
ACCEPTANCE OF INNOVATION IN AGROCHEMICAL INDUSTRY

Prof. Iftiqar Mistry

NCRD's Sterling Institute of Management
Studies, Nerul, NaviMumbai.

Prof. Dr. N. Mahesh

Head of Department, MMS,
A.C. Patil College of Engineering and
Management, Kharghar, Navi Mumbai.

ABSTRACT

Agrochemical market in India is predicted to grow steadily at a CAGR of 9% in coming two years. Availability of credit facility to purchase the agrochemicals is now the primary driver for the rapid growth of the market. Indian government has been focusing on small and marginal farmers and the weaker sections of the society, so as to enable them to accept modern technology and improved agricultural practices, focusing on to increase agricultural production and productivity.

The Insecticide segment did hold the largest share of the agrochemicals market in India during 2015, with a market share of around 56%. The dominance of this segment is expected to continue over the next five years. New technology and new molecules are being introduced by the industry in this growing scenario. The adaption of this technology is very important by the farmers in India.

The key vendors in the market are Bayer, BASF, Rallies, Syngenta, UPL and prominent vendors are Dhanuka, Dow Agro science, DuPont and Insecticides India. The growth all vendors in agrochemical industry depends on adaption of new technology by farmers.

Keywords- Perception, Pesticides , Agrochemical Market

INTRODUCTION

India is fourth largest producer of agrochemicals globally after United States, Japan and China. The agrochemical industry is significant industry for the Indian economy. Indian population is increasing and the per capita size of land is decreasing, the use of pesticides in India has to improve further. The crop protection industry in India is generic in nature with ~80% of the molecules being non patented.

Hence, strong distribution network and brand image act as competitive factors. Crop protection chemicals are manufactured as technical grade sand converted into formulations for agricultural use. The crop protection industry consists of technical grade manufacturers, formulators producing the end products, distributors and end use customers.

The Indian agrochemicals market is characterized by low capacity utilization. The total installed capacity in FY15 was 186,000 tons and total production was 125,000 tons leading to a low capacity utilization of 78%. The industry suffers from high inventory (owing to seasonal & irregular demand on account of monsoons) and long credit periods to farmers, thus making operations 'working capital' intensive. India due to its inherent strength of low-cost manufacturing and qualified low-cost manpower is a net exporter of pesticides to countries such as USA and some European & African countries. Exports formed ~50% of total industry turnover.

KEY SEGMENTS

There are broadly five categories of crop protection products

Insecticides: Insecticides protect crops by killing insects or preventing their attack. Insecticides protect crops by killing insects preventing their attack. Insecticides are used to manage the pest population below the economic threshold level.

Fungicides: They are used to prevent the deterioration of crops due to fungi infestation. They are classified either as protectants or eradicants. Protectant fungicides prevent or inhibit fungal growth and may have to be applied at regular intervals. Eradicant fungicides kill the pests on application.

Herbicides: herbicides or weedicides are used to prevent the growth of unwanted plants in a crop field. Herbicides could be selective, which kill the unwanted plants in a crop field without harming the main crop or non-selective which kills all the crops.

Bio-pesticides: These are derived from natural substances like plants, animals, bacteria and certain minerals which do control the pests by nontoxic mechanisms. Bio-pesticides are considered eco-friendly and easy to use.

Others (Nematocides, Rodenticides etc.): They are used to prevent the attack of pests during storage of crops.

REVIEW OF LITERATURE

The key trends in market are- Focus has been on developing environmentally safe pesticides by the industry as well as the government. Focus by larger companies on brand building by conducting awareness camps for farmers and providing complete solutions. There is increase in the strategic alliance among larger players for greater market reach and acquisitions of smaller companies globally to diversify product portfolio.

Since the Indian agrochemical sector is highly dependent on monsoons, the market for agrochemicals is expected to grow at a conservative growth rate of 8% to reach USD 2.26 Bn by FY 16. India has 16% of the world's population. Increasing population and high emphasis on achieving food grain self sufficiency are expected to drive growth. Buoyed by 50% growth in horticulture and floriculture the growth is expected. Government of India has launched a national horticulture mission to double the production. Growing horticulture and floriculture industry will result in increasing demand for agrochemicals, especially fungicides.

