A Study On Consumers' Perceived Value And Satisfaction With Insecticides Used In Paddy In Jorhat District Of Assam

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INTRODUCTION

The agrochemical industry in general is a seasonal industry and since it is connected to agricultural production, it is a core industry in India. For agriculture to be commercially viable, with various other inputs, it requires certain key agrochemicals and pesticides are one of them. A perusal of the table 1 depicts that average pesticide consumption in India over a period of 1991 to 2007 was 51.79 thousand tones. Though compound growth rate (CGR) shows a negative growth rate, it cannot be denied that on the demand side, farmers were concerned that their larger and more frequent harvests would draw insect pests. This fright, along with influential marketing by pesticide producers, led farmers to spray ever-increasing quantities of these chemicals on their crops. Anticipating the importance and opportunity, a number of players entered into the market. Among the multinationals, there are Bayer Crop Sciences, Syngenta, De-Nocil, Monsanto, BASF's agro division, Dupont's agrochemical division and Cheminova. In the domestic players- United Phosphorus, Exel Industries, Rallis, Gharda Chemicals, Sabero, Nagarjuna Agrichem and Indofil are the main players. Though there are MNCs and domestic players in the industry, there is no such difference in quality of products manufactured by them. It is more a question of product range.

Table 1: Consumption Of Pesticides (Technical Grade Material) At All India Level

Year	R^2	CGR	Equation	Average(Thousand tones)	SD	CV%
1991- 2000	0.977	-0.0511	$y = 76.232e^{-0.0511x}$	58.21	9.12	15.67
2000- 2007	0.637	-0.0329	$y = 48.444e^{-0.0329x}$	42.61	3.85	9.03
1991- 2007	0.941	-0.0387	$y = 71.941e^{-0.0387x}$	51.79	10.72	20.70

Source-Computations are based on data from "agricultural statistics at a glance 2008 and 2009".

The ultimate buyer of the products of these companies is the farming section. But unlike the past, the farmer is much more educated and aware today. The up-and-coming trends reveal that they are becoming gradually well-informed and therefore, ask for greater assured performance from products and companies. This has lead to change in the marketing approach of the growth- conscious companies. There has been a shift from the sellers' market to the buyers' market. Now, customer is the king (Unii, 2000). The growing competition in the industry has brought the companies under pressure to win customers. This increasing competition had made the customers more empowered. They can demand a right- they did not have it until recently. And "…*businesses must adapt to the empowered consumer."* (Kotler, 2003). Unfortunately, most of marketing theory and practice centers on the art of attracting new customers rather than on retaining and cultivating existing ones. The emphasis traditionally has been on making sales rather than building relationships; on reselling and selling rather than caring for the customer afterwards. A company would be wise to measure customer satisfaction regularly, because key to customer retention is customer satisfaction. A highly satisfied customer stays loyal longer, buys more as the company introduces new products, and upgraded, existing products, talks favorably about the company and its products, pays less attention to the competing brands and is less sensitive to price, offers products or service ideas to the company, and costs less to serve than new customers because transactions are routine (Kotler, 2003). On an average, a satisfied customer tells three people about a good product experience, but

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the average dissatisfied customer bad mouths to 11 people. If each of them tell other people, the number of people exposed to bad word of mouth may grow exponentially (Goodman, 1986; Brown and Chandrashekharan, 1998).If a company wants to adapt to the empowered consumer, it is a must to recognize the importance of satisfying and retaining customers.

With a gross cropped area of 1, 83,126 Ha and 1, 13,557 number of farm families; Jorhat district of Assam provides a big market for the agrochemical companies. Seeing the opportunity, a number of agrochemical companies have entered into the Jorhat market. Because market has become so competitive, it is very important for the companies to know where they stand among the competitors in terms of creating a brand image and satisfying the ultimate consumer of agrochemicals i.e. the farmer. In this paper, an attempt has been made to make an image analysis and measure consumer satisfaction for various insecticide brands applicable in paddy. The surveys haven't merely measured the customer satisfaction for different brands, but have actually ranked brands on the basis of customer delight. The difference is simple. Certain brands exceed customer expectations. These are the brands that delight the customer, not merely satisfy him. The study will help in assessing the current image of the companies, their products and of competitors. This will help a company in knowing the current awareness level of its products and those of competitors among the target audience i.e. the farmers. The study will also help a company to know how the consumer forms preferences among the brands in the choice set and also what is their perceived value about different insecticide brands used in paddy in Jorhat pesticide market. Thus, the findings of the present study may provide a basis for the company policy makers to formulate new plans, decide production and marketing strategies and design research works for future in- depth studies.

