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Evaluating grape growers' brand awareness and market share dynamics of pesticide and fungicide brands

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Abstract
This research examines the awareness, preferences, and market dynamics of pesticide and fungicide brands among grape growers in Chikkaballapura, Karnataka. Data were collected from 60 grape growers and 20 agri-input retailers, focusing on factors influencing buying behavior, market share, and brand awareness. Syngenta India Ltd. and Bayer Crop Science emerged as market leaders, with RidomilGold and Confider being the most preferred brands due to their efficacy. Market share analysis shows Syngenta India Ltd. leading with 24.74%, followed by Bayer Crop Science at 21.08%. For insecticides, Confider and Tracer dominate preferences, reflecting their strong market presence. The study highlights that retailer recommendations (mean score: 78.46), product effectiveness (74.43), and brand popularity (65.63) are critical factors in purchasing decisions. Significant challenges include the prevalence of Downy Mildew and Thrips among grape crops. Findings reveal a 100% awareness of Ridomil Gold, Syscon, and Sectin fungicides, and 95% awareness of Confider insecticide. Adoption levels of pest and disease management practices were low for 46.66% of growers. Policy recommendations emphasize enhancing retailer training, promoting effective and safe agrochemicals, strengthening supply chains, increasing farmer awareness programs, and supporting smaller agrochemical companies. These strategies aim to ensure sustainable and productive grape cultivation in the region, providing valuable insights for policymakers and agrochemical companies.

Keywords: Grape growers, pesticide & fungicide awareness, market share, buying behaviour and retailer influence

Introduction
India, an agrarian nation, supports over 50% of its population through agriculture, leading globally in spices, pulses, milk, and more, while ranking second in wheat, rice, and other staples. Agrochemicals are crucial in preventing 20-40% crop losses due to pests and diseases, enhancing yields and food quality (Anon. 2018) [6]. India ranks fourth globally in agrochemical production and is a major exporter (Anon. 2019) [2]. Grapes, a historically significant crop, provide essential nutrients and have been cultivated since ancient times. Grape cultivation in Maharashtra spans 45.1 thousand hectares, yielding 1,275 thousand tons annually with a productivity of 28.3 tons per hectare (Anon. 2018) [5]. Karnataka, while having a smaller cultivation area of 9,700 hectares, produces approximately 1.67 lakh tons of grapes, with a productivity of around 17.3 tons per hectare (Anon. 2018) [3]. Maharashtra's larger production is due to both a greater cultivation area and higher productivity rates, reflecting more intensive agricultural practices.

India's agrochemical consumption stands at about 61,702 tons annually, which constitutes approximately 2% of global consumption. This usage is categorized into insecticides (36.3%), herbicides (15.0%), fungicides (35.5%), and bio-pesticides (11.9%) (Anon. 2019) [2]. These chemicals play a crucial role in enhancing agricultural productivity by protecting crops from pests and diseases, thereby ensuring higher yields and better-quality produce. Their strategic application across diverse crops underlines their significance in sustaining and improving food security in India.

Understanding grape growers' awareness of pesticide and fungicide brands and their market shares in Chikkaballapura, Karnataka, is essential. This knowledge helps agrochemical companies refine their marketing strategies and products to better meet local growers' needs. It

also provides insight into market leadership and competitive dynamics, aiding in strategic planning. Moreover, assessing brand awareness can identify gaps in knowledge and usage patterns, guiding educational efforts for more effective pesticide and fungicide use (Anon, 2018) [1]. This leads to better crop protection, higher yields, and improved grape quality, benefiting both growers and the agrochemical sector. Ultimately, such evaluations enhance the sustainability and productivity of grape farming in the region (Anon, 2019) [2]. Given these considerations, the present study was designed with two primary objectives: to evaluate grape growers' awareness levels and purchasing behaviours regarding pesticide and fungicide brands, and to determine the market share of various pesticide and fungicide brands utilized by these growers.

Methodology

The study was conducted in Chikkaballapura district, a key grape-growing area in Karnataka, chosen to assess the awareness levels and purchasing behaviours regarding pesticide and fungicide brands, and their purchasing behaviour towards different pesticide and fungicide brands. The district's cropping pattern includes a net sown area of 202,704 hectares, with cereals and minor millets occupying 48.17%, fruits and vegetables 19.54%, pulses 12.91%, oil seeds 10.10%, and non-food crops 9.28% (Anon. 2019 & Anon. 2018) [2, 4].

