DEMAND AND SUPPLY OF PESTICIDES IN POWAYAN BLOCK OF SHAHJAHANPUR DISTRICT (U.P.)

Project Report

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

Master
of
Agribusiness Management

Supervisor: *Dr. P. K. Singh*

Submitted By: *Amit Kumar*

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CERTIFICATE

To,
The Registrar (Academic)
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Dear Sir,

This is certify that the Project report entitled **"Demand and Supply of Pesticides in Powayan Block of Shahjahanpur District (U.P.)"** submitted in partial fulfillment of the requirement for the degree of **Master of Agri-business Management,** in the Department of Agricultural Economics, Institute of Agricultural Sciences, Banaras Hindu University, is a record of bonafied research carried out by Mr. Amit Kumar, ID. NO. ABM-14213 under the supervision and no part of the project report has been submitted for any other degree or diploma.

I certify that the entire scheme of investigation, presented here in, was planned and carried out solely by the candidate under my guidance. To the best of my knowledge, the data presented in the report are genuine and original.

Thanking you,

Yours Faithfully

Head **Coordinator** **(P.K. Singh)**

(Supervisor)

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Amit Kumar

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I. D. No- ABM-14213 **June-2016** **Enrolment No.364479**

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At the outside, being the student of this great institute, I bow my head with great reverence in the pious feet to the founder of this University, **Mahamana Pandit Madan Mohan Malviyaji**, a man of great vision for creating such a wonderful and unique University, a great temple of learning.

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CHAPTER I

INTRODUCTION

1.1 Background

Pesticides/Crop Protection! Agrochemicals industry plays a crucial role in protecting crops from damage by weeds, pests, insects and fungus, both before and after harvest. Major demand of the pesticides in the country is met from the indigenous production for control of diseases, insect pests and weeds. The production capacity of pesticides in the country is around 1, 39,000 Metric Tons annually with more than 125 technical grade/ manufacturing Units and over 800 formulation Units. In the recent years, the consumption of pesticides has shown a downward trend from 75,000 Metric Tons in 1991-1992 to around 37,959 Metric Tons in 2006-2007 that was due to popularization of Integrated Pest Management approach which includes cultural, physical and mechanical, biological and need based use of safest chemical pesticides including neern based bio-pesticides in harmonized manner as well as use of low dose new molecules ban on the Heptachlor, Chlordane and BHC etc.(Pesticide and Documentation unit, DPPQ and S).

Farmers in many places of Shahjahanpur adjoining district grow all type crops all the year round, rather than just growing them only when their field is empty from wheat and paddy cultivation. Vegetable growing serves a source of income for them as they sell the produce easily in the mandis. To have good value for their produce they need to have a quality and quantity production, as such they go for huge pesticide application in whatever cultivable land they have compare the, different- different company pesticides use. To the effort the focused on the comparative market potential for pesticides in adjoining Shahajahanpur district. Huge pesticide application provides a good market for different types of pesticides. As a result various national and multinational pesticide companies are flourishing day by day, thus the study of the consumption pattern of pesticide becomes relevant.

1.2 Pesticide industry -A Glance

Pesticide industry in India seems to be passing through a financial crisis. The focal causes for this are raising costs of inputs, governmental duties and taxes, and the cost of capital. There are also high rates of excise duty both on intermediates and finished products, and excise and sales taxes account for nearly 20 per cent of the cost of pesticides. The industry is also constrained by regulatory norms. At present, there are high data generation costs for different crops and pests, and the systems and protocols needed for registration of new products are extremely stringent. Export formalities for insecticides and pesticides are particularly of orders and hence, of precious foreign exchange. There are also many spurious producers, who are cheating the Indian farmer at the cost of the plant protection industry. The industry finds it difficult to tackle these, as Insecticide Act of 1968 is not strengthened in spite of several amendments that have been made. For example, there is no provision in the Act to deal with counterfeit pesticides, and the reputable companies, in whose name they are sold, have to prove to the satisfaction of the court that they have not manufactured any sub-standard materials.

However, per hectare consumption of pesticides in India is very low at 0.5 kg, when compared to developed countries, barely above that of Africa. The pattern of pesticide use differs significantly between the countries (F AO, 2005). Since the population in India is growing at a steady rate and the availability of cultivable land is limited, consumption in pesticides is expect to increase in the future, thus offering a good potential for the players both domestic and overseas in coming year.

At present, India is the largest producer of pesticides in Asia and ranks twelfth in the world for the use of pesticides with an annual production of 90,000 tons. A vast majority of the population in India (56.7 per cent) is engaged in agriculture and is therefore exposed to the pesticides used in agriculture.

1.3 Pesticide Market Potential

There is huge potential of pesticide market and consumption in India. Pesticides or crop-protection chemicals are widely used in almost every nation around the world. Their application permits greater yield from farms and assures better storage and distribution for the output. Pesticide production in physical terms is likely to remain constant. Now that we have got a better understanding of pesticides and insecticides, what they refer to and who uses them I would like to look at the risks that can or may result from the use of these chemicals. Naturally the first and most obvious risk that comes to mind is what is to happen to us, humans, when we come in contact with or are exposed to these chemicals. The worldwide consumption of pesticide is about two million tons per year, of which 24 per cent is consumed in the USA alone, 45 per cent in Europe and 25 per cent in the rest of the world. The usage of pesticides in India is only 0.5 kg ha, while in Korea and Japan, it is 6.6 and 12.0 kg ha, respectively. Among the various pesticides used in India, 40 per cent of all the pesticides used belong to organochlroine class of chemical pesticides (FAO, Proceedings of the Asia Regional Workshop Regional Office for Asia and the Pacific, Bangkok 2005).

The key advantage of pesticides is that their use results in far greater agricultural output than would be the case without them. This is especially true for single-specie plantings or mono cultures over vast tracts. The second positive aspect is that pesticides allow for improved storage and distribution of crops; fruits, produce, grains, etc. will stay fresher, last longer, and look better. The pesticide industry is the most dynamic agricultural input industry in India, being substantially in private hands. Yet the pesticide use levels in India are among the lowest in the world. This paper presents an overview-analysis of the pesticide scenario in India. It develops a framework of the market environment within which the growth of pesticide use takes place in developing countries. It then uses this framework to study the growth and patterns of pesticide use in India. It finds that pesticide use in India is highly concentrated by crop and geographic area, and is therefore showing declining growth rates. A major reason appears to be very limited market development efforts by the firms leading to poor conversion of a large potential into effective demand. Output markets/prices, input prices, high yielding varieties and wage rates play important roles in determining use. However, many non-price factors are also very important. Pesticides are also seen as insurance by the farmers as as and therefore higher than optimum use is frequently reported. The new economic environment in India will offer ample opportunities for growth. However, the industry will need to look at the market environment more comprehensively and will need to play a proactive role in market development. Agriculture is the Lynchpin of the Indian economy. Ensuring food security for more than 1 bn Indian population with diminishing cultivable land resource is a herculean task. This necessitates use of high yielding variety of seeds, balance use of fertilizers, judicious use of quality pesticides along with education to farmers and the use of modern farming techniques. It is estimated that India approximately loses 18 per cent of the crop yield valued at Rs.900bn due to pest attack each year (Ministry of Agriculture, report 2011).

1.4 Basic Usage and Types

Pesticides are essential inputs used for increasing agricultural production by preventing loss to crops before harvesting or post harvesting. The different types of pesticides arc Insecticides, Fungicides, Herbicides, Rodenticides, Nemanticides etc. and are derived from chemicals. Pesticides can be classified into two type namely technical grades and formulations. Technical grades exist at the first stage of manufacturing process and generally consist of highly toxic and hazardous liquids. They're in technical parlance defined as products with high chemical purity. Whereas further processing of technical with emulsifiers and other agents (sometimes referred to as excipients) result in next stage namely formulations. Formulations are tailor-made for diverse applications en insect-pest spectra, plant diseases, weeds etc.

1.5 Demand & Supply Scenario

In 1992, the government formulated the law, which made it obligatory for manufacturers of basic bulk agrochemicals, popularly called technical's, to sell 50% of their output to' the outside formulation manufacturers. After the law was repealed these formulators found starved of raw materials, so many of them began producing technical's on their own. As a result the number of these small manufacturers went up from 300 in 1992 to more than 500 in 1998. Today's glut is a result of that capacity addition. Over capacities and strong competitive pressures within this sector have affected profit margins of the players in this industry. Most of the manufacturers have achieved an average capacity utilization of 65 per cent to 70 per cent. While supply has expanded, demand has not kept pace as it has been hurt by the climatic factors. The erratic monsoon trends further affected the crop production in the Kharif season resulting in lower off take for the pesticides. Small players panicked when the demand did not pick up and went for distress sales, which further brought down the prices.