METHODOLOGY

Jorhat, being one of the agriculturally developed district in Assam, is located in between 340 to 350 North latitude and 300 to 450 East longitude at an altitude of 71 m from the mean sea level. Jorhat district comprises of three sub-

Table 2: Distribution Of Sample Farmers According To Size Classes Of Holding

Sl. No.	Subdivision	Selected household				Total Sample
		Marginal (below 1 ha)	Small (1 Ha to below 2 Ha)	Medium (2 Ha below 3 Ha)	Large (3 Ha and above)	
1	Jorhat	2	16	20	12	50
2	Titabor	0	17	23	10	50
3	Majuli	1	16	24	9	50
	Total	**3**	**49**	**67**	**31**	**150**
		(2.00)	**(32.67)**	**(44.67)**	**(20.67)**	**(100.00)**

Table 3: Distribution Of Respondents According To Educational Standards For Different Size Groups

Sl. No.	Size groups	Respondent	Illiterate	Literate				
				Upto primary level	Upto high school level	Upto PU/ HS level	Graduate above	Total
1	Marginal	3	1	1	1	0	0	2
		(2.00)	(0.67)	(0.67)	(0.67)	(0.00)	(0.00)	(1.33)
2	Small	49	18	5	14	11	1	31
		(32.67)	(12.00)	(3.33)	(9.33)	(7.33)	(0.67)	(20.67)
3	Medium	67	32	6	13	14	2	35
		(44.67)	(21.33)	(4.00)	(8.67)	(9.33)	(1.33)	(23.33)
4	Large	31	11	2	7	8	3	20
		(20.67)	(7.33)	(1.33)	(4.67)	(5.33)	(2.00)	(13.33)
	Total	**150**	**62**	**14**	**33**	**35**	**6**	**88**
		(100.00)	**(41.33)**	**(9.33)**	**(22.00)**	**(23.33)**	**(4.00)**	**(58.67)**

divisions- Jorhat, Titabor and Majuli. All the three subdivisions were selected for the purpose of study. Jorhat has 16 ADO circles- 7 in Jorhat subdivision, 6 in Titabor subdivision and 3 in Majuli subdivision. Six ADO circles namely Allengmara and Selenghat from Jorhat subdivision, Titabor and Bagchung from Titabor subdivision and Kamalabari and Jengrai from Majuli sub- subdivision were randomly selected for the purpose of detailed investigation. Five villages from each subdivision with 2 from one of the ADO and 3 from other were randomly selected for the purpose of detailed investigation. 10 farm households from each selected villages were selected. Thus, 150 farmers spread over three subdivisions and 15 villages formed the basic sample for this study. The distribution of farmers under various categories is given in Tables 2 and 3.The data collection was done by personal interview method. As the farmers of Jorhat district are not so technically sound about the pesticides, opportunities were provided to them to furnish information after referring to the pesticide packets which were used (if available) as well as through joint discussion and consensus with other family members, which also served as a cross-checking mechanism. The collected data were tabulated, analyzed and interpreted in the light of the specific objective of the present study by the following statistical techniques.

IMAGE ANALYSIS THROUGH PERCEIVED VALUE

It was derived from expectancy value model. The consumer arrives at attitudes (judgments, preferences) towards brands through an attribute evaluation process. He or she develops a set of beliefs about where each brand stands on each attribute. The expectancy- value model of attitude formation posits that consumers evaluate products and services by combining their brand beliefs- the positive and negative- according to importance.In short, it is based on attitude and weight generally put on by the consumer. The expectancy value model is of the following form.

$$A_{jk} = \sum_{i=1}^{n} W_{ik} B_{ijk}$$

Where,
k= Consumer
j= Brand
i= Attribute
A_{jk}= Consumer k's attitude score for brand j
$W_{ik=}$ Importance weight assigned to attribute i for consumer k
B_{ijk}= Consumer k's belief as to the amount of attributed i offered by a brand j
n= Number of attributes important in the selection of given brand

