Pune district"
Major Field	:	Agri-Business Management

Biographical Information:

Personal Data	:	Born at Ghodegaon, Tal. Ambegaon, Dist. Pune on 14th November, 1977. Son of Shri. Babanrao Dhondiba Kanade and Sau. Kamal Babanrao Kanade.
Educational Qualification:	-	Completed Primary Education at J.S.M. Manchar, Secondary Education at M.G. Vidyalaya, Manchar.
	-	Completed Higher Secondary Education at A.A. College, Manchar, Tal. Ambegaon, Dist. Pune 410 503.
	-	Completed B.Sc. (Agri.) degree with First Class at College of Agriculture, Pune, M.P.K.V., Rahuri in 1998.

Co-curricular Activities:

- NCC 'B' and 'C' certificate
- Individual General Championship (in Athletics), for the years 1995-96 and 1996-97 in Inter Collegiate sports.
- Participated in Inter University Kho-Kho tournaments held at Banglore in 1994-95 and at Tumkur in 1995-96.
- Participated in Inter University Hockey tournaments held at Gwalior in the year 1998-99.