

# Market Share and Promotional Approaches of Pesticide Companies for Vegetable Crops in Jammu District

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## ABSTRACT

The present paper has described the market share of pesticides in Jammu district. In Jammu and Kashmir vegetables are grown over an area of 63.1 thousand ha with annual production of 1395.5 thousand MT and average productivity of 22.1 MT/ha, which is higher than national average of 17.6 MT/ha. Pesticide market is currently lead by insecticides products followed by fungicides and herbicides, reportedly insecticide demand accounts for 65 per cent of the total pesticide market share. The company namely Insecticide India Limited stands first in the sale of insecticides namely Nuvan with a share of 14.98 per cent followed by Bayer (Fame) and Gharda (Hamla 500) with a share of 14.11 per cent and 11.97 per cent, respectively. The company namely Indo FIL leads in the tally with a market share of 17.38 per cent for selling M-45 Juba in case of fungicides whereas in weedicides Monsanto has highest share in the market (17.27%). Awareness about pesticide companies among farmers of Jammu district indicates that 86.67 per cent respondent farmers were aware of Bayer Crop Science followed by 75 per cent (Monsanto), 66.67 per cent (Crystal), 62.67 per cent (Dupont), 55.00 per cent (Syngenta), 55.00 per cent (FIL) and 40 per cent (UPL). The retail trader influence, company representative influence and on farm demonstration are the key factors influencing farmers' for purchase of pesticides.

## HIGHLIGHTS

- Market share of Indo FIL is highest i.e. 17.38 per cent for selling M-45 Juba fungicide whereas Monsanto has highest share in the market (17.27%) for selling weedicides.
- Majority of the farmers in the study area preferred Roundup weedicide followed by Nomni Gold, Cutout 38 and Agni brands

**Keywords:** Pesticides, market, companies, brands, factors

Agriculture is the primary growth engine of the Indian economy as nearly 59 per cent of the population of the country depends on agriculture. The share of agriculture in GDP increased to 19.9 per cent in 2020-21 from 17.8 per cent in 2019-20. The last time the

contribution of the agriculture sector in GDP was at 20

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per cent was in 2003-04. The agriculture sector share in total export and import trade was 13.2 and 7.1 per cent, respectively during the year 2018-19. Agri-exports touched ₹ 2.52 lakh crores and imports at ₹ 1.47 lakh crores in financial year 2019-20 (Economic Survey, 2020-21). India with a cultivated land area of about 150 million hectares, currently ranks 2nd in the world in agricultural production with a value of \$367 billion and 8th largest in agricultural produce exports with a value of \$ 35 billion (Economic Times, 2017). Now-a-days, providing employment to nearly 59 per cent of the population and ensuring food security to more than 1.21 billion populations with diminishing cultivable land resource is a herculean task. This necessitates use of high yielding variety of seeds, balanced use of fertilizers and recommended usage of quality pesticides along with educating farmers in use of modern farming techniques. Pesticides act as a protective umbrella for the other inputs and they play an important role in crop production by way of controlling insect pests, diseases and weeds, which in turn help in avoiding huge losses in farm produce. The global agrochemical market size is estimated to grow from USD 208.6 billion in 2020 and is projected to reach USD 246.1 billion by 2025, at a Compound Annual Growth Rate of 3.4%, during the forecast period. The agrochemicals market was evaluated at US\$ 265.590 billion for the year 2019 and is projected to grow at a CAGR of 3.21% to reach a market size of US\$343.430 billion by the year 2026. The Indian pesticides market was worth INR 181 Billion in 2017. The market is further projected to reach INR 292.9 Billion by 2023, at a CAGR of 8.3% during 2018-2023. As far as the Indian Pesticide Industry's concerned, India currently is the 4<sup>th</sup> largest global producer of Pesticides after the USA, Japan, and China. Domestic consumption of pesticides in India is worth US\$ 2.77 billion while exports worth US\$ 2.31 billion, a total market size worth US\$ 5.08 billion (Ficci, 2020). Factors such as continuous advancements in the technology used in agriculture have led to a shift in farming practices. Insecticides dominate the Indian Crop Protection market and form almost 53 percent of the domestic crop protection chemicals market, followed by Herbicides 24 percent, Fungicides 19 percent, and others 4 percent (Maroni *et al.* 2006). A major application of pesticides in India is in

rice and cotton. Herbicides are emerging as the fastest-growing segment amongst agrochemicals.