As per the government of India estimate, total value of crops lost due to non use of pesticides is around USD 17 Bn every year. Companies are increasing the training of farmers regarding the right use of agrochemicals in terms of quantity to be used, the right application methodology and appropriate chemicals to be used for the pest problems. With increasing awareness the use of agrochemicals is expected to increase.

The Indian market abounds with many examples where innovative and customized solutions have grown the market and catapulted the first movers to market leaders. If the holistic and innovative approach for example even with pulses is considered, given the timely availability of nutrients, proper chemical management, requisite irrigation and proper storage will lead to double its production. Arriving at solution innovatively will enhance the yield of each and every

crop grown. However the real challenge lies in execution, first movers will be able to reap the benefit and enjoy sustainable growth.

Agrochemical companies could adopt specific crops or geographies within their sphere of influence and help farmers increase output. They should train for innovation by increasing farmers awareness through demonstration and extension service, propagating better farm practices ensuring right usage of hybrids and providing better storage practices to reduce pest harvest losses. The power of IT can be effectively leveraged to provide guidance to farmers for improving productivity, addressing pest related issues and optimizing the value chain

OBJECTIVES AND NEED OF THE STUDY

- To study the consumer behaviour and perception For Acceptance of Innovation in Agriculture markets.
- To conducting primary research of pesticide market

NEED OF THE STUDY

It has been observed that per capita consumption of crops in India is very low as compared with other developed countries. This is because of low productivity and there by low production it happens because of improper cultivation of crops, most of the crops get destroyed because of insects and pest attack. Having more than 110 crore of population On the other hand productivity of crops is less and prices offered to the producers are very low. In short, there are no sizable incentives to the crop producers. It was therefore, necessary to undertake an independent study for throwing a light on the various aspects of Agrochemicals i.e. marketing, pricing, various marketing medium, whether the adoption of new technology is the key factor which will decide the growth of industry.

DESCRIPTION OF THE PROBLEMS

The changing global market environment, farmer's awareness and knowledge, significant development in research and development, and role played by government has greatly affected the agrochemical industry. There are various problem associate with the agrochemical company can be summarized as follow;

1. It is necessary to increase awareness among farmers regarding agrochemicals and acceptance of Innovation.
2. It is necessary to highlight technology aspects of application of chemicals.

DESCRIPTION OF THE RESEARCH

This research is the type of Survey research which includes Random sampling farmers. It began with problem identification, and to arrive at a conclusion, which includes secondary data as well as information from primary data from survey.

SAMPLE SIZE

Researcher has chosen **Random Sampling** method as a part of Sampling from Nashik District. The sample surveyed is drawn from 10 talukas in Nashik district covering the most important cash crop grown in Nashik district i.e., Grape . A sample from population was taken selecting

farmers for the survey. Therefore, the study was undertaken on representative sample of farmers to make it more manageable. A survey of 250 farmers was carried on in various parts of Nashik district.

DATA ANALYSIS & INTERPRETATION

1) Practise of mixed cropping?