1.6 Snapshot of the Agrochemical Sector

Table 1.1 State wise Demand of Pesticides (MT)

S.N.	States/ UTs	2007-08	2008-09	2009-10	2010-11	2011-12
1.	Andhra Pradesh	3600	2045	2045	1500	1300
2.	Assam	215	205	195	190	186
3.	Arunachal Pradesh	17	17	17	17	4
4.	Bihar	975	930	925	935	960

5.	Chhattisgarh	450	704	535	535	570
6.	Goa	5	5	5	5	7
7.	Gujarat	4200	4550	3400	3000	2750
8.	Haryana	4732	4700	4500	4650	4550
9.	Himachal Pradesh	470	332	340	297	288
10.	Jammu Kashmir	110	101	28	1154	26
11.	Jharkhand	180	60	55	85	72
12.	Kamataka	2600	2400	2400	2200	1975
13.	Kerala	1690	346	454	368	364
14.	Madhya Pradesh	938	921	880	939	961
15.	Maharashtra	3500	3300	3200	3188	3200
16.	Manipur	27	29	32	33	33
17.	Meghalaya	7	7	9	100	10.328
18.	Mizoram	20	20	46	61	55
19.	Nagaland	7	7	7	7	7
20.	Orissa	1131	1131	1131	1131	1155
21.	Punjab	7100	7000	7050	6550	6550
22.	Rajasthan	3175	3150	3250	3250	3050
23.	Sikkim	4	4	NIL	NIL	1
24.	Tamil Nadu	2564	2619	2634	1369	2182
25.	Tripura	18	18	28	25	17
26.	Uttar Pradesh	6750	6725	6700	6675	7075
27.	Uttaranchal	131	179	147	150	159
28.	West Bengal	4000	3800	4200	4400	4400
29.	A&N Islands	3	9	9	9	19
30.	Chandigarh	1	0.75	0.75	0.75	N/A
31.	Delhi	55	50	50	33	50
32.	Dadra & Nagar Haveli	6	6	6	6	N/A
33.	Daman&Diu	1	1	1	1	N/A
34.	Lakshadweep	2	2	2	2	N/A
35.	Pondicherry	52	38	42	42	41
	Total	48,736	45,412	44,324	43,718	42017

Source: Pesticide and Documentation Unit, DPPQ and S

1.7 Production of Pesticides in the Country

Domestic agrochemical industry has about 80 players in the organized sector and more than 500 players in the small-scale sector. More than 60 technical grade pesticides are manufactured indigenously by 125 producers while 500 units are engaged in making pesticides formulations. Manufacturers in the organized sector are producers of the basic technical grade, which is used by small-scale formulators to manufacture pesticides. The penetration levels for pesticides are very low in most parts of the country except certain states like Andhra Pradesh and Karnataka where the consumption is high due to higher composition of cash crops. India is a dominant producer of isoproturon - a weedicide and accounts for nearly 25% of the worldwide production. Besides synthetic pyrethroids, such as fenvalerate, cypermethrin, endosulphane, and a wide range of organo-phosphates like Monocrotophos are also manufactured in India.

Table 1.4: The Product Brands as Available in the Market

TRADE NAME	Active Ingredients
ANANT	Thiamethoxam 25WG
ASATAF	Acephate 75SP
ATRATAF	Atrazine 50WP
DLITOX	Copper Oxy chloride 50W
DROMODIOLONE	Bromodiolone
CAPTAF	Captan 50WP
CARTAP	Cartap Hydrochloride 50SP
CRYSTAL	Captan 50WG
CARTOX	Cartap Hydrochloride 4G
CONTOF	Hexaconazole 5E
ENDOTAF	Endosulphan 35E
FATHEH	Sulfosulfuran 75WG
FUnONE	Isoprothilone 40E
FURADAN	Carbofuran 3G
FURATAF	Carbofuran 5G
GLAZER	Metalaxy135WS
KORANDA	505 CPP + Cypennethrin
MANIK	Acetamiprid 20 SP
MASTER	Mancozeb + Metalaxyl 72
NAGATA	Ethion + Cyper 45 EC

PRABAL	Profenofos 50 EC
PREET	Pretilachlor 50 EC
QUINALTAF	Quinalfos 25E
RALO	Cypennethrin 10
RALWIN	BPMC 50EC
REEVA	Lamda Cyhalothrin 2.SEC
REEVA	Lamda Cyhalothrin 5EC
ROGOR	Dimethoate 30EC
SAMARTH	Hexa 2 SC
SARTAJ	Clodinafop propargyl 15 WP
SENTRY	Lamda Cyhalothrin 10WP
SPIRO	Thiodicarp 75WP
SULTAF	Sulfur 80W
TAFABAN	Chloropyrifos 20E
TAFETHION	Ethion 50E
TATAALPHA	Alfacypermethrin 10E
TATACYPER	Cypermethrin 10E
TATACYPER	Cypermethrin 25E
TATAFURAN	Carbofuran
TATA~TRI	Metribuzin 70W
TATAM45	Mancozeb
TATAMONO	Monocrotophos 36SL
TATAPANIDA	Pendimethalin 30EC
TA TAF EN	Fenvalerate 20E
TATAMIDA	Imidacloprid 17.8SL
TATAMIDA	Imidacloprid 70WS
TEER	Butachlor 50 EC
TERMEX	Imidacloprid 30.5 SC
TRITOX	Tryazophos 40 EC

VOLPHOR	Phorate 10 G
ZOLONE	Phosalone 35 EC

1.8 Keeping in view the above aspect following objectives were under taken for the study.

I. To work out demand and supply of pesticides in study area.
II. To study the market share of different companies in the study area.
III. To study the purchasing behavior of the consumers.

1.9 Limitations of Study

As the project was concerned with the farmers and retailers following problems were faced.

- Retailers were not ready to share the information in the correct form and duplicity appeared while providing the fact on pesticide related issues.
- Money was also considered to be as constraint for the collection of data with the investigator.
- Availability of farmers for getting information was also limited as they were either available in early morning or late afternoon & evening .In between they were in mandis to sell their produce thus time constrain was there in locating and interviewing them.
- Retailer's seldom shared all the information and recommended other retailer whom the same thus times took to take the retailers in confidence.
- Secondary data were available in the scattered manner as such problem aroused in summarization of data.

REVIEW OF LITERATURE

The Review of literature guides the research workers in their research investigation. Therefore, it is essential to go through the research work related to the present research problem. A brief review of research work is presented in this chapter.

Peric *el al.* (2010) described that market provides numerous innovations in the context of existing global and local contents, which do not appear in the form of trends but rather as new values and attitudes. Due to the competition of the same type of shops that mostly offer the same or similar goods at approximately the same price, factors such as the shop layout and sales staff are increasingly influencing the choice of point of sale and purchase. It defines how the customers/consumers assessed the place for buying furniture. The Customers were satisfied with the location, range of products and with information about products received by the staff in sales centers. They were somewhat less satisfied with the treatment of sales center staff and appearance of sales centers. They expressed the least satisfaction with the price and payment conditions.

Oblak *et al.* (2009) reveal understanding of purchase behavior and consumer decision making is of crucial importance for each company. Only on this basis, company can develop a marketing mix of products and services that will serve the needs and desires of customers. The process of purchase decision making takes place in five steps: problem recognition, information search, alternative evaluation, purchase decision and post-purchase behavior. The company must determine what the behavior of customers in each of these levels, as well as factors which may affect them at each stage. In the study, we observed the effects of the purchase decision when buying furniture.

Ganguli (2008) stated instead of creating an artificial need or demand, the marketer are, in fact, concentrating on creation of brands that fit into customer's real lives.

Zhifeng *et al.* (2007) find the key factors of web site which influence customer value. Through literature review, we find the role of web site from a marketing perspective is a medium of marketing, enhancing the marketing mix and endowing the marketing mix with new features; we also find that customer value is a comparison of benefit and cost, having both psychic value and utility value and covering the whole customer activity. On base of these, we identify eight factors of web site which, we hypothesize, influence customer value: Attractiveness, Ease of use, Accuracy, Customization, Responsiveness, Community, Comparison and Assurance. Then a survey with questionnaire method was employed. As to the design and analysis of the questionnaire, the Kano model was used. The result of our survey showed that seven factors of web site - Assurance, Ease of use, Accuracy, Responsiveness, Customization, Attractiveness and Comparison, have positive influence to customer value while Factor of Community, has little influence to customer value.

Phil (2006) stated that World use of pesticides in 1999 was an estimated $28 billion at the user level, an increase of 1 per cent from 1994. The market for herbicide-tolerant and insect-tolerant crops expanded to over $2 billion in 1999, representing a total crop protection market of over $30 billion. This increase was mainly a result of market expansions in the United States, Europe, parts of Asia, and Latin America. By 2004, world pesticide sales will decline to $27 billion annually. This represents a real decline in worldwide use of pesticides (in terms of 1999 dollars) at an average rate of 1 per cent per year. The decline in pesticide usage will likely be offset by increases in pest- and pesticide-tolerant crops. The 1999 sales of pesticides are estimated at 2 million metric tons active ingredient, including user-level sales and exports. Volumes are expected to decrease about 1.0-1.5 per cent per year to 2004, while inflation and higher-unit-value products could add a 2-3 per cent rate of growth per year to the dollar value of the industry over this period. With the greatest sales volume and total sales values, the herbicides sector is the leader in U.S. pesticide sales. Because planted crops and treated acres have not grown substantially in the last few years, retail price competition continues at a high level. The introduction of herbicide-tolerant crops has resulted in a significant change in the mix of herbicide products used by fanners. This has pressured margins at all levels in the distribution chain as manufacturers are pursuing market share strategies more strongly in the contracted major markets. Exports are a major factor in the market for U.S.-produced pesticides, with the 1999 volume reaching an estimated 310 thousand metric tons of active ingredient. Non-U.S. markets currently represent about 30 per cent of total U.S. pesticide production. Imports in 1999 amounted to 82 thousand metric tons of active ingredient.