CONSUMER SATISFACTION SURVEY

As has been discussed earlier, the approach has been to measure the brands on their ability to delight their customers on the perceived quality of products and service, and not just to satisfy them. Thus, the following the model (that has been used by Dubey and Vaish (2004)) has been used for the study, where the numbers and the ranking are based on the percentage of customers who have given an excellent or very good on the relevant parameters (which are the top two boxes on the 5- point scale of excellent, very good, good, fair or poor). Those giving fair or poor were also looked at to arrive at the extent of dissatisfaction with any brand. Based on the answers of respondents, the following indices were found out.

i) Consumer Experience Index: Consumer experience index is a composite of his total experience with the brand, from quality to technical guidance. For consumer delight index, it is the percentage of consumers rating it as very good or excellent. For consumer dissatisfaction index, it is the percentage of consumers rating it as fair or poor.

ii) Loyalty Index: Loyalty index is a composite measurement of the proportion of consumers who will buy the product again and will also recommend it. For consumer delight index, it is the percentage of consumers who are extremely or very loyal. For consumer dissatisfaction index, it is the percentage of consumers highly or extremely unlikely to buy again.

iii) The Delight/Dissatisfaction Index: The delight/dissatisfaction indices are derived by finding the mean of the experience and loyalty indices.

iv)The Loyalty Stakes: The loyalty stakes looks at only the "most loyal" and the "most likely to defect" , and not the people in between.

RESULTS AND DISCUSSION

JORHAT DISTRICT AT A GLANCE

Jorhat is one of the agriculturally developed districts of Assam. The rainy season starts from April to September due to which the winter paddy (Sali) grows well without need of extra irrigation. At present, the major crops that are grown comprise of the pulses and oilseeds with a concomitant cultivation of paddy. But overall, paddy holds the prominent position. Table 4 shows the area, production and average yield of rice along with standard deviation and coefficient of variation in Jorhat district of Assam. This has created a demand for seed, fertilizer and pesticides. At present, there are 246 retail agents for pesticides in the study area. Knowing the opportunity, a number of agrochemical companies have entered the market of Jorhat.

Table 4: Area, Production And Average Yield Of Rice In Jorhat District Of Assam (as Per Final Forecast)

A: Area in hectares; P: Production in tones; AY: Average yield in kg/Hectare

Rice		2000- 01	2001- 02	2002- 03	2003- 04	2004- 05	Average	SD	CV%
1	2	3	4	5	6	7			
Autumn Rice	A	6540	8312	4774	3723	3512	5372.2	1819.023	33.86
	P	6712	7157	3002	2812	2225	4381.6	2104.827	48.04
	AY	1043	875	639	768	644	793.8	152.1597	19.17
Winter Rice	A	84000	89852	72700	80909	77555	81003.2	5798.692	7.16
	P	156115	159611	118514	139740	131732	141142.4	15282.9	10.83
	AY	1887	1803	1655	1753	1724	1764.4	77.78329	4.41
Summer Rice	A	1203	765	376	566	474	676.8	292.763	43.26
	P	1798	1360	664	1015	712	1109.8	424.7797	38.28
	AY	1495	1777	1767	1794	1501	1666.8	138.1078	8.29
Total Rice	A	91743	98929	77850	85198	81541	87052.2	7504.05	8.62
	P	164625	168128	122180	143567	134669	146633.8	17528.46	11.95
	AY	1822	1725	1593	1711	1678	1705.8	74.02	4.34

Source: Computations are based on data from "Agricultural statistics at a glance 2008 and 2009".

Table 5: Technical Product Wise Insecticide Usage In Paddy By Different Categories Of Farmers

Sl. No.	Product	Number of farmErs					Rank
		Marginal	Small	Medium	Large	Total	
1	Chlorpryiphos	0	20	20	11	51	I
		(0.00)	(13.33)	(13.33)	(7.33)	(34)	
2	Quinalphos	0	3	18	5	26	III
		(0.00)	(2.00)	(12.00)	(3.33)	(17.33)	
3	Monocrotophos	0	5	18	6	29	II
		(0.00)	(3.33)	(12.00)	(4.00)	(19.33)	
4	Carbofuran	3	14	1	1	19	IV
		(2.00)	(9.33)	(0.67)	(0.67)	(12.67)	
5	Phorate	0	0	1	0	1	VIII
		(0.00)	(0.00)	(0.67)	(0.00)	(0.67)	
6	Phosalone	0	0	4	0	4	VII
		(0.00)	(0.00)	(2.67)	(0.00)	(2.67)	
7	Dimethoate	0	0	4	15	19	IV
		(0.00)	(0.00)	(2.67)	(10.00)	(12.67)	
8	Malathion	0	0	3	11	14	VI
		(0.00)	(0.00)	(2.00)	(7.33)	(9.33)	
9	Non users	0	8	5	0	13	
		(0.00)	(5.33)	(3.33)	(0.00)	(8.67)	
Total Respondent		3	49	67	31	150	
		(2)	(32.67)	(44.67)	(20.67)	(100)	