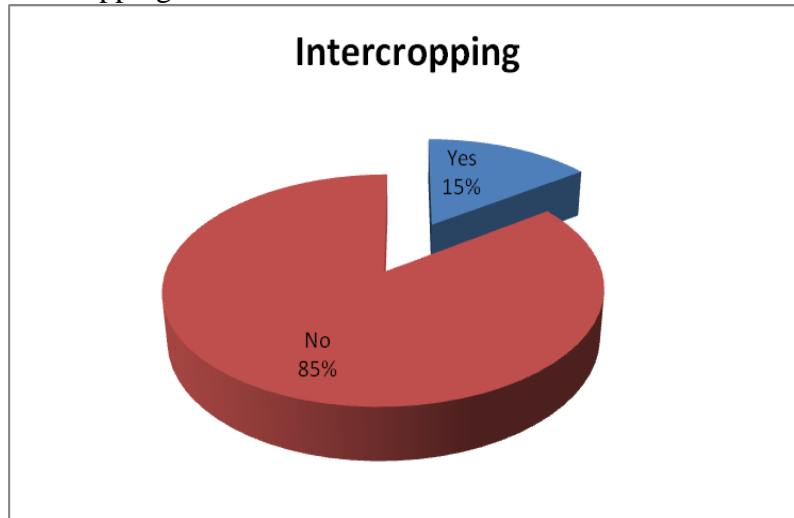


Figure 1- Intercropping by Farmers.

Analysis: Intercropping is practised only by small percentage of farmers in Grapes as compared with other crops.

2) What is the total expenditure for sprays for a year?

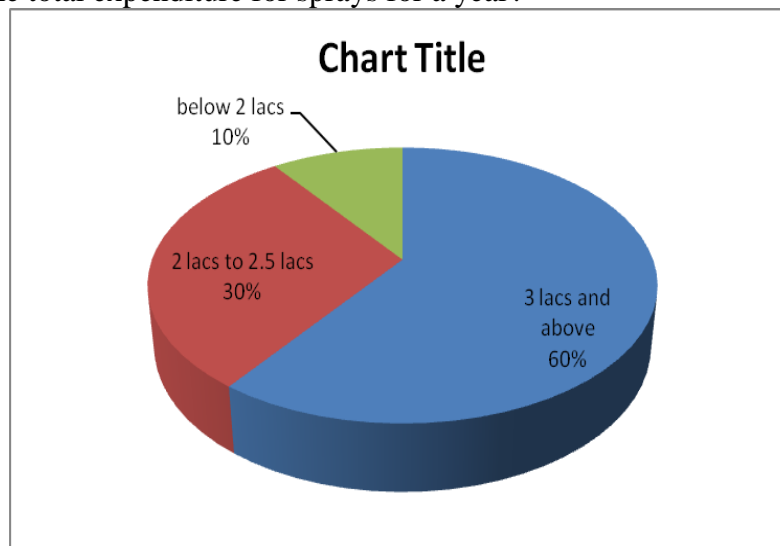


Figure 1-Total expenditure for sprays for a year

Analysis: It was observed that in the total expenditure for sprays for a year 60 % of farmers spend above 3 Lacs of their expenditure over spray for a year. Likewise 30% of farmers spend 2 –lac to 2.5 lacs, 10% of farmers spend 2 lacs and below.

- 3) Which is the preferred company from which you purchase the agrochemicals? Why?

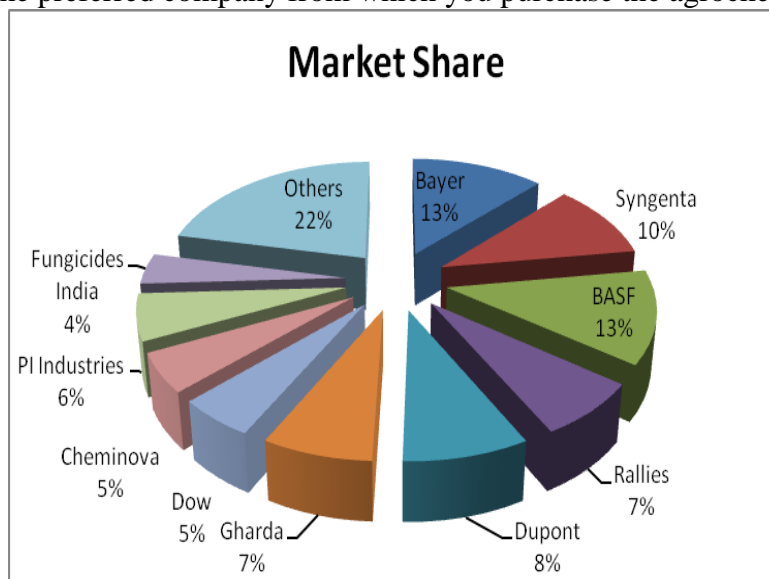


Figure 2-Market share of companies as per the purchasing pattern from Farmers.

