



Farmer's perception about PI industries insecticides in Nagpur District

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Abstract

This study examines farmers' identification of and perception towards PI Industries insecticides in three talukas of Nagpur district Hingna, Parshivni and Kuhi — based on a survey of 90 soybean, cotton and vegetable growers (30 per taluka) for the year 2025-26. Among the six PI Industries insecticides considered, Osheen emerged as the most preferred product (27.77 per cent of farmers), followed by Keefun (22.22 per cent), Dorito (14.44 per cent), Maxima and CARINA (12.22 per cent each), and Rokat (11.11 per cent). Farmers identified insecticides mainly on the basis of active ingredient (28.89 per cent) and prior field experience (27.78 per cent), ahead of brand name (24.44 per cent) and dealer recommendation (18.89 per cent). On perception, the products received favourable ratings overall: 44.44 per cent of farmers considered the price reasonable and a further 30.00 per cent affordable; 73.33 per cent rated effectiveness as highly or moderately effective; 52.22 per cent found the products easily available in the market; and 76.66 per cent rated packaging as good or very good. The findings indicate that PI Industries insecticides enjoy strong farmer acceptance in Nagpur district, driven chiefly by product effectiveness, reasonable pricing and reliable market availability, with Osheen and Keefun standing out as the most trusted brands in the insecticide portfolio.

Keywords: Agrochemicals, PI industries, Nagpur District, farmer perception, insecticides

Introduction

Insecticides form a critical input in modern crop production, protecting cotton, soybean, paddy and vegetable crops from sucking and chewing insect pests that would otherwise cause substantial yield and quality losses. PI Industries Limited, incorporated in 1946 and renamed PI Industries Limited in 1992, is one of India's leading agriscience companies, offering a diverse insecticide portfolio that includes Osheen (Dinotefuran 20% SG), Keefun (Tolfenpyrad 15% EC), Dorito (Diafenthiuron + Dinotefuran), Maxima (Thiamethoxam 25% WG), Rokat (Profenofos + Cypermethrin) and CARINA (Profenofos 50% EC), recommended across cotton, paddy, vegetables and other field crops.

Nagpur district, situated in the Vidarbha region of Maharashtra and known chiefly for orange cultivation alongside cotton, soybean and pulses, is an important market for crop protection chemicals. Farmers in the district choose insecticides based on a mix of product performance, active ingredient, price, market availability, and packaging and dealer advice. Understanding how farmers identify PI Industries insecticides and how they perceive these products in terms of price, effectiveness, availability and packaging offers useful insight into brand performance and adoption patterns in the region.

The present paper draws on the following objectives of the study:

1. To study and identify the insecticides of PI Industries.
2. To find the perception of farmers about PI Industries insecticides.

Methodology

Area and Period of Study

The study was conducted in Nagpur district of Maharashtra, covering three talukas Hingna, Parshivni and Kuhi. Data pertains to the year 2025-26. Primary data were collected from 90 farmers (30 per taluka) through personal interviews using a structured schedule. Secondary data were drawn from PI Industries' annual reports, company brochures, product manuals and the official company website.

Selection of Insecticides

Six PI Industries insecticides were selected for the study, namely Osheen, Keefun, Dorito, Maxima, Rokat and CARINA, covering the major active ingredients and chemical groups marketed by the company for sucking and chewing pest management.

Analytical Tools

Simple tabular and percentage analysis was used to identify the insecticides marketed by PI Industries and to assess farmers' perception of the products with respect to price, effectiveness, availability and packaging.

Results and Discussion

1. Study and identification of PI Industries insecticides

Information on the insecticide products of PI Industries was compiled from the company's product catalogue, representatives and website. Table 1 presents the product profile of the six insecticides considered in the study.

Table 1: Product Profile of Selected PI Industries Insecticides

Product Name	Type / Active Ingredient	Use
Osheen	Dinotefuran (Neonicotinoid)	Brown plant hopper, sucking pests
Keefun	Pyrazole chemistry	DBM, thrips, aphids, jassids
Dorito	Whitefly management product	Sucking pest complex
Maxima	Neonicotinoid insecticide	Sucking insects
Roket	Contact and stomach insecticide	Chewing and sucking insects
CARINA	Profenofos 50% EC	Broad-spectrum insecticide and acaricide

Farmers' preference among these six insecticides is presented in Table 2. Osheen emerged as the most preferred product, chosen by 25 of the 90 farmers (27.77 per cent), followed by Keefun with 20 farmers (22.22 per cent) and Dorito with 13 farmers (14.44 per cent). Maxima and CARINA were each preferred by 11 farmers (12.22 per cent), while Roket recorded the lowest preference with 10 farmers (11.11 per cent). The results indicate that farmers' choices are influenced by product effectiveness, prior experience, availability, price and dealer recommendation.