Kothari (2006) stated that instead of creating an artificial need or demand, the marketer are, in fact, concentrating on creation of brands that fit into customer's real lives.

Kottler (2006) described that positioning means creating a space in the customer's mind. Marketing is a continuous process of value creation, value communication, value delivery and brand positioning. Brand positioning helps marketer in building the marketing mix for each segment.

Hicks *et al.* (2006) stated the Industries, products and strategies of the global generic Pesticides industry. Generic pesticides Industries are of greatest importance in emerging markets, accounting for more than 60 per cent of the total Pesticides market in China, but only around 10 per cent in Germany, Canada and USA. The report analyses the most important national markets for generic pesticides (including Argentina, China, France, Germany, India, Italy, Japan, Korea, Spain, Taiwan, UK and USA), presenting profiles of the leading Industries and market share tables. The report presents rankings for the top 20 Pesticides Industries and the 14 largest generics Industries and lists the leading generic herbicides, plant growth regulators, fungicides and insecticides and their estimated annual sales at user level in volume and value terms. Recent additions to the ranges of generic pesticide Industries arc listed by company, as well as the future product plans of the leading producers. Active ingredients that will come on' patent in the near future are identified through lists of the herbicides, fungicides and insecticides that were reported and commercialised in the 1980s. Three chapters discuss the origins of generic pesticide Industries, the business strategies adopted by leading Research and Development-based crop protection Industries and the role of special interest groups such as the European Crop Protection Association (which includes Research, Development and generic Industries) and the European Crop Care Association (ECCA). The latter represents the interests of generic Industries and is particularly concerned with the EU's pesticide re-registration process and the sharing of the costs thereof. Patent protection is a key issue for the generics industry and the report discusses the use of new formulations and production technologies to gain competitive advantage. Strategies available to generic pesticide Industries include those used by governments to stimulate their domestic industries (such as tariff barriers to trade and less strict patent protection), and those adopted by the Industries themselves. These include leveraging manufacturing strengths, contract manufacturing and licensing agreements with Research and Development Industries. To counter these strategies, Research and Development Industries have used a number of approaches including reducing prices, mixing active ingredients with products still protected by patent to give an improved spectrum of activity, and controlling the supply of raw materials and key intermediates. Acquisitions, joint ventures and a range of co-operation agreements between Research, Development and generic Industries are also increasingly common. The recent round of mergers and acquisitions activity between leading Research and Development Industries has also led to opportunities for generics Industries due to the sale of some active ingredients that has been enforced by competition authorities. The final chapter in the report reviews the role of generic pesticide trading Industries. However, this is diminishing as many producers set up their own distribution networks. This is particularly true of China.

Hundal *et al.* (2006) revealed that India ranks 10th in the world in pesticide consumption as its total consumption amounts to about 500 million tones. India is presently the largest manufacturer of basic pesticides among the South Asian and African countries, with the exception of Japan. The Indian pesticides market is the 12th largest in the world with a value of US$0.6 bn, which is 1.6 per cent of the global market pie. India is one of the most dynamic generic pesticide industries in the world, having a total installed capacity of technical grade pesticides consisting of large and medium scale and 400 pesticide formulators (of all sectors) spread all over the country for use in agriculture, public health, household and plant protection. Overall, it can be said that there is a bright future for Pesticides Industries in India in the post patent era. This paper focuses on the opportunities arising for Industries dealing in pesticides because of the agrarian nature of the Indian economy. Besides, it presents a conceptual framework of the situation prevailing in the marketing of pesticides in India with special reference to Punjab.

Banumathy and Hemameena (2006) in their market research concluded that brand preferences among the consumers may be related to different factors like personal attributes age, educational qualifications, occupational status, monthly income etc.

Benjamin *et al.* (2006) studied that "Market Share Liability Shouldn't Die: Proposed Application to Agricultural Pesticides and the Need to Refine the Apportionment of

Liability." My thesis is: Courts have, been reluctant to extend market share liability beyond injuries derived from DES drug exposure, due to the lack of uniformity in the products. The jurisprudence of market share liability ought to be extended to include injuries derived from agricultural pesticides. These pesticides are sufficiently similar and create exposure settings in which a plaintiff's only theory of recovery may be that of market share liability. In applying market share liability, the courts' analysis has been inconsistent with the theory's original intent. By enhancing their market share jurisprudence with my proposed profit share factoring, the court will achieve the goal of focusing on the party who can best absorb the cost of the plaintiff's injury. Courts have struggled with the definition and application of market share liability, often coming to diametrically opposing outcomes. A profit share factoring component would equalize these jurisdictional swings, rendering more fair and just outcomes. Under a profit share factoring analysis, market share percentage would be used as a baseline with the ability to adjust liability up or down according to a defendant's profits gained from the product. Any party to the action can seek adjustment, but the adjustment must be supported by evidence based on their profit margins from the injurious product.

Reddy and Shivkumar (2005) defined market potential as the maximum demand response possible for a given product or service over a specified period of time under well defined completive and environmental conditions.

Kessuda (2005) studied the marketing communication strategic of sales promotion for the rice-pesticide substances in Singburi province, the behaviors in exposing to information of the farmers in Singburi, and the motives in buying rice-pesticide substances of the farmers in Singburi. Data collection was done by interviewing four sample groups they are sales-promotion policy makers, salespersons or marketing communication officers of 3 manufacturing, distributing Industries and 12 selling agents of rice-pesticide in the province. It was focus groups and questionnaires of 60 farmers were also carried out. The study found that the manufacturing and distributing Industries had sales promotion that directed at the merchant middlemen. The favorite techniques were product education, special discounts, touring incentives, bonus in fonns of gold moments or electric appliances. They also use joint special promotional activities with selling stores, such as meetings, point-of-purchase displays, and etc. The most communication channels were personal contacts through popular salespersons or Marketing communication officers. The preferred sales promotion techniques directed at consumers were product education, demonstration fields, free gifts, meeting arrangements along with special priced sales, and lucky draws. These were made through personal communication channels like salespersons and/or marketing communication o11icers, including selling agents.

Srivastava (2001) reported that the growth of the pesticides industry, changes in the product mix, market concentration, flow of materials, problems of various constituents and the emerging marketing scenario. The Pesticides Industry has grown by 7.6 per cent during the last 20 years. It has also undergone structural changes from low value products to high value specialty products. The use of pesticides is concentrated in selected districts of a few states like Andhra Pradesh, Karnataka, Gujarat and Punjab. It was observed that bulks of the pesticides used in agriculture were accounted for by crops like cotton and paddy. The major constituents of pesticides industry are technical grade material manufacturers, formulators and dealers. About 84.5 per cent of the total production of technical pesticides is concentrated with 16 Industries only. Of these 16 Industries, 13 have the bulk of the market share of the products group dealt by them. There is vast scope for accelerating consumption of pesticides by diversifying to hitherto untapped regions and crops. This calls for a major market developments effort on the part of industry. The industry is presently dependent on distributors and dealers to push their products. The industry will have to generate guidelines for economical use of pesticides to crops grown in disadvantaged regions.

Luch and Ronald (1999) defined market potential as the maximum demand response possible for a given product or service over a specified period of time under well defined completive and environmental conditions.

Gupta (1999) in her market research concluded that brand preferences among the consumers may be related to different factors like personal attributes, age, educational qualifications, occupational status, monthly income etc.

RESEARCH METHODOLOGY

3.0 Background

This chapter deals with the research methodology adopted for achieving the objectives of the study.

3.1 Selection of the District and block

The district Shahjahanpur and block Powayan was selected purposively where fruits and vegetable crops are grown all the year round. The districts include eleven blocks (Banda, Khutar, Powayan, Sindhauli, Katra, Jaitipur, Tilhar, Nigohi, Kanth, Dadrol, Bhawalkhera, and Madnapur blocks). Crops are highly susceptible to insect, pest and diseases for which pesticides are required on larger basis, thus the research brings about a look at the pesticide consumption in districts though a generalized view for the country can't be drawn, since it is one of the biggest and most populous districts and block in a Uttar Pradesh (Census 2014).

3.2 Collection of Data

Both primary and secondary data were collected for the accomplishment of the study.

3.2.1 Primary data

The primary data were collected for the retailers and farmers in the selected district of Shahjahanpur and block powayan. The methodology for the collection of primary data involved schedules through pre decided questionnaires and open ended discussions at all the levels of retailer and farmers.

3.2.2 Secondary data

The secondary data sources included the web portals, and different magazines and journals related with Agro Chemical Business and reports/data available with the department or University and with District Marketing Officers (DMO) of Shahjahanpur.

3.3 Research Instrument

Separate pre-structured questionnaire were prepared for retailer and farmers consisting of both closed-ended and open-ended questions.

