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Farmer perception of a newly introduced insecticide brand versus established competitors in paddy pest management: A study in wanaparthy district, Telangana

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Abstract

Aim of the Study: This study aimed to assess farmers' perception of a newly introduced insecticide brand (Brand A) relative to six established competing brands (Brands B to G) used against the yellow stem borer (*Scirpophaga incertulas*) and the leaf folder (*Cnaphalocrocis medinalis*) in paddy, and to examine whether this perception differed significantly across brands. It forms the farmer-perception component of a broader dissertation study on the Wanaparthy paddy insecticide market; the competitive-structure and brand-equity components of that dissertation are reported separately.

Study Design, Area and Duration: The study adopted a descriptive research design (Kothari, 2004) and was conducted in Wanaparthy district of Telangana, where paddy is the major crop grown and insecticide use among farmers is high, during 2026.

Methodology: A multistage sampling procedure was followed: four major paddy-growing mandals were purposively selected, two villages were chosen from each mandal, and 15 farmers were selected from each village, giving a total sample of 120 farmers. Perception of seven major insecticide brands was recorded using a pre-tested, structured interview schedule on a five-point Likert scale across five attributes-effectiveness against target pests, safety to crop and applicator, ease of application, price or value for money, and dealer support and availability. Data were analysed using percentage analysis, mean scores and one-way ANOVA.

Results: The long-established Brand B recorded the most favourable overall perception (mean score 4.16), followed by the newer Brand A (4.02), which nonetheless recorded the highest safety rating among all seven brands (4.10). The one-way ANOVA ($F(6, 353) = 27.816, p < 0.001$) confirmed a statistically significant difference in perception across the seven brands. Price positioning, awareness of correct dosage and timing, and dealer availability emerged as recurring concerns among farmers. The findings suggest that while an established market presence continues to shape farmer perception most strongly, a newer product can gain relatively favourable acceptance when it is clearly differentiated on a specific attribute such as safety.

Keywords: Farmer perception, insecticide brands, paddy, stem borer, leaf folder, Likert scale, one-way ANOVA

1. Introduction

Rice (*Oryza sativa* L.) is a principal food crop across Asia (FAO, 2024) and a major source of rural livelihood in India, including in Telangana, where public irrigation investment and farmer welfare initiatives have supported a steady expansion of paddy area over the past decade (Ministry of Agriculture and Farmers Welfare, 2024). Productivity, however, continues to be constrained by insect pests, particularly the yellow stem borer and the leaf folder, which attack the crop at different growth stages and can cause substantial yield loss when not managed in time (Mahajan *et al.*, 2017) [6].

To control these pests, farmers depend on a range of insecticide brands, and agrochemical companies continue to introduce new molecules claiming improved efficacy, safety

or resistance management over existing products. Farmers' brand choices are shaped less by the chemistry of a molecule than by their own experience and perception of it: across different Indian states, dealer influence, price, past experience, product availability and brand image have been identified as the leading drivers of farmers' pesticide brand preference (Harish *et al.*, 2023) [3], while a broader study of farmer purchasing behaviour toward agrochemicals similarly found product trust, quality, accessibility and dealer recommendation to be the dominant factors shaping brand perception (Dhamsania and Patel, 2025; Kannan *et al.*, 2025) [1, 4].

What these studies have not addressed is how farmers perceive a newly introduced brand once it is placed directly alongside brands they have used for years, within the same

market and pest-management context, nor have they accounted for the fact that a farmer who rates more than one brand contributes non-independent observations that require appropriate statistical treatment. This article addresses that gap using the farmer-perception dataset from a larger dissertation study. It analyses farmers' perception of a recently introduced insecticide brand (referred to here as Brand A) in comparison with six established competing brands (Brands B to G) used for the management of stem borer and leaf folder in paddy, in Wanaparthy district of Telangana. The dissertation's companion analysis of market structure and brand equity, which draws on additional dealer-level and commercial data, is presented separately and is outside the scope of this article.

2. Materials and Methods

2.1 Study area

Wanaparthy district in southern Telangana was purposively selected for the study because paddy is the major crop grown in the district, insecticide use among paddy farmers is high, and several competing brands, including the newer molecule under study, are available through local dealers.

2.2 Sampling

A multistage sampling procedure was followed. Four major paddy-growing mandals were purposively selected, two villages were chosen from each mandal, and 15 farmers were selected from each village, giving a total sample of 120 farmers. Users of the newer brand were identified first, from among whom 12 farmers per village (96 farmers in all) were drawn by simple random sampling; the remaining three farmers per village, who used one of the established competing brands, were also selected by simple random sampling (24 farmers).

2.3 Data collection

Primary data were collected through a pre-tested, structured interview schedule covering farmers' usage pattern, purchasing behaviour, and perception of the insecticide brands they had used. Respondents were informed of the purpose of the study and their participation was voluntary. A five-point Likert scale, ranging from "strongly agree" to "strongly disagree", was used to record farmers' opinions on five brand attributes: effectiveness against target pests, safety to crop and applicator, ease of application (mixing and spraying), price or value for money, and dealer support and product availability. Secondary information on the study area and the pest problem was drawn from government publications and published research.