Table 2: Farmers' Preference towards PI Industries Insecticides

Sr. No.	Insecticide	No. of Farmers	Percentage
1	Osheen	25	27.77
2	Keefun	20	22.22
3	Dorito	13	14.44
4	Maxima	11	12.22
5	Roket	10	11.11
6	CARINA	11	12.22
	Total	90	100.00

Table 3 shows the basis on which farmers identify and select PI Industries insecticides. The largest proportion of farmers, 26 (28.89 per cent), identified insecticides on the basis of the active ingredient, closely followed by 25 farmers (27.78 per cent) who relied on previous experience. Brand name was the basis for 22 farmers (24.44 per cent), while 17 farmers (18.89 per cent) depended on dealer recommendation. This suggests that farmers in Nagpur district are reasonably knowledgeable about insecticide formulations and increasingly base their purchase decisions on technical composition and personal field experience rather than brand or dealer influence alone.

Table 3: Basis of Identification / Utilization of PI Industries Insecticides

Sr. No.	Basis of Identification	No. of Farmers	Percentage
1	Brand name	22	24.44
2	Dealer recommendation	17	18.89
3	Previous experience	25	27.78
4	Active ingredient	26	28.89
	Total	90	100.00

The chemical composition of the preferred insecticides is summarised in Table 4. Osheen contains Dinotefuran (20 per cent) of the neonicotinoid group, Keefun contains Tolfenpyrad (15 per cent) of the pyrazole group, Dorito combines Diafenthion (48 per cent) and Dinotefuran (8 per cent) from the thiourea and neonicotinoid groups, Maxima contains Thiamethoxam (25 per cent), also a

neonicotinoid, and Roket combines Profenofos (40 per cent) with Cypermethrin (4 per cent) from the organophosphate and synthetic pyrethroid groups. This diversity of chemical groups gives farmers multiple options suited to different pest complexes and crop requirements.

Table 4: Chemical Composition of Preferred Insecticides

Sr. No.	Insecticide	Active Ingredient	Composition (%)	Chemical Group
1	Osheen	Dinotefuran	20	Neonicotinoid
2	Keefun	Tolfenpyrad	15	Pyrazole
3	Dorito	Diafenthion + Dinotefuran	48 + 8	Thiourea + Neonicotinoid
4	Maxima	Thiamethoxam	25	Neonicotinoid
5	Roket	Profenofos + Cypermethrin	40 + 4	Organophosphate + Synthetic pyrethroid

Table 5 presents the benefits farmers primarily associate with insecticide use. Control of chewing pests was the most cited benefit, reported by 25 farmers (27.77 per cent), followed closely by increase in crop yield and prevention of crop damage, each reported by 23 farmers (25.55 per cent). Control of sucking pests was cited by 19 farmers (21.11 per cent). These results confirm that pest control remains the primary driver of insecticide use, with farmers also valuing the contribution of insecticides to yield protection.

Table 5: Perceived Benefits of Insecticide Use

Sr. No.	Benefit	No. of Farmers	Percentage
1	Increase crop yield	23	25.55
2	Prevent crop damage	23	25.55
3	Control chewing pests	25	27.77
4	Control sucking pests	19	21.11
	Total	90	100.00

Farmers' rating of insecticide quality is shown in Table 6. Forty farmers (44.44 per cent) rated the quality of PI Industries insecticides as excellent and a further 35 (38.88 per cent) rated it good, together accounting for 83.32 per cent of respondents. Only 12 farmers (13.33 per cent) rated quality as average and 3 (3.33 per cent) as poor, indicating a strongly favourable perception of product quality.

Table 6: Farmers' Perception regarding Quality of Insecticide

Sr. No.	Quality	No. of Farmers	Percentage
1	Excellent	40	44.44
2	Good	35	38.88
3	Average	12	13.33
4	Poor	3	3.33
	Total	90	100.00

Table 7 presents the quantity of the three most-used insecticides applied per acre. For Osheen, the 40–50 g/acre range was most common, used by 12 farmers (13.33 per cent). For Keefun, most farmers (16 farmers, 17.77 per cent) used 100–150 g/acre, while for Dorito the 150–200 g/acre range was most common, used by 15 farmers (16.66 per cent). Keefun at 100–150 g/acre recorded the highest overall usage share among all quantity categories, reflecting its recommended dosage for broad-spectrum pest control.