Analysis: It was observed that majority of farmer's i.e. 13 % prefer Bayer and BASF for purchasing agrochemicals. Likewise 10% of farmers go for Syngenta 08 % of farmers go for Dupont, 07 % of farmers go for Rallies remaining for other companies. Their choice depends upon many factors like their loyalty to the company because of their quality of products which help to increase their farm's yield.

- 4) How do you know about the new launches of the company?

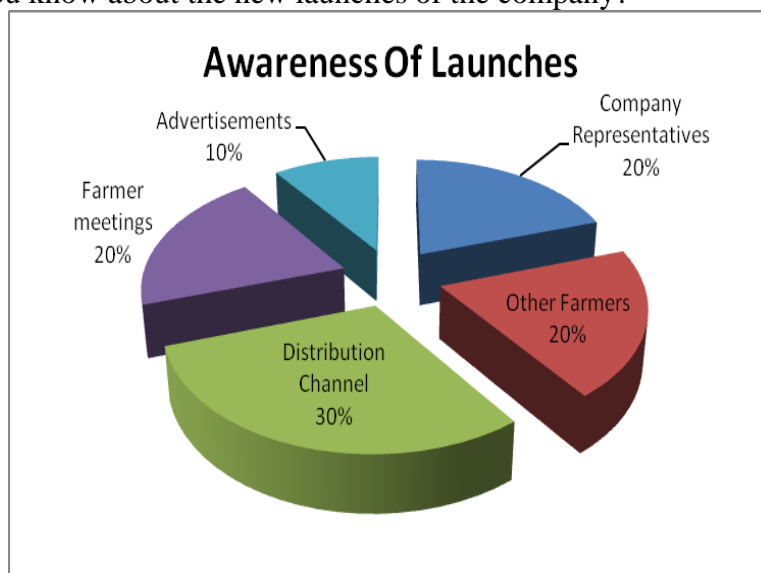


Figure 3-Awareness of New launches of Company

Analysis: Critical success factors that help farmers to increase their awareness in new launches of companies were identified, viz; through Distributors, advertisements, company representatives and other farmers. Distributors plays major role in influencing buying behaviour and Perception of Farmers.

5) Do you immediately purchase the new chemicals launched?

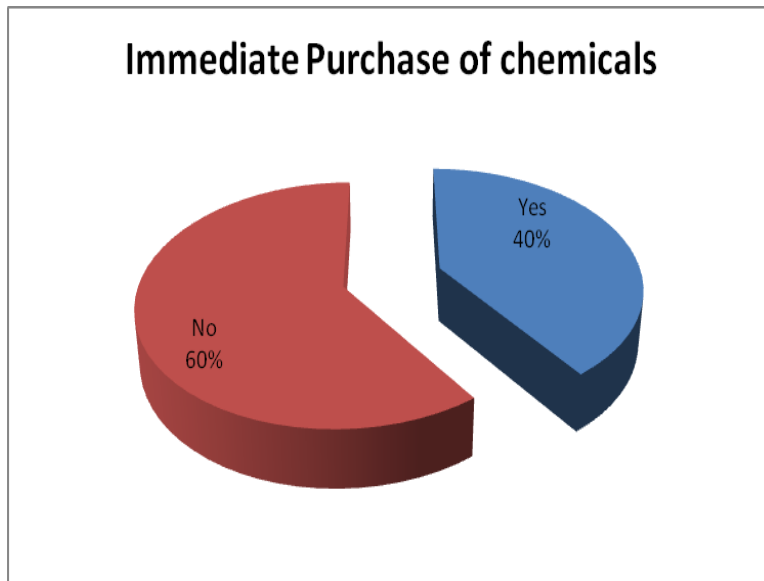
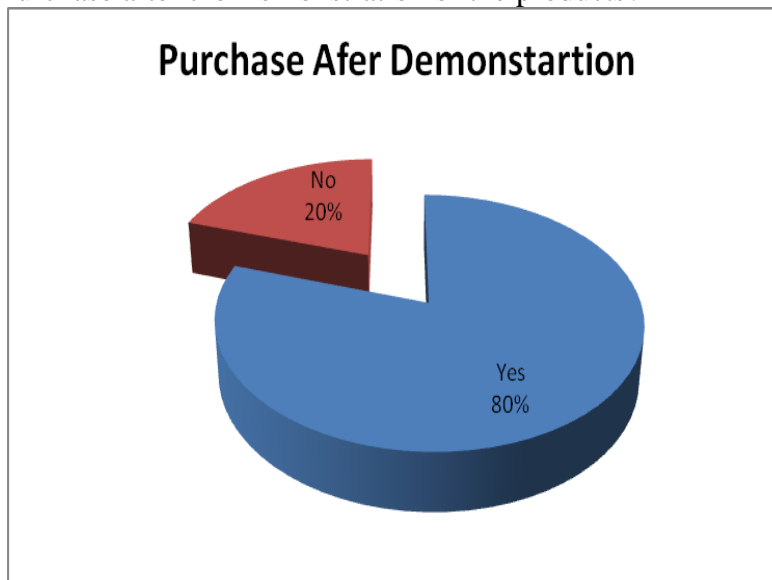