3.4 Sampling

Sampling unit would consist of retailer of all companies and fanners.

Sample unit-

Table 3.1: Sample size

Block	Powayan
Number of retailer	10
Number of farmer	50
Total	60

3.5 Sampling Procedure

Various market of Powayan covering one block, which covered about 45 percent area in Powayan block, from each block ten major retailers were selected randomly of Cristal, Tata Rallis and other companies, 50 farmers were selected randomly from powayan block. Every day one retailers and five farmers were interviewed; Survey work was conducted for 10 days covering 1 block with sample size of 10 retailers and 50 farmers.

3.6 Analytical Tool

The data collected are summarized in tabular form so that it becomes relevant to the various objectives of the study. The data, thus collected are analyzed by simple tabular method. Thus, the entire information is such a way as to provide a base for subsequent analysis and interpretation of the findings. The project was carried out to fulfill the specified objectives of the study. The procedure adopted is presented objective wise as follows:

3.6.1 To analysis the market shares of different companies in Powayan block.

The primary as well as secondary data was used in finding out major players of pesticides in Powayan. Secondary information was collected from District Marketing Officer (DMO), Shahjahanpur.

3.6.2 Demand and supply of pesticides in study area.

The market size of agrochemicals used estimated by using both primary as well as secondary data, which also helped in finding out major molecule and their market leaders. The trend was analyzed with the help of primary data; this information was collected from farmer and retailer with the help of both close ended and open ended questionnaire and interview schedule.

3.6.3 To study the purchasing behavior of the consumers.

Primary as well as secondary data was used in finding out consumer behavior for pesticides, interview of farmers; retailers were conducted for the major molecules, their effectiveness, various promotional activities conducted by companies, which helped in brand positioning and identification of new molecular.

CHAPTER IV

PROFILE OF THE STUDY AREA

4.0 Background

This chapter is devoted for presentation and discussion of the agro economic feature of the area under study. In this chapter, a general background about the district of Shahjahanpur block powayan has been dealt in detail.

4.1 District at a glance

Shahjahanpur district is one of the historical districts of Uttar_Pradesh in the republic of India. It is a part of Bareilly_division which is situated in south-east of Rohilkhand division. It was established in 1813 by the British_Government. Previously it was a part of district Bareilly. Geographically the main town is Shahjahanpur city which is its headquarters. Its Tehsils are: Powayan, Tilhar, Jalalabad, and Sadar.

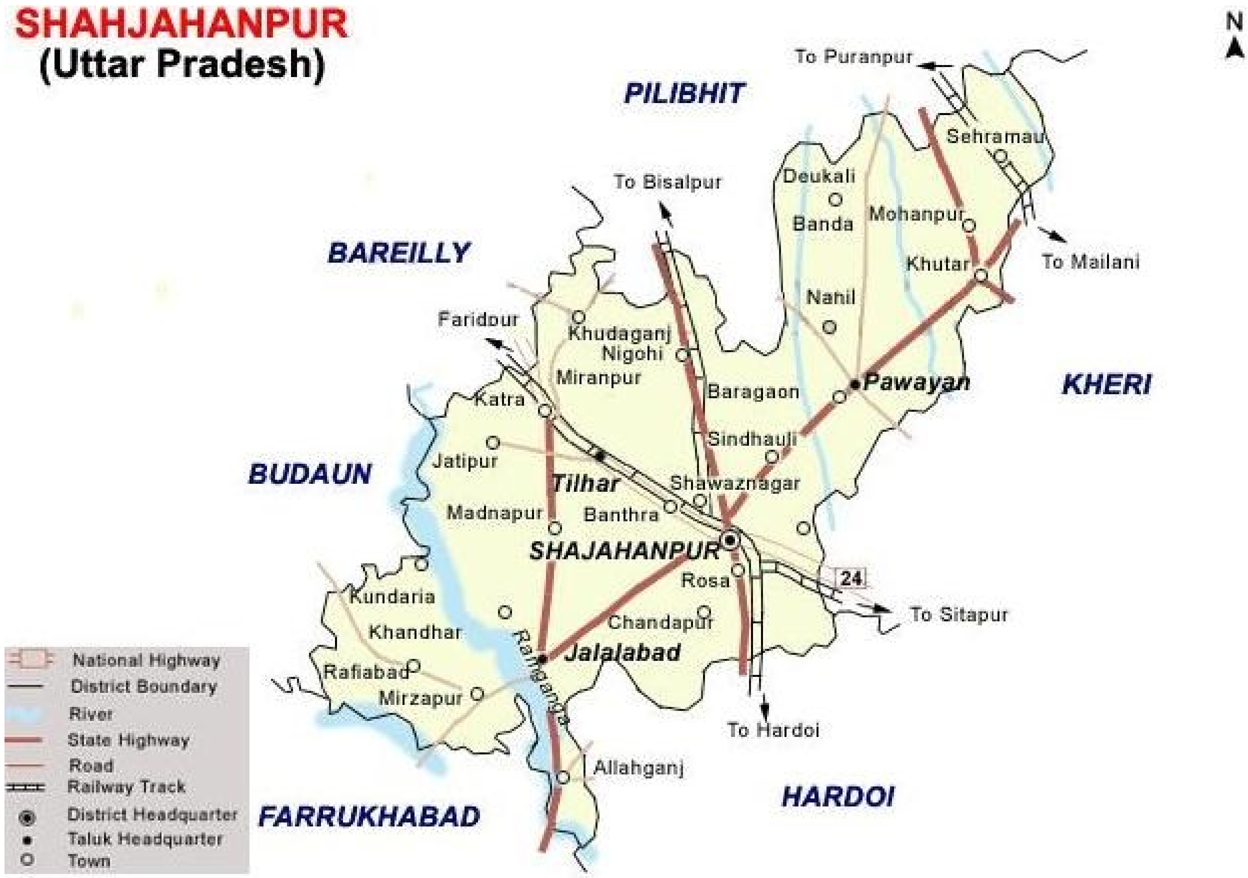
District Shahjahanpur is situated in South East of Rohilkhand Division. It was established in 1813.Before its creation it was a part of district Bareilly. Geographically, it is situated at 27.35 N Latitude and 79.37 E longitudes. Adjoining districts of the Shahjahanpur are Lakhimpur Khiri, Hardoi, Farrukhabad, Bareilly; Budaun & Pilibhit. Geographical Area of it is 4575 Sq. Kilometer. This is an Agriculture based District of Uttar Pradesh. Ramganga, Garrah & Gomti are the main rivers of district. Kathana, Jhukma & Mensiare are the attached rivers of Gomti. Garrah is the main river. Khannaut, Suketa and Kai are the attached rivers of Garrah. Flood - mostly affects Jalalabad Tehsil. Major crops of the district are Wheat, Gram, and Millet & Potato.

4.3 Drainage

Natural drainage is provided by river Gomti, Garrah, and Suketa are regular flowing rivers of the district.

4.4 Topography

The Gomti, Garrah, and Sukheta rivers, the chief geographical feature, Land of district Shahjahanpur is plains and fertile. Land of district Shahjahanpur on the side of the river bank is low and other side it is comparatively high side of land is called Bangar and low side is called khadar. The north side land of tehsil Powayan as is domat land. Land in the west side of the district is comparatively very low due to land erosion of the rivers. Due to this reason at the time of rainfall the area become flooded. In the Block Kaur, Khutar, Nigohi & Jaitpur land is domat and matiyar. In the district water level is 20’ to 25’ be



The district Shahjahanpur is divided into eleven development block namely- Banda, Khutar, Powayan, Sindhauli, Katra, Jaitipur, Tilhar, Nigohi, Kanth, Dadrol, Bhawalkhera and Madnapur.

4.5 Climate

Pawayan's climate is classified as warm and temperate. In winter, there is much less rainfall than in summer. This climate is considered to be Cwa according to the Köppen-Geiger climate classification. In Pawayan, the average annual temperature is 24.9 °C. In a year, the average rainfall is 1236 mm. The temperatures are highest on average in May, at around 32.2 °C. In January, the average temperature is 15.3 °C. It is the lowest average temperature of the whole year. The variation in the precipitation between the driest and wettest months is 401 mm. The average temperatures vary during the year by 16.9 °C.

4.6 Density of population

The initial provisional data released by census India 2011, shows that density of Shahjahanpur district for 2011 is 685 people per sq. km. In 2001, Shahjahanpur district density was at 571 people per sq. km. Shahjahanpur district administers 4,388 square kilometers of areas.

Table 4.1: Density of population

Particulars	Area (sq.km.)	Population	Density of population per sq.km.
India	3,287,240	1,220,200,000	436
U.P.	240,928	199,812,341	828
Shahjahanpur	4,388	3,006,538	685

Source: Census 2014

4.7: Land Utilization of area

The table 4.2 clearly shows of the total geographic area, land use other then agriculture occupies highest percentage followed by Forest. Land utilization for agriculture is very low.

Table 4.2: Land Utilization of the district Shahjahanpur

S.No.	Particular	Area (ha)
1.	Total area	437649
2	Forest	10498
3	Non Agriculture land	5110
4	Cultivated land	3572

4.8: Cropping pattern on study area

The table 4.3 reveals that cultivation label of Shahjahanpur. Wheat and paddy is the major crop followed by Maize and Mustard .Wheat is staple crop of Powayan block in Shahjahanpur district.