To gather data, two taluks, Chikkaballapura and Sidlaghatta, were purposively selected due to their intensive usage of plant protection chemicals. From each taluk, six villages were randomly selected, and within each village, five grape growers were chosen using simple random sampling, resulting in a total sample size of 60 grape growers. Additionally, 20 pesticide and fungicide retailers from both taluks were randomly selected to study the market share of different brands.

Primary data were collected using structured schedules from farmers and retail trader respondents, focusing on awareness levels, buying behaviour, and market shares of different pesticide and fungicide brands. Secondary data on cultivation patterns, land use, and general district information were obtained from the Department of Agriculture's website, Chikkaballapura. This comprehensive data collection approach ensured reliability and validity.

The data collected from grape growers and retailers were analysed by computing frequencies, percentages, and means to understand the market share of different fungicide and pesticide companies. Brand awareness and preferences were presented in percentages, and the share of each firm was calculated as a percentage of the total. Tabular analysis was used to examine purchase and sales patterns, as well as the adoption of pest and disease management technologies, and to document constraints faced by grape growers in using different plant protection chemicals.

Results and Discussion

Personal characteristics of grape growers: The data presented in Table 1 reveals the demographic / personal characteristics of grape growers in Chikkaballapura district. The age distribution shows that a majority of grape growers (51.67%) fall into the middle age category (35-50 years), followed by younger growers (28.33%) and older growers (20%). This indicates a predominantly experienced and active workforce engaged in grape cultivation, with a significant proportion being in their prime working years. Education levels among grape growers vary, with a notable proportion (36.66%) having completed high school education. A combined 31.67% have either primary or middle school education, and 28.33% have pursued education beyond high school, including PUC, graduation, and post-graduation. The presence of higher education levels among nearly a third of the growers suggests potential receptiveness to advanced agricultural practices and technology. Family size is predominantly medium, with 63.34% of growers having 5-8 members. This is followed by large families (21.66%) and small families (15%). The prevalence of medium-sized families might influence the division of labor and decision-making processes within the households, impacting grape farming activities and responsibilities. The area under grape cultivation shows that more than half of the growers (58.33%) manage 2.5 to 5 acres, while 28.34% cultivate less than 2.5 acres, and a smaller segment (13.33%) cultivates over 5 acres. This distribution indicates a dominance of small to medium-sized grape farms, which might face different challenges and opportunities compared to larger farms. Experience in grape cultivation reveals that 55% of growers have over 20 years of experience, highlighting a substantial base of seasoned farmers. Meanwhile, 31.66% have 10-20 years of experience, and 13.34% have less than 10 years. This extensive experience base is likely to contribute to expertise in managing grape production and dealing with agricultural challenges.

In summary, the grape growers in Chikkaballapura district are predominantly middle-aged, well-educated, and experienced. They mostly manage medium-sized farms with substantial knowledge and expertise in grape cultivation. These characteristics provide a foundation for understanding their preferences, behaviours, and potential receptiveness to new agrochemical products and practices.

Personal characteristics of input retailers: The analysis of input retailers personal characteristics in the study area are presented in Table 2. The result reveals that the majority are relatively young, with 55% falling within the 31-40 age bracket, and another 20% being up to 30 years old. This youthful demographic indicates a dynamic and potentially progressive market environment. Most retailers (55%) hold a graduation degree, suggesting a high level of education which could contribute to their business acumen and ability to adopt new technologies and practices. In terms of experience, a significant portion (45%) of retailers have been in the agri-input business for 10-20 years, while 35% have up to 10 years of experience. This mix of seasoned and newer retailers highlights a blend of traditional knowledge and fresh perspectives, which can be beneficial for innovation and adaptability in the market.

Retailers' educational backgrounds and considerable experience are crucial in influencing farmers' purchasing decisions, ensuring that they can provide informed advice and support. This combination of youth, education, and experience positions these retailers as key players in the adoption of advanced pest and disease management technologies, ultimately contributing to improved agricultural productivity and sustainability in the region.