During the last five decades, the productivity of Indian agriculture has increased dramatically. The yield of crops like rice and wheat almost doubled and the yield of the other food as well as non- food crops too increased considerably. Pesticides are substances or a mixture of substances intended for preventing, destroying, repelling or mitigating any pest. Pesticides represent the last input in an agricultural operation and are applied for preventing the spoilage of crops from pests such as insects, fungi, weeds, etc., thereby increasing the agricultural productivity. The significance of pesticides has been rising over the last few decades catalyzed by the requirement to enhance the overall agricultural production and the need to safeguard adequate food availability for the continuously growing population in the country. In India, pests and diseases, on an average eat away around 20-25% of the total food produced. Looking forward, the publisher expects the Indian pesticides market to exhibit moderate growth during the next five years during fiscal year of 2019, insecticide had the largest market share in the pesticide market in India. Insecticides protect the crops by either killing the insects or by preventing their attack based on their type of application. India's consumption of pesticide is only 3 per cent of total world's consumption of pesticides. Jammu region of the state is bestowed with agro-climates ranging from subtropical plains with an altitude of 300 m above mean sea level (msl) to intermediate lower and higher zones having altitude up to 1500 m above msl and more. Total Pesticide consumption in the Union Territory of Jammu & Kashmir during the year 2016-17 was 2188 million tonnes (Ministry of Agriculture and Farmers Welfare, 2018). In Jammu and Kashmir vegetables are grown over an area of 60.12 thousand ha with annual production of 1337.12 thousand MT and average productivity of 22.24 MT/ha, which is higher than national average of 18.27 MT/ha (<https://agricoop.nic.in>).

Pesticide market is currently lead by insecticides products followed by fungicides and herbicides, reportedly insecticide demand accounts for 65 per cent of the total pesticide market share. Keeping in

view above points, the study entitled “*Market share and Promotional Approaches of Pesticide Companies for vegetable crops in Jammu district*” was undertaken with the objective to find out the market share of different brands of pesticides used in vegetables and also promotional approaches followed by pesticide companies to increase their sale.

## MATERIALS AND METHODS

### Sampling procedure and sample size

Multi stage sampling design was used for the selection of samples. From the Jammu district two blocks were selected on the basis of highest area under vegetable cultivation. Thereafter two villages from each block and fifteen farmers from each village were selected randomly to constitute a sample of 60 farmers. Ten pesticide retailers from Jammu district were selected randomly to study the market share and promotional approaches used by pesticide companies.

### Methods of analysing data

Tabular and percentage analysis was done to find out the result of proposed objectives:

1. **Tabular analysis:** This approach was used for the analysis of the market share of different pesticide companies. The companies present in the business in the district were tabulated, computed and analyzed using different percentage analysis.

### Percentage analysis

Percentage refers to a special kind of ratio. It is used to make comparison between two or more series of data. They can be used to compare the relative items, the distribution of two or more series of data, since the percentage reduces everything to a common base and there by allow meaningful comparisons to be made. In the present study the percentage analyses helped to check the relative comparison of weekly sales of different retail outlets in terms of percentage.

$$\text{Percentage} = X/Y \times 100$$

Where, X and Y differ according to the objectives of the study.

2. **Garret ranking technique:** Garrett’s ranking technique was used to rank factors influencing farmers’ brand preference for various brands of pesticides & promotional approaches that influence on farmers’ in pesticide marketing. The order of the merit given by the respondents was converted into ranks by using the following formula. Accordingly these ranks were converted to scores by referring to Garrets table.

Garrett’s formula for converting ranks into per cent was given by:

$$\text{Per cent position} = 100*(R_{ij} - 0.50)/N_j$$

Where,

$R_{ij}$  = Rank given for  $i^{\text{th}}$  factor by  $j^{\text{th}}$  individual

$N_j$  = Number of factors ranked by  $j^{\text{th}}$  individual

## RESULTS AND DISCUSSION

Market share of different brands of pesticide in Jammu district were studied wherein share of different brands of insecticide sold by the sample retail traders in Jammu district is presented in Table 1. Eight numbers of companies were identified selling about twelve products in the market. The table provides very interesting information about the insecticides sold in the market. The company namely Insecticide India Limited stands first in the sale of insecticides namely Nuvan with a share of 14.98 per cent followed by Bayer (Fame) and Gharda (Hamla 500) with a share of 14.11 per cent and 11.97 per cent, respectively. Other companies selling products in the market have a very small percentage share in the prevailing market. The total sale for all the types of insecticides sold by respondent retailers was found to the tune of ₹ 5.75 lakhs.

The market share of different brands of fungicides is presented in Table 2. The company namely Indo fil leads in the tally with a market share of 17.38 per cent for selling M-45 Juba brand followed by UPL and Bayer with a market share of 12.90 per cent and 12.78 per cent for selling Saaf and Folicure brands, respectively. Total share of Adama and Bayer as a company was found to be 16.98 per cent and 15.81 per cent as both the companies are having other brands of fungicides in the market viz Mirador & Custodia of Adama and Antracol of Bayer.