Table 4.3: Area under the different crops in block Powayan of shahjahanpur District.

S. No.	Particular	Area (ha)
1.	Rice	162992
2.	Wheat	253928
3.	Sugarcane	49860
4.	Sesame	7208
5.	Sorghum	2691
6.	Pearl millet	4722
7.	Maize	1507
8.	Black gram	9267
9.	Groundnut	6619
10.	Pigeon pea	22675
11.	Barley	3295
12.	Mustard	14219
13.	Toria	23994
14.	Chickpea	2384
15.	Len Sesame	26393
16.	**Total**	**592754**

4.9 Cropping Intensity of Tract

The table clearly represents the intensity of cropping and net sown area.

Table-4.4: Cropping intensity of District Shahjahanpur

S.NO.	Particular	Area (ha)
1.	Net Sown Area	**349958**
2.	Area sown more than once	**262600**
3.	Total Cropped Area	**61258**
4.	Intensity of Cropping (%)	**175.04%**

RESULTS AND DISCUSSION

5.1 Analysis of Market Share of the Companies

The table 5.1 shows that the 18 per cent share of pesticide market in block Powayan of district Shahjahanpur is covered by FMC, Cristal and Northern same 14 per cent, Tata Rallis, Bayer and Syngenta is 11 per cent each, Monsanto 9 per cent and Krishi Rasayan covered 7 per cent market of pesticide.

Table 5.1 Pesticide Market Potential in District Shahjahanpur

S.N.	Company Name	Sales Revenue (Yearly in Rs.)	Percentage
1.	FMC	4 Crore	18.09
2.	Cristal	3 Crore	13.57
3.	Northern	3 Crore	13.57
4.	Tata Rallis	2.5 Crore	11.31
5.	Bayer	2.5 Crore	11.31
6.	Syngenta	2.5 Crore	11.31
7.	Monsento	2 Crore	9.04
8.	Krishi Rasayan	1.5 Crore	6.78
9.	Excel Crop	1.1 Crore	4.97

(Source: District Marketing Officer (DMO), Shahjahanpur

5.2 Farmer Profile

The fanner profile includes age group, Qualification, Land holding, Family pattern, Source of information of Fanners.

5.2.1 Age group of farmer (year)

The figure 5.1 shows that respondents belong to three age group however the above result clearly indicate that majority of respondent belong to middle and old age group.

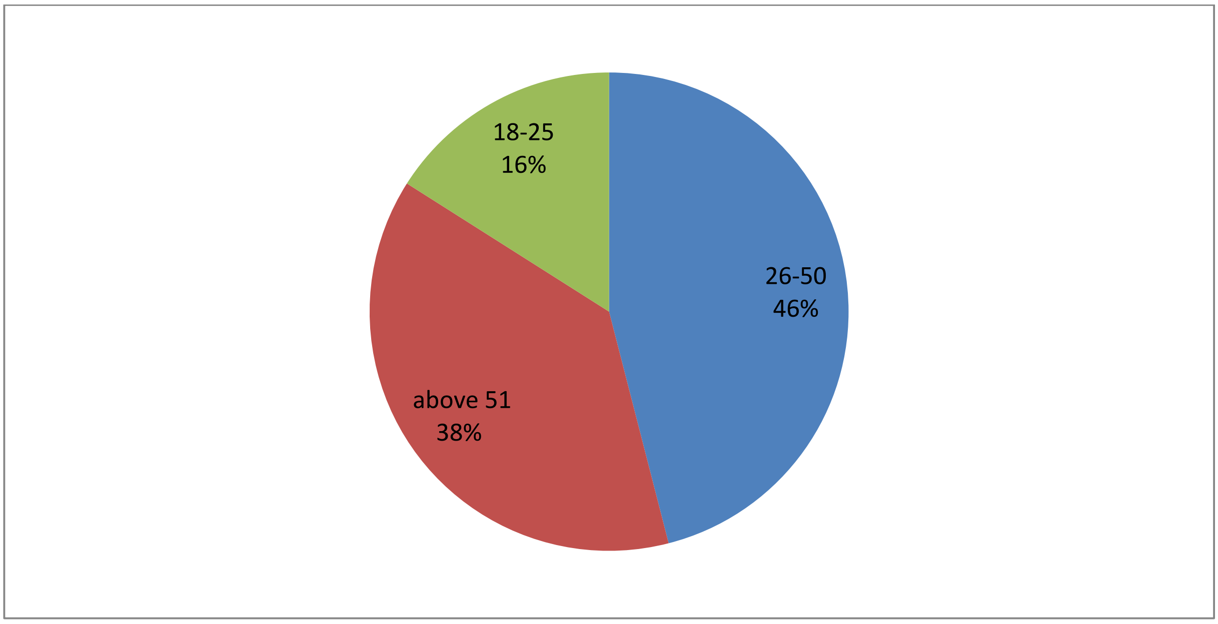


Fig. 5.1: Age group of respondent farmer

5.2.2: Qualification of farmer

The figure 5.2 indicate that respondent were found illiterate to literate hence that information system should be in such a way that every farmer able to understand.

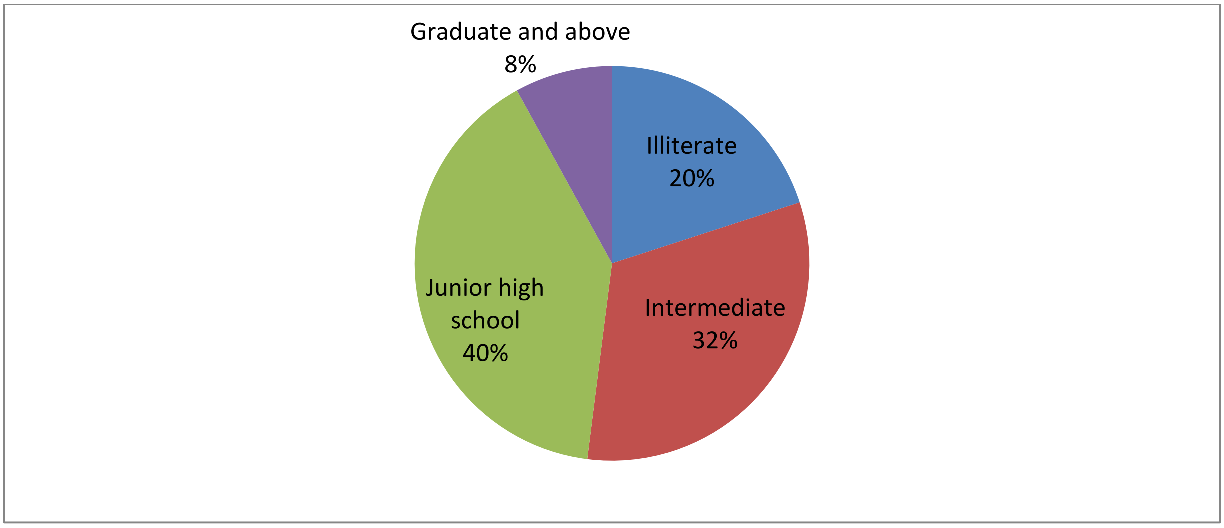


Fig. 5.2: Qualification of farmer

5.2.3: Land holding of farmer

Figure 5.3 revealed that 44 per cent respondent were marginal farmer 20 per cent respondent were small farmer and 36 per cent large farmer. Thus it is clear from above result that the maximum respondents fall under the category of marginal & small farm holding.