2.4 Analytical tools

Data were tabulated and analysed using percentage analysis and mean scores. An overall perception score was computed for each brand as the average of its five attribute-wise mean scores, and brands were ranked accordingly. One-way analysis of variance (ANOVA) was used to test the null hypothesis that the mean overall perception scores were equal across the seven brands, against the alternative hypothesis that at least one brand mean differed. The test was evaluated at the 1 per cent level of significance. The analysis was based on 360 brand-level perception observations reported by the 120 sample farmers, because a

farmer could rate more than one brand they had used.

3. Results and Discussion

3.1 Profile of sample farmers

All 120 sample farmers were male, and about 63 per cent belonged to the 25-45 years age group, indicating that paddy cultivation in the study area is largely carried out by economically active farmers. The large majority (95 per cent) had received some level of formal education. In terms of landholding, about 68 per cent of the farmers belonged to the small and medium categories (2.5-10 acres), 18 per cent were marginal farmers, and the remaining 13 per cent were large farmers.

3.2 Farmers' perception across brand attributes

Farmers' perception of the seven insecticide brands was assessed across five attributes on a five-point Likert scale, with a higher score indicating a more favourable perception. Table 1 presents the attribute-wise mean scores.

Table 1: Farmers' perception of insecticide brands across key attributes (mean scores, n = 120)

Brand	Effectiveness	Safety	Ease of application	Price / value	Dealer support & availability
Brand A	4.30	4.10	4.00	3.90	3.80
Brand B	4.40	4.00	4.10	4.20	4.10
Brand C	4.10	3.90	3.90	3.20	3.80
Brand D	4.00	4.00	3.86	3.80	3.90
Brand E	3.85	3.60	3.80	4.00	3.60
Brand F	3.70	3.80	3.70	4.00	3.50
Brand G	3.60	3.60	3.60	4.00	3.40

Source: Primary data.

On effectiveness against the target pests, the long-established Brand B recorded the highest mean score (4.40), closely followed by the newer Brand A (4.30), a gap of only 0.10. Brand C (4.10) and Brand D (4.00) formed a middle group, while Brand E (3.85), Brand F (3.70) and Brand G (3.60) were rated lowest. Brand A therefore scored 0.20 to 0.70 points higher than each of the five remaining brands.

On safety to the crop and to the person applying the insecticide, Brand A recorded the highest score among all seven brands (4.10), ahead of Brand B and Brand D (4.00 each), Brand C (3.90), Brand F (3.80), and Brand E and Brand G (3.60 each). This was the only attribute on which Brand A outscored Brand B.

For ease of application, Brand B was rated easiest to mix and spray (4.10), followed by Brand A (4.00), Brand C (3.90), Brand D (3.86), Brand E (3.80), Brand F (3.70) and Brand G (3.60). The spread across all brands was narrow (0.50), which suggests that ease of application did not strongly separate the brands.

Price/value showed the widest variation. Brand B offered the best perceived value for money (4.20), followed by Brands E, F and G (4.00 each), Brand A (3.90), Brand D (3.80) and Brand C (3.20). Brand A scored 0.30 lower than Brand B here. Brands E, F and G were rated relatively well on price despite their lower scores on other attributes, while Brand C was rated far lower than every other brand (0.70 below Brand A).

On dealer support and availability, Brand B again led (4.10),

followed by Brand D (3.90), Brand A and Brand C (3.80 each), Brand E (3.60), Brand F (3.50) and Brand G (3.40). Brand A trailed Brand B by 0.30 on this attribute.

Overall, the established brand held an advantage on price, ease of application and dealer support, while the newer brand's principal point of differentiation in this sample was safety.

3.3 Overall perception score and ranking

An overall perception score was computed for each brand as the average of its five attribute-wise mean scores (Table 2).

Table 2: Overall mean perception score and rank of insecticide brands

S. No.	Brand	Overall mean perception score (out of 5)	Rank
1	Brand B	4.16	1
2	Brand A	4.02	2
3	Brand D	3.91	3
4	Brand C	3.78	4
5	Brand E	3.77	5
6	Brand F	3.74	6
7	Brand G	3.64	7

Source: Primary data.

Brand B recorded the highest overall mean perception score (4.16) and ranked first, followed by Brand A (4.02, rank 2), Brand D (3.91, rank 3), Brand C (3.78, rank 4), Brand E (3.77, rank 5), Brand F (3.74, rank 6) and Brand G (3.64, rank 7). The gap between Brand B and Brand A was 0.14 points, and Brand A led Brand D by 0.11. Brands C, E and F were closely bunched (3.74 to 3.78), with Brand C and Brand E separated by only 0.01. Brand G ranked last, 0.52 points behind Brand B. Within this sample, Brand A's second-place ranking, ahead of five more established competitors, is consistent with relatively favourable early acceptance among the farmers interviewed; this observation is descriptive of the study sample and should not be generalised beyond it.

3.4 Difference in perception across brands: one-way ANOVA

One-way ANOVA was used to test whether the mean perception scores differed significantly across the seven brands (Table 3).