Figure 4-Immediate Purchase of Chemicals

Analysis: Critical success factors in determining the choice of the product was identified, viz; Distributors, Newspaper, T.V., Hoardings. Distribution Channel plays major role in influencing buying behaviour and Perception of Farmers.

6) Does you Purchase after the Demonstration of the products?



Analysis: From the farmers responses it was observed that majority of farmers do purchase the product after successful demonstration of the products on the field.

- 7) At the time of purchase of two identical chemicals where do you give preference?
A) Brand
B) Advertisement
C) Money

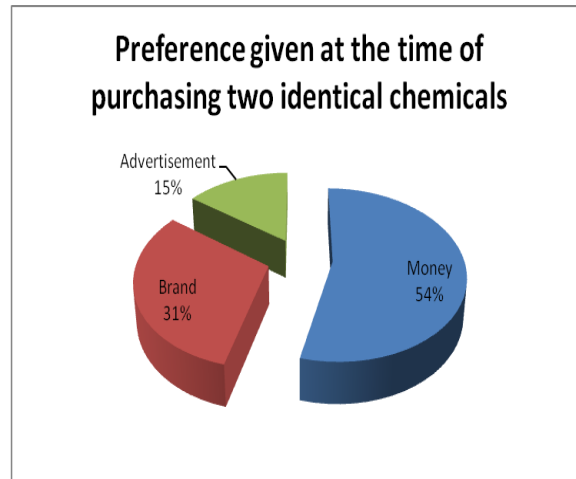


Figure 5-Preferences given by farmers at the time of purchasing two identical chemicals

Analysis: The factor determining the farmer's expectation from the Quality, viz; Brand Name, Money, advertisements. The figure despite the parameters which were rated in order of importance by the customer's choice. It is found that maximum Farmers wants good Quality of Pesticide from company and prefers brand name of company. 54% farmers go for Money and very few farmers i.e. 15% are influenced by advertisements to use pesticide which helps them proper utilization of chemicals in their field. Image if build positively definitely acts to be key factor in propelling the perception.

- 8) Do you buy same chemicals of same company again and again even though new chemicals are in the market? Why?