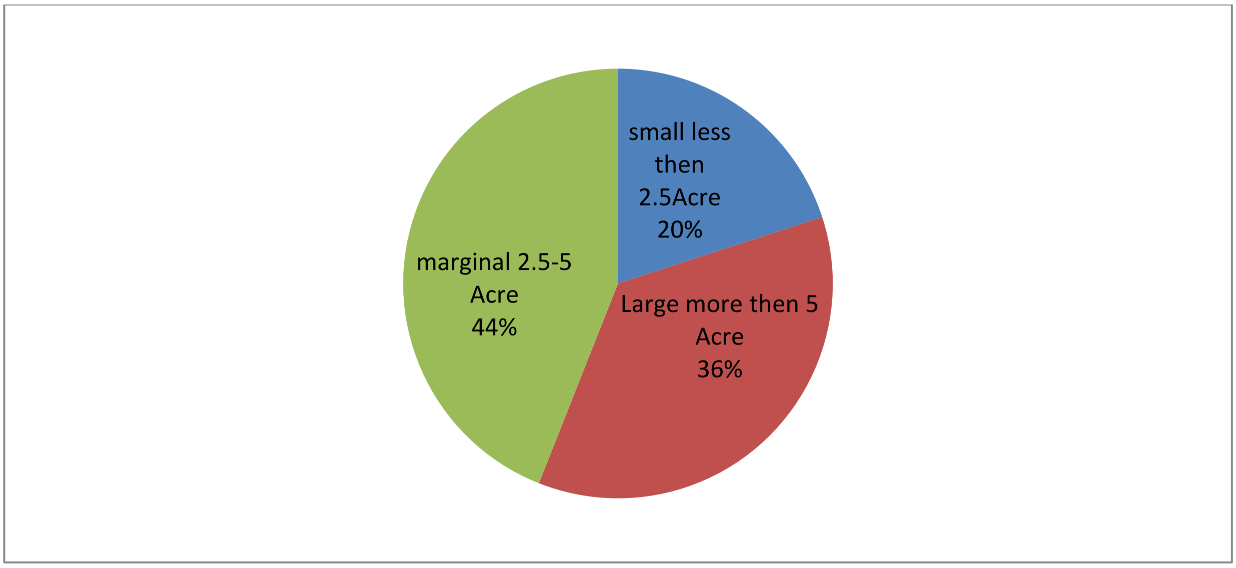


Fig.5.3: Land Holding of Farmer

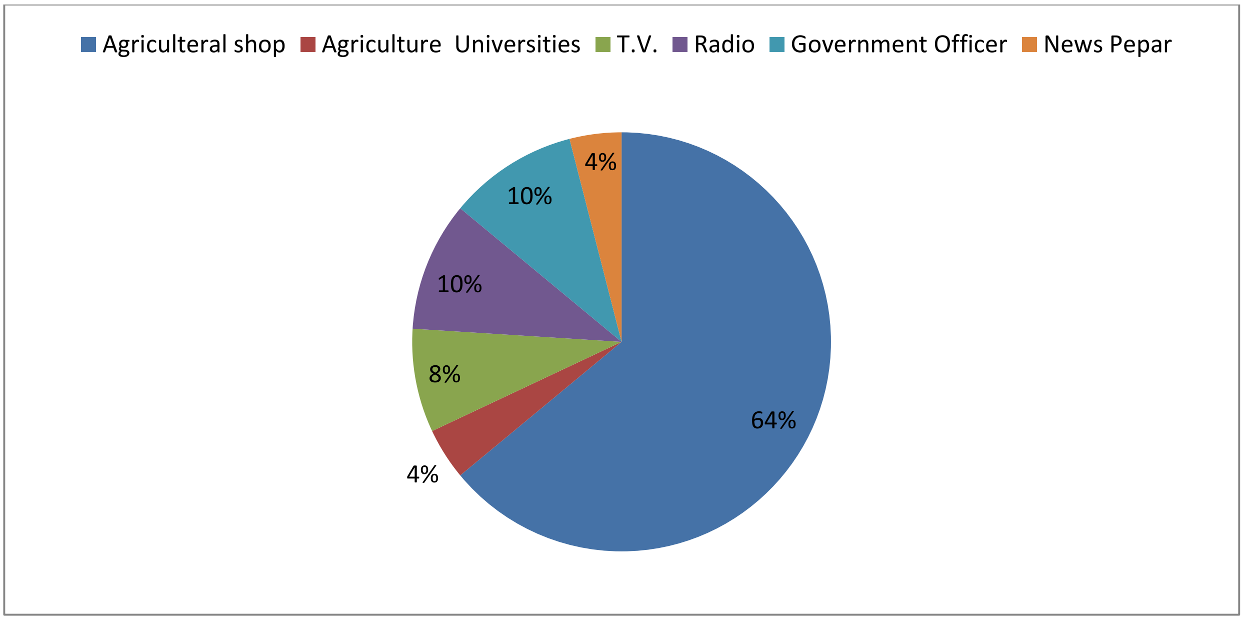


Fig.5.4: Source of Information

5.3 Customers purchasing behavior

Critical success factors in determine the choice of the product. Brand was identified company name, farmers' recommendations, dealer's recommendations, launch of new chemicals and trial pack result.

It was observed that 71 per cent of farmers were knowledgeable and actually purchase the pesticide based on the technical compounds rather than on the company name and the image.

As well as source of information is concerned, 61 per cent of the fanner took advice from the dealers. 95 per cent filled the product literature for future reference, and 15 per cent of farmer was watch agricultural program me like krishi Darshan on Doordarsan. The farmer also rely on local newspaper and agricultural trade journals for information,

5.3.1 Extension Programs followed by various pesticide companies

The survey revealed that pesticide companies followed the same and common medium of promotion that include Kisan Goshti, retailer & dealers meeting, field surveys etc. Very few companies have adopted new means like Chambal has adopted to make fanners member and giving them benefits. A key note "vas that maximum new companies follows the extension work regularly so as to have a base while established one rarely do extension works.

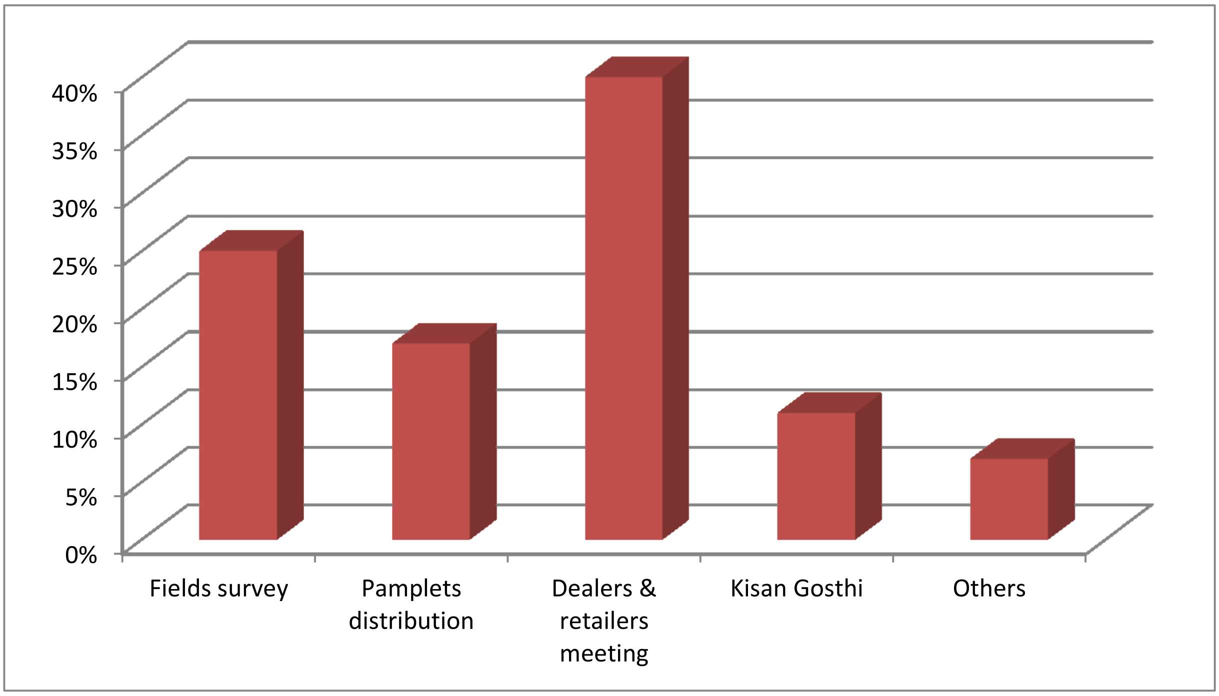


Fig .5.5 Extension program followed by various pesticide companies

5.3.2 Season wise sale

In the pesticide sector highest sale goes in the month of Kharif season starting from July -October, then in Rabi the season between November to March, and the remaining in the Zayed season i.e. between April-June. In the Kharif season maximum vegetables are sown, apart from this no water shortage boost fanners too sow more. During kharif period there is greater extent of attack by insect, pest and disease than in other season thus more pesticide occurs in this season.

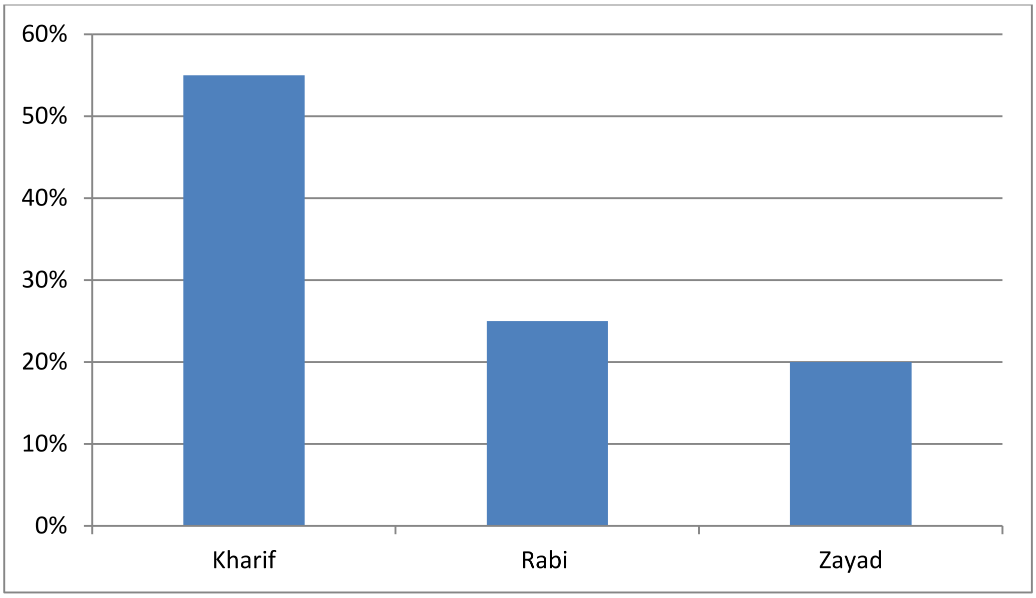


Fig.5.6: Season wise sale

5.3.3 Source of Information about pesticide application to the farmers

With the reference to the survey it was revealed that maximum number of farmers are not fully aware about pesticide application, thus primary source of information remains the retailer whom they meets while returning from mandis after selling their produce. Some of farmers have got good knowledge due to their past experience. Many at times happen that some new problem arises that hampers plant growth for this fanner visit the N.B.R.I. to meet experts and take their recommendations