Table 1: Personal characteristics of grape growers (n=60)

Sl. No.	Characteristics	Frequency	Percentage
1.	**Age (years)**		
a)	Young (Up to 35)	17	28.33
b)	Middle (35-50)	31	51.67
c)	Old (More than 50)	12	20.00
2.	**Education level (years)**		
a)	Illiterate	7	11.67
b)	Primary school	9	15.00
c)	Middle school	5	8.34
d)	High school	22	36.66
e)	PUC	12	20.00
f)	Graduation	4	6.66
g)	PG	1	1.67
3.	**Family size**		
a)	Small (Up to 4 members)	9	15.00
b)	Medium (5-8 members)	38	63.34
c)	Big (>8 members)	13	21.66
4.	**Area under grapes**		
a)	<2.5 acre	17	28.34
b)	2.5 acre to 5 acre	35	58.33
c)	>5 acre	8	13.33
5.	**Experience in grape cultivation(years)**		
a)	Less than 10	8	13.34
b)	Between 10-20	19	31.66
c)	More than 20	33	55.00

Table 2: Personal characteristics of input retailers (n=20)

Sl. No.	Characteristics	Frequency	Percentage
1.	**Age (years)**		
a)	Up to 30	4	20.00
b)	31-40	11	55.00
c)	41-50	3	15.00
d)	More than 50	2	10.00
2.	**Education level (years)**		
a)	High school	4	20.00
b)	PUC	5	25.00
c)	Graduation	11	55.00
3.	**Experience in agri-input business (years)**		
a)	Up to 10	7	35.00
b)	Between 10-20	9	45.00
c)	More than 20	4	20.00

Nature of Ownership of Agri-Input Retailers: The data in Table 3 reveals nature of ownership of agri-input retailers. The majority of agri-input retail businesses in the study area operate as sole proprietorships (85%). This suggests a preference for individual ownership, possibly due to the flexibility and control it offers. Only 15% of the retailers operate under a partnership model, which may indicate fewer collaborative ventures in this sector. Understanding the ownership structure can help in devising targeted support and policies to enhance the efficiency and growth of these businesses. Sole proprietors might benefit from initiatives focused on individual business management, while partnerships might gain from programs emphasizing collaboration and shared resources.

Table 3: Classification of agri-input retailing based on nature of ownership (n=20)

Sl. No.	Nature of ownership	Numbers	Percentage to the total
1.	Partnership	3	15.00
2.	Sole-proprietorship	17	85.00
	Total	20	100.00

Prevalence of diseases and pests in grape crop: The data in Table 4 reveals the prevalence of diseases and pests affecting grape crops in Chikkaballapura district, Karnataka. The study shows that all surveyed farmers (100%) reported Downy Mildew and Powdery Mildew as major diseases. These findings align with previous research, which highlights these diseases as significant threats to grape production due to their ability to rapidly spread and cause substantial yield losses (Keller, 2015) [13]. Anthracnose and blight were also prevalent, with 95% of farmers identifying them as major issues. This high percentage indicates the widespread impact of these fungal diseases on grape crops, which can lead to severe fruit damage and reduced marketability (Pearson & Goheen, 1988) [15].

Among insect pests, Thrips were reported by 80% of farmers, making them the most common insect issue. Thrips can cause significant damage by feeding on grape leaves and fruits, leading to reduced photosynthesis and compromised fruit quality (Bettiga, 2015) [9]. Mealybugs and Flea beetles were also prominent, with 71.66% and 61.66% of farmers reporting them, respectively. Mealybugs are known for their ability to transmit viruses, while Flea beetles feed on grape leaves and can cause defoliation and reduced vine vigor (Noubar *et al*., 2012) [14]. Stem borers (43.33%) and mites (36.66%) were less commonly reported but still pose significant threats, causing structural damage to vines and feeding on plant tissues (Flaherty *et al*., 1992) [10]. Leaf-eating caterpillars, reported by 36.66% of farmers, can also cause substantial defoliation and affect the overall health of grapevines (Johnson & Hogg, 2015) [12]. Understanding these pest and disease pressures is crucial for developing effective management strategies and ensuring the sustainability of grape production in the region. Continued research and extension services are necessary to provide farmers with the latest knowledge and tools to combat these challenges effectively.