Table 7: Quantity of Preferred Insecticide Used (g/acre)

Insecticide	Quantity (g/acre)	No. of Farmers	Percentage
Osheen	40–50	12	13.33
	50–60	6	6.66
	>60	8	8.88
Keefun	100–150	16	17.77
	150–200	10	11.11
	>200	11	12.22
Dorito	150–200	15	16.66
	200–250	7	7.77
	>250	5	5.55

The toxicity status of the selected insecticides is presented in Table 8. Osheen, Dorito and Maxima are classified as moderately toxic, while Keefun is classified as highly toxic. Osheen and Maxima carry the blue triangle (“Danger”) hazard symbol, whereas Keefun and Dorito carry the yellow triangle (“Poison”) symbol, indicating that farmers need to exercise appropriate care and follow label instructions while handling these products.

Table 8: Toxicity Status of Selected PI Industries Insecticides

Sr. No.	Insecticide	Toxicity Status	Toxicity Symbol
1	Osheen	Moderately toxic	Blue triangle – Danger
2	Keefun	Highly toxic	Yellow triangle – Poison
3	Dorito	Moderately toxic	Yellow triangle – Poison
4	Maxima	Moderately toxic	Blue triangle – Danger

2. Farmers' perception about PI Industries insecticides

Farmers' perception of PI Industries insecticides was assessed across four key parameters — price, effectiveness, availability and packaging — based on the responses of the 90 surveyed farmers.

Table 9 presents farmers' perception regarding price. Forty farmers (44.44 per cent) considered the price of PI Industries insecticides reasonable, while 27 farmers (30.00 per cent) considered them affordable; together, 74.44 per cent of farmers viewed the pricing positively. Only 23 farmers (25.55 per cent) considered the products expensive, suggesting that price is broadly acceptable relative to product performance, though affordability may still vary with farm size and crop income.

Table 9: Farmers' Perception regarding Price of PI Industries Insecticides

Sr. No.	Perception	No. of Farmers	Percentage
1	Affordable	27	30.00
2	Reasonable	40	44.44
3	Expensive	23	25.55
	Total	90	100.00

Farmers' perception regarding effectiveness is presented in Table 10. Thirty-six farmers (40.00 per cent) rated the insecticides as highly effective and 30 farmers (33.33 per cent) as moderately effective, together accounting for 73.33 per cent of respondents. Twenty-four farmers (26.66 per cent) considered the products less effective, a view likely influenced by pest severity, application method and dosage used.

Table 10: Farmers' Perception regarding Effectiveness of PI Industries Insecticides

Sr. No.	Effectiveness	No. of Farmers	Percentage
1	Highly effective	36	40.00
2	Moderately effective	30	33.33
3	Less effective	24	26.66
	Total	90	100.00

Table 11 presents farmers' perception of product availability. Forty-seven farmers (52.22 per cent) reported that PI Industries insecticides were easily available, while 35 farmers (38.88 per cent) found them available only sometimes, and 8 farmers (8.88 per cent) reported difficulty in obtaining the products. While availability was generally satisfactory, the sizeable share reporting occasional shortages points to scope for strengthening the distribution and dealer supply network, particularly during peak pest-control periods.

Table 11: Farmers' Perception regarding Availability of PI Industries Insecticides

Sr. No.	Availability	No. of Farmers	Percentage
1	Easily available	47	52.22
2	Sometimes	35	38.88
3	Difficult	8	8.88
	Total	90	100.00

Farmers' perception regarding packaging is shown in Table 12. Thirty-nine farmers (43.33 per cent) rated the packaging as very good and 30 farmers (33.33 per cent) as good, together accounting for 76.66 per cent of respondents. Twenty-two farmers (24.44 per cent) rated packaging as average and only 9 farmers (10.00 per cent) as poor. Good packaging supports safe handling, easy storage and protection of product quality, contributing positively to overall farmer satisfaction.

Table 12: Farmers' Perception regarding Packaging of PI Industries Insecticides

Sr. No.	Packaging	No. of Farmers	Percentage
1	Very good	39	43.33
2	Good	30	33.33
3	Average	22	24.44
4	Poor	9	10.00
	Total	90	100.00

Conclusions

Farmers in Nagpur district identify PI Industries insecticides mainly on the basis of active ingredient and prior field experience rather than brand name or dealer advice alone, reflecting a reasonably informed farming community. Among the six products studied, Osheen and Keefun stand out as the most preferred insecticides, together accounting for exactly half of all farmer preferences, while Rokat recorded the lowest adoption. Farmers hold a strongly positive perception of PI Industries insecticides across all four parameters studied — price, effectiveness, availability and packaging — with a majority of respondents rating each parameter favourably. Effectiveness and availability emerge as the strongest drivers of farmer satisfaction, while the share of farmers reporting occasional supply shortages and

comparatively lower effectiveness against resistant pests highlights areas where PI Industries can strengthen its distribution network and product performance to further consolidate its market position in the district.

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