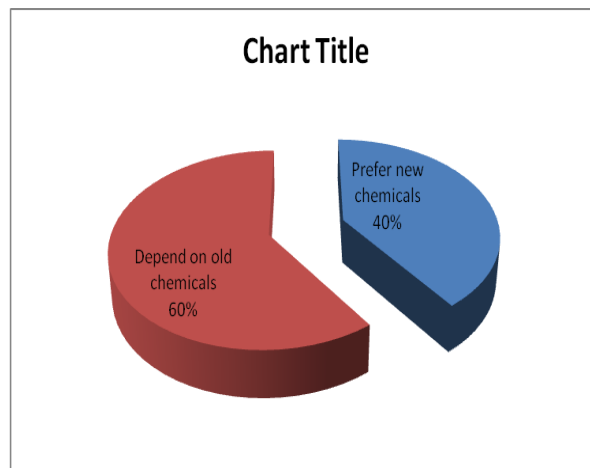


Figure 6-Buying pattern of chemicals

Analysis: When asked to the farmers are they buy same chemicals of same company again and again even though new chemicals are in the market, then it was observed that 40% of farmers prefer new chemicals. And 60% farmers said that it depends upon their experience with old

chemicals. If old ones are giving more productivity then they prefers that only, the experiences prove a major criteria to define the perceptions for purchase of the product

9) Which of the following are the Critical factors in determining your product knowledge?

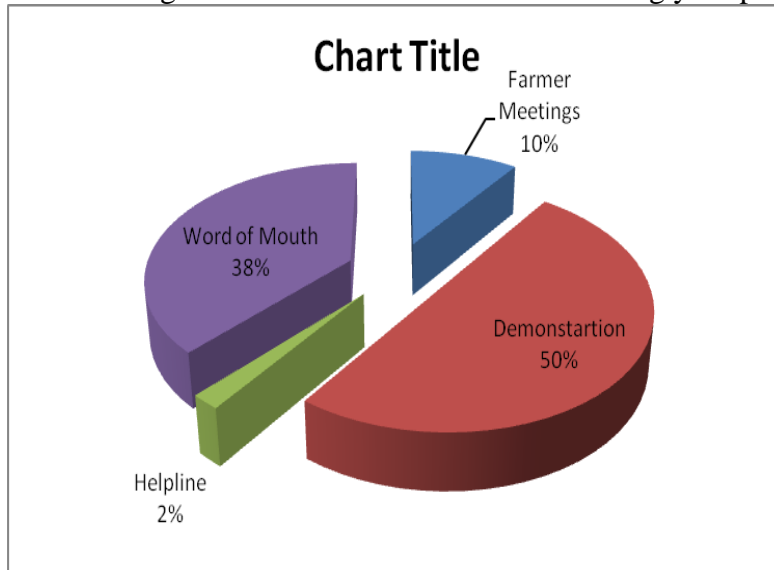


Figure 7-Farmer's expectations in terms of improving their Product knowledge

Analysis: Critical success factors in determining the farmers expectation in terms of improving their Product Knowledge from Help Line, farmer’s Meeting, Demonstration, and seminar. It is found that maximum people wants demonstrations which helps them proper utilization of chemicals in their field. Word of Mouth proves as key influence factor to change the acceptance of innovative chemicals.