Table 4: Prevalence of diseases and pests in grape crop (n=60)

Sl. No.	Problems	Number of farmers reporting this as major disease and pest*	Per cent
	Diseases		
1.	Downy Mildew	60	100.00
2.	Powdery Mildew	60	100.00
3.	Anthracnose and blight	57	95.00
	Insect Pests		
4.	Thrips	48	80.00
5.	Mealybugs	43	71.66
6.	Flea beetle	37	61.66
7.	Stem borer	26	43.33
8.	Mites	22	36.66
9.	Leaf eating caterpillar	22	36.66

Note: * Multiple responses were given by the respondent

Brand awareness of fungicides among grape growers

The data in Table 5 highlights the brand awareness of fungicides among grape growers in Chikkaballapura district. The results indicate that 100% of grape growers are aware of Ridomil Gold, Syscon, and Sectin, making them the most recognized brands in the region. This suggests strong market penetration and brand recall for these products, likely due to their effectiveness and widespread use in combating common grape diseases such as downy and powdery mildew. Curzate also shows high awareness at 95%, followed closely by Nimrod and Amister Top at 91.66%, and Melody Due at 90%. These brands are well-established and trusted for their fungicidal properties, reflecting their significant presence in the market and possibly aggressive marketing strategies. Matco, Luna Experience, and Merivon have awareness levels of 86.66%, 83.33%, and 80% respectively. This indicates that while these brands are well-known, there is still potential for increased market penetration and farmer education to enhance their usage. Master, Kavach, and Systhane show lower awareness levels at 75%, 73.33%, and 63.33% respectively. This suggests that these brands could benefit from more targeted marketing efforts and demonstration trials to improve their visibility and acceptance among grape growers. Sanchar, Equation Pro, and Contaf Plus have the lowest awareness levels, with 50%, 46.66%, and 43.33% respectively. These figures highlight the need for greater promotional activities and farmer engagement to raise awareness and encourage adoption of these fungicides. The similar kind of observations were identified by (Atar, *et al*., 2012) [8].

The overall high level of brand awareness among grape growers indicates a well-informed farming community, likely due to active outreach and education efforts by agrochemical companies and agricultural extension services. Furthermore, farmers are extensively focused on production aspects, keen observations on new advancements and high literacy rates makes them aware of brands.

Brand awareness of insecticides among grape growers

The data in Table 6 provides insights into the brand awareness of insecticides among grape growers in Chikkaballapura district. The findings show that Confider is the most recognized insecticide, with 95% of farmers being aware of it. This high level of awareness suggests strong market penetration and possibly effective marketing strategies for Confider. Karate follows closely with a 91.66% awareness rate, indicating it is also a well-known and trusted brand among grape growers. Acephate and Tracer are recognized by 86.66% and 83.33% of farmers, respectively, highlighting their significant presence in the market. Regent is known by 76.66% of growers, showing a good level of awareness, though slightly lower than the top brands. Rogor is recognized by 63.33% of farmers, suggesting there is room for improvement in its market reach and visibility. Delegate, with 45% awareness, is the least recognized insecticide among the surveyed growers. This indicates a need for increased promotional activities and educational efforts to raise awareness and adoption of Delegate among grape farmers.

Overall, the high levels of brand awareness for most insecticides indicate a well-informed farming community, likely supported by active outreach from agrochemical companies and agricultural extension services.

Table 5: Brand awareness of fungicides among grape growers (n=60)

Sl. No.	Fungicides	Frequency	Per cent
1.	RidomilGold	60	100.00
2.	Syscon	60	100.00
3.	Sectin	60	100.00
4.	Curzate	57	95.00
5.	Nimrod	55	91.66
6.	Amister Top	55	91.66
7.	Melody Due	54	90.00
8.	Matco	52	86.66
9.	Luna Experience	50	83.33
10.	Merivon	48	80.00
11.	Master	45	75.00
12.	Kavach	44	73.33
13.	Systhane	38	63.33
14.	Sanchar	30	50.00
15.	Equation pro	28	46.66
16.	Contaf plus	26	43.33

Note: Multiple responses were given by the single farmer

Table 6: Brand awareness of insecticides among grape growers (n=60)

Sl. No.	Insecticides	Frequency	Per cent
1.	Confider	57	95.00
2.	Karate	55	91.66
3.	Acephate	52	86.66
4.	Tracer	50	83.33
5.	Regent	46	76.66
6.	Rogor	38	63.33
7.	Delegate	27	45.00

Note: Multiple responses were given by the single farmer

Factors influencing farmers buying behaviour of pesticide and fungicide brands

The factors influencing grape growers' buying behavior of pesticides and fungicides in Chikkaballapura district are presented in Table 7. The analysis shows that the most significant factor is the recommendation by retailers, with a mean score of 78.46. This underscores the critical role that retailers play as trusted advisors to farmers, influencing their purchasing decisions through direct interactions and credible information. Effectiveness for immediate control of diseases is the second most influential factor, with a mean score of 74.43. This highlights the importance growers place on the efficacy of pesticides and fungicides in managing crop health and protecting yields. The popularity of the product brand follows with a mean score of 65.63, indicating that well-known and reputable brands have a competitive edge in the market.