Table 3: One-way ANOVA of farmers' perception across insecticide brands

Source of variation	Sum of squares	df	Mean square	F-value
Between groups (brands)	10.843	6	1.807	27.816
Within groups	22.933	353	0.065	
Total	33.776	359		

Source: Primary data

The one-way ANOVA indicated a statistically significant difference in mean perception scores among the seven brands, $F(6, 353) = 27.816$, $p < 0.001$. The between-brand sum of squares was 10.843 and the within-brand sum of squares was 22.933. The corresponding eta-squared effect size was 0.321 (10.843/33.776), indicating that approximately 32.1 per cent of the total variation in the

analysed perception scores was associated with differences among brands. Thus, the null hypothesis of equal brand means was rejected. The ANOVA establishes an overall difference among the seven brands; it does not, by itself, identify which specific pairs of brands differ. The descriptive mean scores in Tables 1 and 2 are therefore interpreted alongside the omnibus ANOVA result.

Statistical note: Because the perception data were recorded at the brand level and some farmers reported ratings for more than one brand, the 360 observations should be described as brand-level observations rather than as 360 independent respondents. The present ANOVA result is consequently an omnibus comparison of the recorded brand-level scores. No pairwise post-hoc significance claims are made in this article because such claims require the underlying respondent-level data and an appropriate multiple-comparison procedure.

3.5 Challenges reported by farmers

Farmers using the newer brand most frequently cited its higher cost per acre relative to some alternative brands (reported by about 65 per cent of its users) as a constraint, followed by limited availability of the product at all local dealers (55 per cent), insufficient awareness of the correct dosage and timing of application (45 per cent), and reluctance to switch away from a previously used brand (40 per cent). A smaller proportion of users also pointed to the need for precise spraying technique and a perceived delay in visible pest knockdown compared with contact insecticides. These findings suggest that price positioning, dealer-level availability and farmer education on correct usage are among the barriers to wider adoption of a newly introduced insecticide brand, even where farmers already view it favourably on safety and effectiveness.

4. Conclusion

Within the study sample, the paddy insecticide market in Wanaparthy district is dominated by a small number of brands with a long market presence, and farmers' overall perception favoured the most established brand across most attributes, particularly price, ease of application and dealer support. Even so, a recently introduced brand recorded the second-highest overall perception score among seven brands and was rated highest of all on safety, indicating that farmers can form a favourable view of a new product relatively quickly when it is clearly differentiated on a specific attribute. The statistically significant differences confirmed by the one-way ANOVA show that these perception gaps are systematic within the sample rather than incidental, and that they are shaped jointly by effectiveness, safety, ease of use, price and dealer support.

5. Implications and Suggestions

Awareness-building: Field demonstrations and farmer training may help a newer brand close gaps in recall and perception relative to established brands, without overstating claims beyond what farmers have themselves reported.

Price/value positioning: The frequency with which cost-related concerns were reported suggests that affordability, pack-size options, or clearer communication of value per

acre may merit attention.

Dealer availability: Expanding dealer coverage and ensuring consistent stock availability could reduce access-related constraints reported by users.

Farmer education: Clear communication on correct dosage and application timing may help address the information gaps reported by a substantial share of users.

Evidence-based communication: Safety and effectiveness were the more favourable perception attributes for the newer brand in this sample and can be communicated factually, based strictly on what respondents reported.

6. Limitations

The findings are based on farmers selected from eight villages in four mandals of Wanaparthy district and describe the study sample rather than the entire Telangana insecticide market. Farmer-use responses were multiple-response in nature, so brand-related percentages are not mutually exclusive across brands. The perception analysis uses self-reported Likert-scale responses and should be interpreted as perceived rather than experimentally measured product performance. This article reports only the farmer-perception component of a larger dissertation; the accompanying market-structure, dealer-network and brand-equity analysis, which draws on additional commercial data, is reported separately and is not part of the present findings.

References

1. Dhamsania J, Patel B. Farmers purchasing behaviour, problems and preference towards agrochemicals. *Advanced Research*. 2025;26(5):399-407.
2. Food and Agriculture Organization of the United Nations. Rice market monitor. Rome: Food and Agriculture Organization of the United Nations; 2024.
3. Harish M, Vani S, Sarada OR, Kumari L. Identifying the factors influencing brand preference for pesticides in Guntur district. *Andhra Pradesh Journal of Agricultural Sciences*. 2023;9(3):223-226.
4. Kannan N, Parasuraman B, Kannan M. Farmers perception towards branded crop protection chemicals (CPC) in Tamil Nadu. *Madras Agricultural Journal*. 2025;112:23-30.
5. Kothari CR. Research methodology: methods and techniques. 2nd ed. New Delhi: New Age International Publishers; 2004.
6. Mahajan G, Timsina J, Singh K. Rice production and cultivation practices in Asia. *Advances in Agronomy*. 2017;143:1-52.
7. Ministry of Agriculture and Farmers Welfare, Government of India. Annual report. New Delhi: Government of India; 2024.