INSECTICIDE USAGE BY FARMER

(1) Technical Product Wise Insecticide Usage By Farmers : There are several brands (formulations) of pesticides for the same technical product. For example, the technical product Endosulfan is available with different brand (formulation) names as Endocel, Thioden etc., from different manufacturers. So, in the present study, an attempt has been made to find out the various products used by the farmer in paddy. As farmers are not literate enough to name the technical component of the brand they have used, so, only brand(formulation) name was obtained from the farmer and from these formulation names, the technical components are found out by consulting the experts. Technical product wise insecticide usage by farmers for paddy is presented in table 5. A perusal of the table shows that 34 percent paddy growers opted for Chlorpyriphos, which is the highest, followed by Monocrotophos which was opted by 19.33 percent of paddy growers and 17.33 percent have gone for Quinalphos.

(2) Brand(Formulation) Wise Insecticide Usage By Farmers : Brand wise pesticide usage by farmers for paddy is presented in table 6. It is apparent from the table that as many as 9 insecticides have been used by rice growers. Dursban has topped the list with a user base of 34 percent. Monocil with a user base of 19.33 percent is second on the list.

Table 6: Brand Wise Insecticide Usage In Paddy By Different Categories Of Farmers

Sl. No.	Product	Number of farmer					Rank
		Marginal	Small	Medium	Large	Total	
1	Dursban	0	20	20	11	51	I
		(0.00)	(13.33)	(13.33)	(7.33)	(34.00)	
2	Furadon	3	14	1	1	19	IV
		(2.00)	(9.33)	(0.67)	(0.67)	(12.67)	
3	Thimet 10G	0	0	1	0	1	IX
		(0.00)	(0.00)	(0.67)	(0.00)	(0.67)	
4	Monocil	0	5	18	6	29	II
		(0.00)	(3.33)	(12.00)	(4.00)	(19.33)	
5	Ekalux	0	3	18	5	26	III
		(0.00)	(2.00)	(12.00)	(3.33)	(17.33)	
6	Rogor	0	0	2	7	9	VII
		(0.00)	(0.00)	(1.33)	(4.67)	(6.00)	
7	Krogor	0	0	2	8	10	VI
		(0.00)	(0.00)	(1.33)	(5.33)	(6.67)	
8	Zolone	0	0	4	0	4	VIII
		(0.00)	(0.00)	(2.67)	(0.00)	(2.67)	
9	Malathion 5 % dust	0	0	3	11	14	V
		(0.00)	(0.00)	(2.00)	(7.33)	(9.33)	
10	Non users	0	8	5	0	13	
		(0.00)	(5.33)	(3.33)	(0.00)	(8.67)	
Total Respondent		3	49	67	31	150	
		(2.00)	(32.67)	(44.67)	(20.67)	(100)	

(3) Company Wise Insecticide Usage By Farmers : Though it is clear from earlier findings and discussions of this paper that majority of the farmers purchased products based on its brand (formulation) name and not on the basis of the company name. But to see the overall position of the various companies in the market, it is very important to know how many farmers have used the pesticides of a single company. So based on the responses of the farmers regarding brands they used, the number of users for various companies was found out (Table 7). The table depicts that as many as 7 company's insecticides were used by respondent paddy growers during the study period. DeNocil is far above its rivals, with 53.33 percent paddy growers using its products. The second spot was held by Rallis India Limited, whose products were used by 18.67 percent of the paddy growers.