Timely availability of products, previous experience with them, and opinions from other farmers are also important, with mean scores of 63.46, 54.66, and 53.33, respectively. These factors emphasize the need for reliable supply chains, positive past experiences, and peer recommendations in shaping purchasing decisions. Moderately ranked factors include credit availability (44.01), product price (41.73), recommendations from the Karnataka State Department of Horticulture (40.58), and company advertisements (38.66). These aspects, while not as influential as the top factors, still play a role in decision-making processes. Attractive packaging, with the lowest mean score of 29.00, appears to have minimal impact on purchasing decisions,

suggesting that functional attributes of the products are prioritized over aesthetic considerations. The findings are in line with the findings of Hosurkar and Kerur (2018) [11].

This comprehensive understanding of the factors influencing buying behaviour can help agrochemical companies and policymakers tailor their strategies to better meet the needs and preferences of grape growers in the region.

Table 7: Factors influencing farmers buying behaviour of pesticide and fungicide brands (n=60)

Sl. No.	Factors	Mean score	Garrett Ranking
1.	Retailer recommendation	78.46	I
2.	Effectiveness	74.43	II
3.	Brand popularity	65.63	III
4.	Timely availability	63.46	IV
5.	Previous experience	54.66	V
6.	Other farmer opinion	53.33	VI
7.	Credit availability	44.01	VII
8.	Price of the product	41.73	VIII
9.	KSDH recommendation	40.58	IX
10.	Advertisement by company	38.66	X
11.	Attractive packaging	29.00	XI

Fungicide brands preferred by grape growers

The study of fungicide brand preferences among grape growers in Chikkaballapura district reveals notable insights. From the data in Table 4.8, it is clear that RidomilGold and Syscon are the most preferred brands, with 100% of farmers selecting them. This indicates their high effectiveness and strong market presence. Nimrod (91.66%) and Melody Due (90%) follow closely, suggesting their reliability in controlling grape diseases. Curzate, Luna Experience, and Matco, with 83.33%, 80%, and 80% preference respectively, are also popular due to their performance and availability. Merivon (78.33%) and Master (73.33%) show significant farmer approval, highlighting their effectiveness in disease management. Systhane, with a 63.33% preference, completes the top list of favored fungicides.

Farmers' choices are influenced by multiple factors, including the quick disease control offered by these brands and their easy availability in the market. The visible and convincing impact of these chemicals further solidifies their popularity among growers. The strong preference for these fungicides underscores the importance of effectiveness, availability, and brand reliability in influencing purchasing decisions in the grape farming community.

Table 4.8: Fungicide brands preferred by grape growers (n=60)

Sl. No.	Fungicides	Frequency	Per cent
1.	RidomilGold	60	100.00
2.	Syscon	60	100.00
3.	Nimrod	55	91.66
4.	Melody Due	54	90.00
5.	Curzate	50	83.33
6.	Luna Experience	48	80.00
7.	Matco	48	80.00
8.	Merivon	47	78.33
9.	Master	44	73.33
10.	Systhane	38	63.33
11.	Sectin	35	58.33
12.	Amister Top	30	50.00
13.	Kavach	28	46.66
14.	Sanchar	26	43.33
15.	Contaf plus	24	40.00
16.	Equation pro	21	35.00

Note: Multiple responses were given by the single farmer

Insecticide brands preferred by grape growers

The preferences for insecticide brands among grape growers in Chikkaballapura district, as shown in Table 9, reveal interesting trends. Confider is the most preferred insecticide, with 91.66% of farmers reporting its use. This high level of preference indicates its perceived effectiveness and reliability among the growers. Karate follows with an 83.33% preference, signifying strong market presence and trust in its efficacy. Acephate, with a 78.33% preference, also ranks high, showing it is a commonly used and trusted brand for managing insect pests in grape vineyards. Tracer, preferred by 73.33% of the farmers, is another popular choice, highlighting its effectiveness in pest control. Regent and Rogor, with 55% and 46.66% preferences respectively, also demonstrate significant use among grape growers, though to a lesser extent compared to the top brands. Delegate, with the lowest preference at 26.66%, indicates it is less favored among the farmers surveyed. This could be due to factors such as perceived effectiveness, availability, or price. The findings were different from the findings of Srividyarani, and Kerur (2018) [16].