**Table 1:** Market share of different brands of insecticides in Jammu district (in percent)

Sl. No.	Brand Name	Companies	Average Sales/retailer/year (₹ in lakhs)	Percentage Share
1	Coragen	FMC	0.604	10.50
2	Fame	Bayer	0.812	14.11
3	Sac-505	Shivalik Crop Science Pvt. Ltd	0.361	6.27
4	Nova	Galaxy Crop Care Pvt. Ltd.	0.272	4.73
5	Sharp	Insecticide India limited	0.235	4.08
6	Lepto	ATUL	0.173	3.01
7	Hamla 550	Gharda	0.689	11.97
8	Lethal	Insecticide India Limited	0.327	5.68
9	Rocket	PI	0.313	5.44
10	Cyper-10	Shivalik Crop Science Pvt. Ltd	0.431	7.49
11	Larvin	Bayer	0.675	11.73
12	Nuvan	Insecticide India Limited	0.862	14.98
<b>Total</b>			<b>5.754</b>	<b>100</b>

**Table 2:** Market share of different brands of fungicides in Jammu district (in percent)

Sl. No.	Brand Name	Companies	Average Sales/retailer/year (₹ in Lakhs)	Percentage Share
1	Saaf	UPL	0.631	12.90
2	Master	Rallis India	0.528	10.80
3	Metalman	SML	0.306	6.26
4	M-45 Juba	Indofil	0.850	17.38
5	Juba Gold	Atul	0.181	3.70
6	Pearl	SML	0.232	4.74
7	Folicure	Bayer	0.625	12.78
8	Custodia	Adama	0.392	8.02
9	Tilt	Crystal	0.279	5.71
10	Reedomil	Sygenta	0.280	5.73
11	Mirador	Adama	0.438	8.96
12	Antracol	Bayer	0.148	3.03
<b>Total</b>			<b>4.89</b>	<b>100</b>

The other companies like Rallis India, Syngenta, Adama also share a meagre percentage in the market. The total sale for all the types of fungicides sold by respondent retailers was found to the tune of ₹ 4.89 lakhs.

Table 3 represents market share of different brands of weedicides. In addition to insecticide and fungicides, weedicides are also now emerging as one of the type of pesticides with a lot of market potential in the study area. With respect to the important players in the market

Monsanto has highest share in the market (17.27%) followed by Rallis (15.25%) PI (13.47%), FIL industries Ltd. (10.97%), Crystal (10.43%) and JU (8.13%). The total sale for all the types of weedicides sold by respondent retailers was found to the tune of ₹ 8.262 lakhs.

The market share of different pesticide producing companies is presented in Table 4. It is clear from the table that market share of pesticides in the Jammu district has spread over to more than 18 companies with

**Table 3:** Market share of different brands of weedicides in Jammu district (in percent)

Sl. No.	Brand Name	Companies	Average Sales/retailer/year (₹ in Lakhs)	Percentage Share
1	Roundup	Monsanto	1.427	17.27
2	Tata Metri	Rallis India	0.714	8.64
3	Agni Plus	FIL Industries Limited	0.906	10.97
4	Sartaj	Rallis India	0.546	6.61
5	Total	UPL	0.182	2.20
6	Arrow	SML	0.358	4.33
7	Cut out-38	Crystal	0.862	10.43
8	Hunter	JU	0.672	8.13
9	Killer	Galaxy	0.520	6.29
10	Agil	Adama	0.637	7.71
11	Trass	Shivalik	0.325	3.93
12	Nomni Gold	PI	1.113	13.47
<b>Total</b>			<b>8.262</b>	<b>100</b>

**Table 4:** Market share of pesticide companies in Jammu district for the year 2018-2019

Sl. No.	Name of Company	Average Sales/retailer/year (₹ in Lakhs)	Percentage Share
1	Sygenta	0.280	1.53
2	FMC	0.604	3.30
3	UPL	0.813	4.45
4	BAYER	1.635	8.94
5	ATUL	0.354	1.94
6	Crystal	1.140	6.24
7	Galaxy	0.792	4.33
8	Adama	1.467	8.02
9	FIL	0.906	4.96
10	Rallis India	1.788	9.78
11	JU	0.672	3.68
12	Shivalik	1.117	6.11
13	PI	1.426	7.80
14	SML	0.896	4.65
15	Monsanto	1.427	7.81
16	IndoFil	0.850	4.65
17	Gharda	0.689	3.77
18	Insecticide India Limited	1.424	7.79
<b>Total</b>		<b>18.281</b>	<b>100</b>

total sales of ₹ 18.281 crores during 2017-18. Among these companies Rallis India has largest market share of 9.78 per cent with a total sale of pesticides nearing to ₹ 1.788 crores. The Bayer has its presence in the market with a market share of 8.94 per cent with total sale of

₹ 1.635 crores. The other companies also more or less had share in the market.