Table 7: Company Wise Insecticide Usage In Paddy By Different Categories Of Farmers

Sl. No.	Product	Number of farmer					Rank
		Marginal	Small	Medium	Large	Total	
1	DeNocil	0	25	38	17	80	I
		(0.00)	(16.67)	(25.33)	(11.33)	(53.33)	
2	Rallis India Ltd	3	14	3	8	28	II
		(2.00)	(9.33)	(2.00)	(5.33)	(18.67)	
3	BASF India Ltd	0	0	1	0	1	VII
		(0.00)	(0.00)	(0.67)	(0.00)	(0.67)	
4	Syngenta Crop Protection	0	3	18	5	26	III
		(0.00)	(2.00)	(12.00)	(3.33)	(17.33)	
5	Krishi Rasayan	0	0	2	8	10	V
		(0.00)	(0.00)	(1.33)	(5.33)	(6.67)	
6	Cheminova India Ltd	0	0	4	0	4	VI
		(0.00)	(0.00)	(2.67)	(0.00)	(2.67)	
7	Assam Chemicals	0	0	3	11	14	IV
		(0.00)	(0.00)	(2.00)	(7.33)	(9.33)	
8	Non users	0	8	5	0	13	
		(0.00)	(5.33)	(3.33)	(0.00)	(8.67)	
Total Respondent		3	49	67	31	150	
		(2.00)	(32.67)	(44.67)	(20.67)	(100)	

BRAND IMAGE

Consumers vary as to which product attribute they see most relevant and the importance they attach to each attribute. They will pay most attention to attributes that deliver the sought after benefits. The consumer develops a set of brand beliefs about where each product stands on each attribute. The set of beliefs about a brand make up the brand image. The consumer's brand image will vary with his experiences. Today, most buyers consider several attributes in their purchase decision. So, to arrive at the attitude formed by consumers towards the brands that have been used, first 5 attributes were short listed and weight attached by each farmer to these attributes was found out. Now, to find the farmers' perceived value for the brand they have used, their weight was multiplied by their belief about the attributes of brands. The results are presented in table 8. Malathion 5% dust of Assam chemicals topped the list which has the highest average perceived value of 3.97. With an average perceived value at 3.83, Dursban of De Nocil was at number two position.

Table 8: Farmers' Perceived Value About Various Insecticide Brands

Sl.No	Brand	Company	Total Score On Different Attributes						Rank
			Price	Quality	Popularity	Packaging	Technical guidance	Total	
1	Dursban	DeNocil	52.60	84.90	23.90	23.10	10.70	195.20	II
			(1.03)	(1.67)	(0.47)	(0.45)	(0.21)	(3.83)	
2	Furadon	Rallis India Ltd	15.60	19.70	10.40	6.30	2.70	54.70	VIII
			(0.82)	(1.04)	(0.55)	(0.33)	(0.14)	(2.88)	
3	Thimet 10G	BASF India Ltd	40.70	67.90	35.60	22.40	7.80	174.40	IV
			(0.81)	(1.36)	(0.71)	(0.45)	(0.16)	(3.49)	
4	Monocil	DeNocil	17.8	37.80	14.60	13.50	3.90	87.60	VI
			(0.61)	(1.30)	(0.50)	(0.47)	(0.13)	(3.02)	
5	Ekalux	Syngenta Crop Protection	16.00	42.20	14.20	8.90	3.40	84.70	V
			(0.62)	(1.62)	(0.55)	(0.34)	(0.13)	(3.26)	
6	Rogor	Rallis India Ltd	5.40	14.10	4.40	6.70	1.50	32.10	III
			(0.60)	(1.57)	(0.49)	(0.74)	(0.17)	(3.57)	
7	Krogor	Krishi Rasayan	6.40	12.40	3.30	5.30	2.20	29.60	VII
			(0.64)	(1.24)	(0.33)	(0.53)	(0.22)	(2.96)	
8	Zolone	Cheminova India Ltd	2.10	5.60	1.50	1.50	0.40	11.10	IX
			(0.53)	(1.40)	(0.37)	(0.38)	(0.10)	(2.78)	
9	Malathion 5 % dust	Assam Chemicals	66.4	108.10	47.00	39.20	9.50	270.20	I
			(0.98)	(1.59)	(0.69)	(0.58)	(0.14)	(3.97)	

CONSUMER SATISFACTION SURVEY

Recognizing the importance of customer satisfaction, a consumer satisfaction research was conducted to see the satisfaction level attained by various companies. The consumers were administered a structured questionnaire that included an assessment of their overall attitudes and loyalty towards the products that they have used in the last year. The findings of the study where than tabulated, analysed and presented in table 9, table 10 and table 11. The table 9 reveals that in the insecticide category, Malathion 5% dust of Assam Chemicals was the number one brand and was able to delight 72.06 percent of the customers. Around 66 percent of the customers rated their experience with the brand as very good or excellent. And around 78 percent users said that they will buy the product again and will also recommend it to other farmers.