Overall, the strong preferences for Confider, Karate, Acephate, and Tracer suggest that these brands have established a solid reputation for controlling insect pests effectively in grape cultivation. The data highlights the importance of efficacy, reliability, and market presence in shaping farmers' preferences for insecticide brands.

Table 9: Insecticide brands preferred by grape growers (n=60)

Sl. No.	Insecticides	Frequency	Per cent
1.	Confider	55	91.66
2.	Karate	50	83.33
3.	Acephate	47	78.33
4.	Tracer	44	73.33
5.	Regent	33	55.00
6.	Rogor	28	46.66
7.	Delegate	16	26.66

Note: Multiple responses were given by the single farmer

Market share of different brands of pesticides and fungicides used by grape growers

Market share of different brands of fungicides used by grape growers: The data presented in Table 10 highlights the market share of different fungicide brands used by grape growers in Chikkaballapura district. Syngenta India Ltd. emerges as the market leader, capturing a substantial 24.74% share through its brands RidomilGold (18.10%), Amister Top (4.20%), and Kavach (2.44%). The company's broad product portfolio, strong brand acceptance, innovative production, and effective marketing strategies contribute to its leading position. Bayer Crop Science follows with a 21.08% market share, driven by brands like Luna Experience (8.75%), Melody Due (7.68%), and Sectin (4.65%). Adama India Ltd. holds 18.13% of the market, with significant contributions from Nimrod (9.92%) and Syscon (8.21%). DuPont India Ltd. and Indofil Chemical Company also have notable shares at 8.95% and 7.12%, respectively, with products like Curzate and Matco. BASF India Ltd., Dow AgroSciences India Ltd., Rallis India Ltd., and Biostadt India Ltd. hold smaller market shares of 6.06%, 4.12%, 4.03%, and 2.87%, respectively. Brands such as Merivon, Systhane, and Sanchar play key roles for these companies. The dominance of Syngenta India Ltd. and Bayer Crop Science can be attributed to their extensive product ranges, effective disease control, and strong market presence. Despite the availability of various fungicide brands, growers demonstrate high loyalty towards

these leading brands due to their proven efficacy and reliability in managing grape diseases.

Market share of different brands of insecticides/pesticides used by grape growers: The market share of different insecticide brands used by grape growers in Chikkaballapura district, as detailed in Table 11, highlights a competitive landscape. Confider, manufactured by Bayer Crop Science, leads the market with a substantial 28.04% share, attributed to its proven efficiency in controlling grape pests. Tracer, by Dow AgroSciences India Ltd., follows with an 18.17% share, indicating strong performance and farmer preference. Acephate from Rallis India Ltd. holds a 12.12% market share, and Karate from Syngenta India Ltd. follows closely at 11.56%. These figures reflect the efficacy and popularity of these brands among grape growers. Regent (Bayer Crop Science) and Delegate (Dow AgroSciences India Ltd.) have market shares of 8.60% and 7.95%, respectively, while Rogor from Rallis India Ltd. holds a smaller share of 2.48%. Other brands collectively account for 11.08% of the market, indicating a fragmented space with several minor players. The high market shares of leading brands suggest strong brand loyalty and effective marketing strategies. The stiff competition among top insecticide companies emphasizes the importance of product efficacy, availability, and marketing efforts in influencing farmers' purchasing decisions. These insights can help agrochemical companies refine their strategies to better meet the needs and preferences of grape growers, ultimately supporting sustainable and productive grape cultivation. The market share of crops varies based on locality as compared to Venkateswaran, et. Al., (2011) [17] findings.

Table 10: Market share of different brands of fungicides used by grape growers (n=20)

Sl. No.	Brand	Company	Average sales/ retailer/year (Rs. Lakhs)	Percentage share
1.	RidomilGold	Syngenta India Ltd.	8.59	18.10
2.	Nimrod	Adama India Ltd.	4.71	9.92
3.	Luna Experience	Bayer crop science	4.15	8.75
4.	Syscon	Adama India Ltd.	3.90	8.21
5.	melody Due	Bayer crop science	3.65	7.68
6.	Curzate	DuPont India Ltd.	3.53	7.43
7.	Matco	Indofil chemical company	3.38	7.12
8.	Merivon	BASF India Ltd.	2.88	6.06
9.	Master	Rallis India Ltd.	2.39	5.03
10.	Sectin	Bayer crop science	2.21	4.65
11.	Amister Top	Syngenta India Ltd.	1.99	4.20
12.	Systhane	Dow AgroSciences India Ltd.	1.96	4.12
13.	Sanchar	Biostadt India Ltd.	1.35	2.87
14.	Kavach	Syngenta India Ltd.	1.16	2.44
15.	Contaf plus	Rallis India Ltd.	0.90	1.90
16.	Equation pro	DuPont India Ltd.	0.72	1.52
		Total	47.47	100.00