Awareness about the pesticide companies along with their brands among farmers' and promotional strategies adopted by the pesticide companies were also studied

in the study area during the research programme. Awareness about pesticide companies among farmers of Jammu district is represented in Table 5.

**Table 5:** Awareness about pesticide companies among farmers in Jammu district

Sl. No.	Companies	Farmers' aware about pesticide companies	
		Number	Percent
1	Bayer	52	86.67
2	Monsanto	45	75.00
3	Crystal	40	66.67
4	Dupont	37	61.67
5	Syngenta	33	55.00
6	Fil	27	45.00
7	UPL	24	40.00
8	Gharda	21	35.00
9	Atul	15	25.00
10	Galaxy	15	25.00
11	Insecticide India Ltd	14	23.33
12	Adama	12	20.00

It indicates that 86.67 per cent respondent farmers were aware of Bayer Crop Science followed by 75 per cent (Monsanto), 66.67 per cent (Crystal), 62.67 per cent (Dupont), 55.00 per cent (Syngenta), 55.00 per cent (Fil) and 40 per cent (UPL). However, companies like Atul, Galaxy, Insecticide India Ltd., and Adama were least known to the sample farmers in the Jammu district.

### **Influence of promotional activities on farmers purchase behaviour in pesticides marketing**

The Influence of promotional activities on farmers' purchase of pesticides is presented in Table 6. Among various factors, the retail trader influence, company representative influence and on farm demonstration are the key factors influencing farmers' for purchase of pesticides, which are ranked first, second and third with the mean scores of 80.78, 74.68 and 66.16, respectively. Farmers' meeting, distribution of literature and samples, through participation in fairs and wall painting are moderately influencing factors, which are ranked fourth, fifth, sixth, and seventh with mean scores of 60.61, 56.29, 51.29 and 49.11, respectively. The remaining

activities like banners, posters, radio, local papers and theaters are least influencing factors which are ranked eighth, ninth, tenth, eleventh and twelfth with the mean scores of 41.92, 38.66, 33.20, 28.04 and 19.27 respectively.

**Table 6:** Influence of promotional activities on farmers purchase behaviour in pesticides marketing

Sl. No.	Attributes	Total score	Mean Garrett's score	Rank
	Retail traders influence	7270	80.78	I
2	Company representative influence	6721	74.68	II
3	On farm demonstration	5954	66.16	III
4	Farmer meetings	5455	60.61	IV
5	Distribution of literature	5066	56.29	V
6	Through participation in fairs	4616	51.29	VI
7	Wall paintings	4420	49.11	VII
8	Banners	3773	41.92	VIII
9	Posters	3479	38.66	IX
10	Radio	2988	33.20	X
11	Local papers	2524	28.04	XI
12	Theaters	1734	19.27	XII

### **CONCLUSION**

Based on the segment, the market share has been segmented on the basis of insecticides, fungicides, herbicides and others. The competitive landscape of the market has also been examined in the project and the profiles of key players have also been provided. The total available arable land per capita has been reducing in recent years as a result of increasing urbanization levels and is expected to reduce further in the coming years. Driven by rising population levels, food demand is expected to continue increasing in the coming years. Farmers expect pesticides to play a key role in increasing the average crop yields per hectare. The agrochemicals market is competitive with major players including Rallis India, Bayer, Crystal, Adama Agricultural Solutions, Shivalik, Monsanto, Corteva Agriscience and Nufarm accounted for the majority of the share in the global market. Companies with highest rate of awareness among farmer are Bayer, Monsanto,

Crystal, Dupont, Syngenta, Fil, UPL, Gharda, Atul, Galaxy, Insecticide India Limited and Adama. Among the most 12 popular brands of insecticides, majority of the sample farmers preferred Fame followed by Hamla 550, Lara-909, Coragen, Cyper 10 and Larvin brands in the study area. Among the most 9 popular brands of fungicides, majority of the sample farmers preferred M-45 followed by Master, Pearl, Bavistine, and Nativo brands in the study area. Among the most 7 popular brands of weedicides, majority of the sample farmers preferred Roundup followed by Nomni Gold, Cutout 38 and Agni brands in the study area. Companies with highest rate of awareness among farmer are Bayer, Monsanto, Crystal, Dupont, Syngenta, Fil, UPL, Gharda, Atul, Galaxy, Insecticide India Limited and Adama.

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