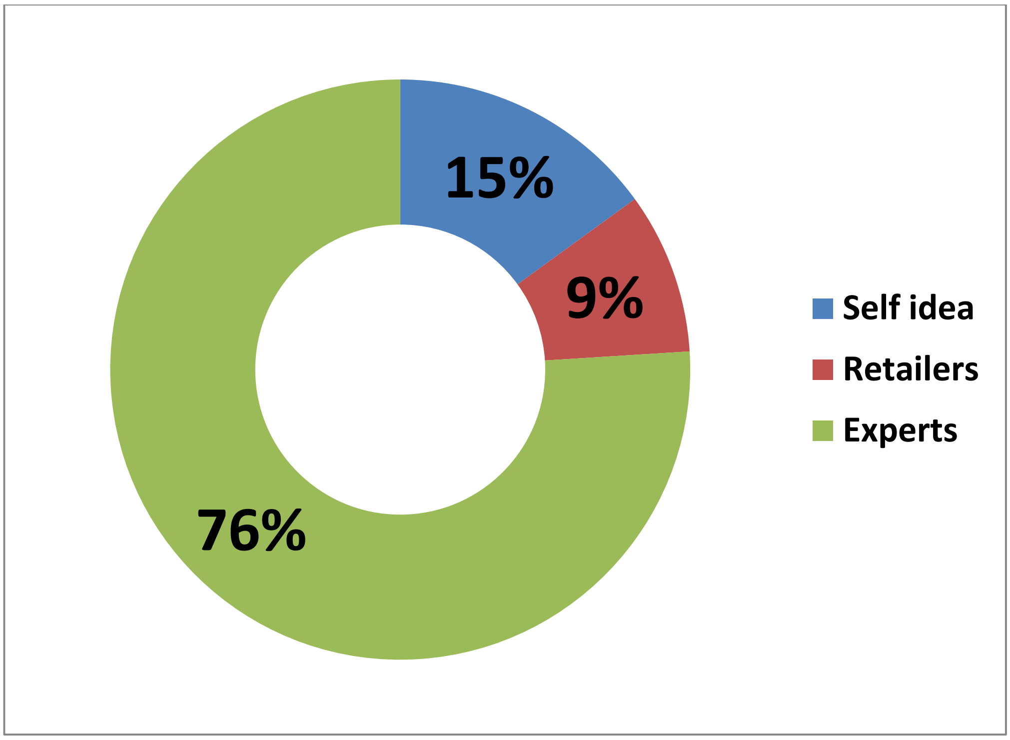


Fig.5.7 Source of Information about pesticide application to the farmers

5.3.4 Type of pesticides used

The figure 5.8 indicates that farmers are used 31per cent of fungicides and 64 per cent pesticide & 5 per cent used growth nutrient.

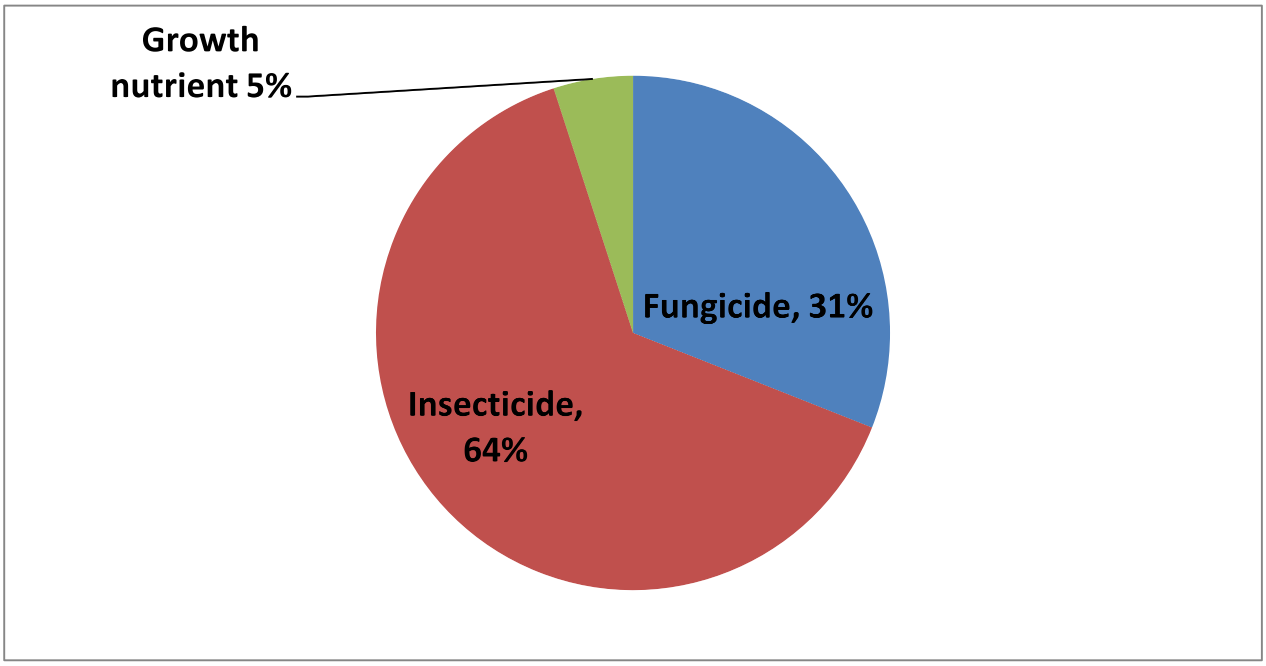


Fig. 5.8 Type of pesticides used

CHAPTER VI

SUMMARY AND CONCLUSIONS

6.0 Summary

The present study entitled "Demand and Supply of Pesticides in Powayan block of Shahjahanpur District: was under taken during the financial year 2013-2014. The main objectives the studies were:

i. To work out Demand and supply of pesticides in study area.

ii. To study the share of different companies in the study area.

111. To study the purchasing behavior of the consumers.

Pesticides/Crop Protection! Agrochemicals industry plays a crucial role in protecting crops from damage by weeds, pests, insects and fungus, both before and after harvest. Major demand of the pesticides in the country is met from the indigenous production for control of diseases, insect pests and weeds. The pattern of pesticide use differs significantly between the countries. The Worldwide consumption of pesticide is about two million tons per year, of which 24 per cent is consumed in the USA alone, 45 per cent in Europe and 25 per cent in the rest of the world. The usage of pesticides in India is only 0.5 kg ha, while in Korea and Japan, it is 6.6 and 12.0 kg ha, respectively. Among the various pesticides used in India, 40 per cent of all the pesticides used belong to organochlroine class of chemical pesticides.

Farmers in many places of powayan adjoining block grow all type crops all the year round, rather than just growing them only when their field is empty from wheat and paddy cultivation. Vegetable growing serves a source of income for them as they sell the produce easily in the mandis. To have good value for their produce they need to have a quality and quantity production, as such they go for huge pesticide application in whatever cultivable land they have compare the different- different company pesticides use. To the effort the focused on the comparative market potential for pesticides in adjoining Powayan block in Shahjahanpur district.

The block Powayan was selected purposively, since it is one of the biggest and most populous blocks in Uttar Pradesh. It located at 27.35 N and 79.37 E coordinates. The district includes eleven blocks (Banda, Khutar, Powayan, Sindhauli, Katra, Jaitipur, Tilhar, Nigohi, Kanth, Dadrol, and Bhawalkhera, and Madnapur, blocks). The Shahjahanpur district enjoys, humid sub-tropical climate and has extreme of weather condition, i.e., heat of summer and cold of winter with annual rainfall of 1236 mm. The mean annual temperature varies from lowest 8.0^0 C to highest of 32.2^0 C. There is a frequent variation from season to season and from month to month. May and June are the hottest months of the year and the coolest month are December and January. The population density of Shahjahanpur is 685 people /km whereas that of the state and the country is 828 and 382 respectively.

Pests and pesticides contribute to the major economic and ecological problems affecting the farmers, crops and their living environment. Two decades of experience in Uttar Pradesh on Non Pesticide Management shows that pest is a symptom of ecological disturbance rather than a cause and can be affectively managed by using local resources and timely action. The emerging new paradigm of sustainable agriculture shows that the new knowledge synthesized from traditional practices supplemented with modem science can bring in ecological and economic benefits to the farmers. The costs of cultivations could be brought down significantly without reduction in yield.