10. To increase customer satisfaction for which of the following points you give your preferences?

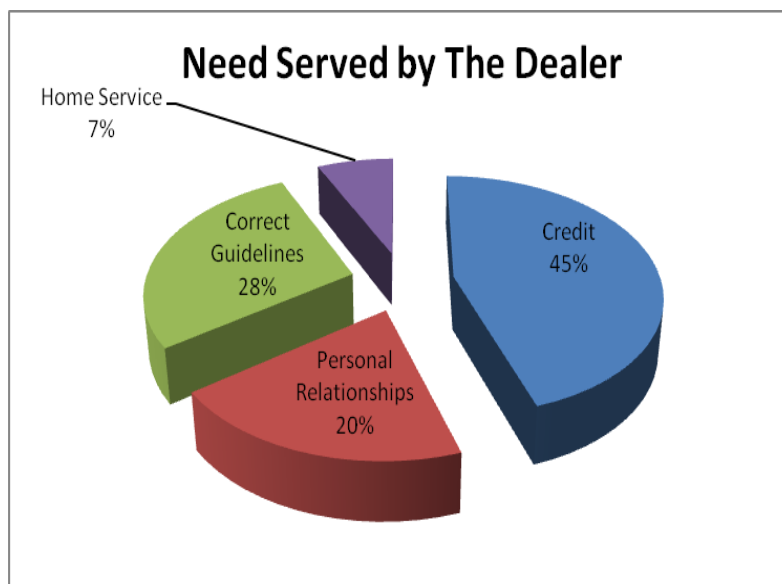


Figure 8-Need served by Dealer

Analysis: The main reason for farmer's adoption of agrochemicals amongst the farmers of is protection of crop. The dealer provides information about the various product offerings, their constituents and benefits; the accessories; and the side effects and results of using such chemicals. They also educate them on the issues of safe usage and disposal. Apart from this, the major role played by the dealer was *facilities of credit* and development of *long term relationships*. The dealers provide credit facilities, often through mutually agreed upon terms and conditions whereby the farmers are allowed to pay in instalments or sometimes even after harvest. The long term relationship that developed between the two, on basis of trust was an important factor affecting both product and store loyalty.

FINDINGS

- Very less number of grape farmers go for intercropping in grapes and no chemicals are used in intercrops , as the major intercrop grown is used as manure for the grapes itself, so all the chemicals purchased were utilised for grapes itself..
- Brand Image plays a key role in acceptance about the products in Agro Industry.
- Distribution channel forms a very important component in passing the info about new technology, new products to the customers.
- Majority of farmers don't purchase immediately the product after its launch which correlates that acceptance of innovation gets a bit delayed in agriculture markets.
- But after the demonstration of new products, if proved successful majority of farmers rush for the purchase of the product.
- The preference is given for money when the time comes to choose two identical chemicals.
- The experience of success of old chemicals proves a major hindrance in acceptance of new innovative chemicals.
- Successful on field demonstrations and word of mouth form major success factors in downloading the innovation to the farmers.
- As agri market is dominated by credit in purchases the need served by dealer is the prime most key factor when purchases are made , possibly farmers end up in buying the products which dealers push, hampering the growth of new molecules .

CONCLUSION

- Farmers have a Strong "propensity to nearness" in buying habits.
- The majority of farmers 'actively compare very few alternative potential sources of supply in selecting a place of purchase.
- The farm market is made up of a heterogeneous group of consumers who base their decision of where to purchase on broad and varied considerations. The rationale for seller "Selection differs from product to product as farmers seek to satisfy their desires.
- Farmers do not necessarily associate the buying of all supplies with a particular place, but instead
- The purchasing decisions for different supplies and services are considered somewhat separately.
- Consumer Perception for acceptance of new Pesticides was quite low as compared to their acceptance traditional Pesticides.

- The Adaption of new technology in Agriculture totally depends on how the companies or the stakeholders educate the farmers of the innovation, or else the traditional products are going to rule the industry.
- Consumers perceive old technology as the key aspect when they decide about purchasing the Agrochemicals as they are not open for easy adaption of new technology.

REFERENCES

- [1] Bharatbook, (2012), *Indian Pesticides Industry*, www.bharatbook.com
- [2] Business Press
- [3] CARE (2012), *Indian Pesticide Industry, CARE Research's Report, 2012*, India.
- [4] Chemical Weekly
- [5] Company websites and Annual Reports FY15: Bayer Crop Science, Rallis India, United
- [6] Phosphorous Limited, Syngenta India Limited, Gharda Chemicals Limited
- [7] *Crop Protection market in India 2008*, Frost & Sullivan.
- [8] *Crop protection Business in the New Decade, 2010 presentation*, Cheminova.
- [9] *Crop life India report on agrochemicals*.
- [10] *IndiaChem2010 Handbook on Indian Chemical Industry*, Tata Strategic & Roland Berger
- [11] KRC Research weekender on Agrochemicals 2014
- [12] *Market Research Reports (2012), Agrochemical Industry in India*, www.marketresearch.com
- [13] Phillips McDougall report on agrochemicals
- [14] Yara Fertilizer handbook