Table 9: Consumer Delight Index

Sl.No	Brand	Company	Experience Index	Loyalty Index	Consumer Delight	Rank
1	Dursban	DeNocil	62.75	77.45	70.09	II
2	Furadon	Rallis India Ltd	57.89	76.32	67.11	IV
3	Thimet 10G	BASF India Ltd	56.00	78.00	67.00	V
4	Monocil	DeNocil	51.72	77.59	64.56	
5	Ekalux	Syngenta Crop Protection	61.54	76.92	69.23	III
6	Rogor	Rallis India Ltd	56.56	72.22	63.89	VI
7	Krogor	Krishi Rasayan	50.00	75.00	62.50	VII
8	Zolone	Cheminova India Ltd	50.00	75.00	62.50	VII
9	Malathion 5 % dust	Assam Chemicals	66.18	77.94	72.06	I

Table 10 shows the dissatisfaction index and the users of Zolone were found to be most dissatisfied with the product (25 percent).

Table 10: Consumer Dissatisfaction Index

Sl.No	Brand	Company	Experience Index	Loyalty Index	Consumer Delight	Rank
1	Dursban	DeNocil	3.92	8.83	6.37	IX
2	Furadon	Rallis India Ltd	10.53	10.52	10.52	IV
3	Thimet 10G	BASF India Ltd	6.00	9.00	7.50	VI
4	Monocil	DeNocil	6.89	6.89	6.89	VII
5	Ekalux	Syngenta Crop Protection	7.69	11.54	9.62	V
6	Rogor	Rallis India Ltd	11.11	11.11	11.11	III
7	Krogor	Krishi Rasayan	10.00	15.00	12.50	II
8	Zolone	Cheminova India Ltd	25.00	25.00	25.00	I
9	Malathion 5 % dust	Assam Chemicals	4.41	8.82	6.62	VIII

Table 11: The Loyalty Stakes

Sl.No	Brand	Company	Potential defectors (%)	Truly loyal(%)
1	Dursban	DeNocil	3.92	25.49
2	Furadon	Rallis India Ltd	5.26	15.79
3	Thimet 10G	BASF India Ltd	4.00	28.00
4	Monocil	DeNocil	3.45	17.24
5	Ekalux	Syngenta Crop Protection	3.85	26.92
6	Rogor	Rallis India Ltd	11.11	22.22
7	Krogor	Krishi Rasayan	10.00	30.00
8	Zolone	Cheminova India Ltd	25.00	25.00
9	Malathion 5 % dust	Assam Chemicals	4.41	20.59

Table 11 show the loyalty stakes which looks at only the 'most loyal' and the 'most likely to defect', not the consumers in between. The table shows that Krogor of Krishi Rasayan being the number one brand in terms of having customers which are truly loyal(30 percent) whereas 10 percent of its customers are potential defectors.

CONCLUSION

Unlike the past, the farmer is much more educated and aware today. The up-and-coming trends reveal that they are becoming gradually knowledgeable and, therefore, ask for greater assured performance from products and companies. Moreover, the increasing competitions in the agrochemical industry have made the farmers (customers) more empowered. All these have necessitated a change in the marketing approach of the growth conscious companies. The study has shown that there is reasonable demand for seed, fertilizer and pesticides in the Jorhat market. To supply these agri- inputs, a number of retail agents have come up. Knowing the opportunity, a number of agrochemical companies have entered the Jorhat market. Since paddy is the principle crop of this region- both in terms of area and number of families it supports, the study was limited to paddy growers only. There are several brands (formulation) of pesticides for the same technical product. In terms of technical product, around 34 percent of paddy growers opted for Chlorpyriphos, 19.33 percent have used Monocrotophos and 17.33 percent have gone for Quinalphos. In terms of brands, as many as 9 insecticide brands have been used by paddy growers with Dursban topping the list with user of 34 percent. As many as 7 companies insecticide are used by growers with De Nocil topping the list. Brand image study reveals that Malathion 5% dust of Assam Chemicals is the topper which has the highest average perceived value of 3.97. This brand was also able to satisfy/delight 72.06 percent of the customers, which is the highest.

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