The primary data sources were the retailer s and farmers in the selected block Powayan in district Shahjahanpur. The methodology for the collection of primary data involved interview schedules through pre decided set of questionnaires and open ended discussions at all the levels of retailer and farmers. The secondary data sources included the web portals, and different magazines and journals related with Agro Chemical Business and reports/data available with the department or University and with District Marketing Officers (DMO) of Shahajahanpur. The data, thus collected are analyzed by simple tabular method. Thus, the entire information is such a way as to provide a base for subsequent analysis and interpretation of the findings. The research was conducted at U.P were agricultural crops are grown all the year round. Crops are highly susceptible to insect, pest and diseases for which pesticides are required on larger basis, thus the research brings about a look at the pesticide consumption in districts though a generalized view for the country can't be drawn.

6.1 Conclusion

The main aim of the study was to study the demand and supply of pesticide in the block powayan in district Shahjahanpur to analyze the market share of the companies doing business in the block. Along with these objectives, I also analyzed the level of farmer awareness regarding use of different pesticides and other attributes of the farmers that defined or affected the usage of pesticides. The study also included the comparative analysis of sale of various companies in respective block. Shahjahanpur district is the district surveyed with 4388 sq.km area. The major crop in district is Paddy (rice), followed by Wheat. Major area of these districts is irrigated. It was found in the survey that most of the farmers were in the age group of26 to 50 years (46 per cent). A majority of the farmers are literate with 80 per cent of them having a qualification if junior high school or above. The farmers are mainly dependent on the retailers of pesticides for information. They ask for advice from the shopkeepers and follow the practices as told by them. Only 4 per cent were dependent on agriculture universities for inforn1ation showing a lack of extension activities by the universities and the concerned departments of the government. It is important to increase the extension activities to increase the productivity and thereby the ability of farmers to purchase more pesticides. It was also found that farmers bought pesticides of Indian companies rather than those of MNCs owing to the lower prices and comparative quality.

6.2 Recommendation

6.2.1 About Farmer

Farmer should know about the quality of pesticide.

Farmer always recommends those products which are qualitative and according to their economical status.

An availability of product should be at proper time when farmer need that product.

6.2.2 About Retailer

Retailers always prefer that products which are more profitable for them. According to profit they always need more margins from the product side.

Retailer always recommend good quality product which are easy to sale at farmer level.

6.2.3 About Distributor

Supply chain should be very good by which timely availability is possible for better result.

Distributor margin should be better than other companies. .

Companies should always focus on the satisfaction of its customer.

6.3 Findings

The land holding of most of the farmers is less in Powayan block and Shahjahanpur district. The paddy capturing the maximum acreage is open pollinated and improved variety followed by hybrid and then local variety. Primary purpose of cultivation was a commercial one as growing paddy is a primary source of income. In nursery paddy is affected by damping off while in remaining stages hopper, sucking insects, and borer's etc., attack the most. Retailers provide most of the information regarding pesticide application. Retailers have a good touch and knowledge of pesticide industry besides this they impart a good knowledge about pesticide application to farmer. Farmers mostly grow vegetable and cereal crops. The pesticide consumption is high in vegetables such as okra, chili and beans as they are grown on a large scale. The cost of pesticide application of pesticides in the reason ranges from Rs. 1750 per acre to Rs. 10000 per acre. Most of the usage of pesticides is for the control of sucking pests. The 60 per cent of the pesticide consumption is in the fruiting stage. The consumption is least in the nursery stage.

BIBLIOGRAPHY

Peric, I.; Bicanic, K.; Pirc, A.; Ojurovic, R. and Grladinovic, T. (2010) Analysis of customer satisfaction in furniture market. *Source Drvna Industrija:* 2010; 61: 4,251-258.

Oblak, L.; Kropivsek, I.; Hrovatin, J. and Zupancic, A. (2009). Analysis of the impact on the purchase decision when buying furniture. *Les (Ljubljana).* 2009.61: 5(P), 291-296.

Ganguli and Shirshendu (2008). Breathing Brands. *Advertising Express, February,* pp. 20-23.

Zhifeng, Z.; Mingjiang, M. and Yin, H. (2007). Key factors of web site which influence customer value. Epidemiologic review and research agenda, *American Journal of Ind Med.* 24(6):753-766.

Phil (2006). Pesticide scenario and exposure assessment of workers and their families. *Occup Med.* 12(2):221-237.

Kothari, C.R. (2006). Research Methods and Techniques. *Washwa Prakashan,* New DelhI. pp. 461.

Kottler, P. (2006). Marketing Management. *Prentice Hall of India. New Delhi.* pp.718.

Hicks (2006). Agrow's complete guide to generic pesticides No.3: Successful Business Strategies. *Market Scope Europe,* 6 *Torcross Grove, Calcot, Reading, Berkshire.* RG31 7 AT, UK.

Hundal, B.S.; Anand and Singh, R. (2006). Pesticide Marketing: The Indian Scenario. *The ICFAI Journal of Managerial Economics.* Vol. 4, No.2,

Banumathy, S. and Hemameena, M. (2006). Analysis of brand preference of soft drinks in the global environment. *Indian Journal of Marketing.* 36(6):12-17.

Benjamin, T.G. (2006) Market share liability shouldn't die: proposed application to agricultural pesticides and the need to refine the apportionment of liability. *The ICFAI Journal of Managerial Economics.* Vol. 6, No.2, pp: 48-52.

Reddy, D.; Raghunantha and Shivkumar, N. (2005). Impact analysis of promotional activities of Gunjan Jwellers in urban and semi-urban areas. Indian Journal of Marketing. 35(11): 3-11.

Kessuda (2005). Marketing Communication of Rice-Pesticide Market in Singburi Province. *University of Thai Chamber of Commerce Department of Marketing communication.* 22: 34-39.

Srivastava, U.K. and Patel, T.N. (2001). An Overview of Pesticides Industry and Marketing Environment. IIMA Working Papers from Indian Institute of Management Ahmedabad, Research and Publication Department No 812.

Devid, L. and Ronald, S. (1999). Market Research. *Prentice Hall of India, New Delhi, pp. 683.*

Gupta, S.L. (1999). Marketing Research. *Excel bks. New Delhi.* pp.297.

Web sites

- The Energy and Resources Institute, India. Online at:

  http://www.teri.res.in/teriin/news/terivsn/issue31/pesticid.htm.

- Directorate of Plant Protection, Quarantine & Storage

  http://dacnet.nic.in/ppin/ipmpesticides.htm.

- District government website. Information on the district

- www.Shahjahanpur.nic.in/

- www.indiastat.com
- www.dupont.com
- www.indianindustry.com
- www.marketresearch.com
- www.pesticideinfo.org

APPENDICES

9.0 Schedule

9.1 Questionnaire for farmer

Name of Respondent	
Village	
Block	
District	AGE Group

Questions-what is your qualification.

1. Illiterate
2. Junior High school
3. Intermediate
4. Graduate or above

Questions-what is your farm holding (in acre)?

……………..Acres

Questions-what is your annual income?

- Less than -50000
- Between 50000-10000
- Above 100000

Questions – Resources of information?

1. Govt. officers
2. TV
3. Radio
4. News paper
5. Agriculture university
6. Agriculture shop

Question- which system of farming is practiced?

1. Individual farming

2. Joint farming

Question- if you want to purchaser pesticide which type of problem you face?

1. High cast
2. Foundation
3. Technical guidance
4. All above

Question-what type of quality of pesticide do you prefer?

1. Which problem immediate action.
2. Slow action
3. Less toxic
4. No Residual effect

Question-how farmer is aware about the product?

1. FA of companies
2. News paper
3. Village level
4. Retailer

Question-what is buying behavior of a farmer?

1. Retailer suggestion
2. Own suggestion
3. Other suggestion

Question - Important pest problem in crops?

Sr.No.	Insect	insecticide	brand	qty	when		total	% Age Of loss
					pre	post		

Question -Disease problem in crops?

Sr. No.	Disease	Chemical	BRAND	Qty	when		Total	% Age Of loss
					pre	post		

9.2 Questionnaire for retailer

Name of respondent/retail store...........	
Name of town……………..	Post ………
Phone No……..	District …….
Name of shop owner…………	Pin code…..

Question -company of which pesticides are sold?

…………………..   …………………………..

Question -share of total products in total sale?

……………………

Question - Extension work done by different companies?

Company	Type	Efficacy

Question -Ratio of different formulation on vegetables?

Dust ……………….

Liquid………………

Granules ………….

Question – Ratio of pesticide used on crops?

Fungicide……………..

Insecticide……………

Growth nutrients……………

Question –Different scheme offered by the companies to the retailers?

……………………………………………………………

Question –what is your qualification?

Intermediate or below

Graduate in Agriculture

Graduate in science

Graduate in other stream

Question –what is distance of remote area which is covered by?

You ……………………………

Question – what is the supply status of pesticide according to demand?

A) Insecticide proper supply/No proper supply
B) Fungicide proper supply/No proper supply
C) Herbicide proper supply/No proper supply

Question –which type of product are you have?

Only branded product

Branded & unbranded