Table 11: Market share of different brands of insecticides / pesticides used by grape growers (n=20)

Sl. No.	Brand	Company	Average sales/ retailer/year (Rs. Lakhs)	Percentage share
1.	Confider	Bayer crop science	4.63	28.04
2.	Tracer	Dow AgroSciences India Ltd.	3.00	18.17
3.	Acephate	Rallis India Ltd.	2.00	12.12
4.	Karate	Syngenta India Ltd.	1.91	11.56
5.	Regent	Bayer crop science	1.42	8.60
6.	Delegate	Dow AgroSciences India Ltd.	1.31	7.95
7.	Rogor	Rallis India Ltd.	0.41	2.48
8.	Others	Others	1.83	11.08
		Total	16.51	100.00

Table 12: Market share of plant protection chemical companies (n=20)

Sl. No.	Company	Average sales/ retailers/ year (Rs. Lakhs)	Percentage share
1.	Bayer crop science	16.06	25.10
2.	Syngenta India Ltd.	13.65	21.33
3.	Adama India Ltd.	8.61	13.45
4.	Dow AgroSciences India Ltd.	6.27	9.80
5.	Rallis India Ltd.	5.70	8.91
6.	DuPont India Ltd	4.25	6.64
7.	Indofil chemical company	3.38	5.28
8.	BASF India Ltd.	2.88	4.50
9.	Biostadt India Ltd.	1.35	2.11
10.	Others	1.83	2.88
	Total	63.98	100.00

Market share of plant protection chemical companies: Table 12 highlights the market share of various plant protection chemical companies based on average annual sales per retailer. Bayer Crop Science leads the market with a 25.10% share, attributed to strong brand recognition and a wide range of effective products. Syngenta India Ltd. follows with a 21.33% share, demonstrating its significant presence and competitive marketing strategies. Adama India Ltd. holds a 13.45% share, indicating its established position in the market. Dow AgroSciences India Ltd. and Rallis India Ltd. have shares of

9.80% and 8.91%, respectively, showcasing their role in the agrochemical sector. DuPont India Ltd. captures a 6.64% share, while Indofil Chemical Company holds 5.28%, both reflecting their contributions to plant protection. BASF India Ltd. and Biostadt India Ltd. have smaller market shares of 4.50% and 2.11%, respectively. The category "Others," encompassing various minor players, collectively holds a 2.88% share. This distribution underscores the dominance of major companies like Bayer and Syngenta, yet also highlights the competitive nature of the market with several other significant contributors.

Conclusion

This study provides a comprehensive analysis of grape growers' awareness, preferences, and market dynamics concerning pesticide and fungicide brands in Chikkaballapura district, Karnataka. The findings indicate that key factors influencing farmers' buying behavior include retailer recommendations, product effectiveness, and brand popularity. Syngenta India Ltd. and Bayer Crop Science dominate the market due to their extensive product portfolios and effective marketing strategies. Grape growers exhibit high brand loyalty towards these companies, with RidomilGold and Confider being the most preferred fungicide and insecticide brands, respectively. The presence of well-informed and educated farmers, along with experienced and strategically positioned retailers, further enhances the adoption of these leading brands.

To support the sustainable growth of the grape industry, policymakers should consider enhancing retailer training to improve their knowledge and advisory capabilities, ensuring they provide accurate and beneficial recommendations to farmers. Promoting the development and dissemination of highly effective and environmentally safe agrochemicals is essential, along with strengthening supply chains to guarantee the timely availability of quality agrochemicals, preventing crop loss, and enhancing productivity. Increasing awareness programs can educate farmers about the latest pest and disease management practices and the benefits of different brands. Additionally, supporting smaller agrochemical companies to diversify the market and offer competitive products is crucial. These measures can drive more informed and efficient use of agrochemicals, leading to improved crop yields and sustainable agricultural practices.

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