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Knowledge of Farmers Regarding PDKV Liquid Micro Grades

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The research study was conducted in Balapur and Akot talukas of Akola district of Maharashtra state. Twelve villages were selected on the basis of maximum number of farmers using PDKV liquid micro grades. From these villages, those respondents were selected who had been using PDKV liquid micro grades from last two year. Thus, 120 farmers constituted the sample for the study. The data were collected on knowledge of farmers regarding PDKV liquid micro grades.

The findings of the study revealed that, 56.67% of respondents belonged to high level of knowledge, while 41.67% of respondents belonged to medium level of knowledge and only 1.66% respondents having low level of knowledge regarding PDKV liquid micro grades. under study. Based on the findings, it has been established that, those respondents who has adopted it and use

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in their own field have knowledge about importance, its use for particular crop and method of application of PDKV liquid micro grades. Thus, there is necessary efforts should be made to popularize this product among the general farmers by the concern agencies.

Keywords: Knowledge; micronutrients; PDKV liquid micro grades; fertilizer.

1. INTRODUCTION

Agriculture, as the backbone of many economies, plays a crucial role in ensuring food security and sustaining livelihoods. One of the key determinants of agricultural productivity is the availability of essential nutrients that support the growth and development of crops. Micronutrients, though required in smaller quantities compared to macronutrients, are indispensable for plant health and overall crop yield. Deficiencies in micronutrients such as zinc, iron, copper, manganese, and boron can severely impede crop growth, leading to reduced yields and compromised nutritional quality (Kumar, 2004, Sunilkumar, 2017).

Recognizing the pivotal role of micronutrients in optimizing crop production, Dr.Panjabrao Deshmukh Krishi Vidyapeeth has developed a specialized liquid micronutrient fertilizer known as PDKV liquid micro grades(Verma, 2019). This innovative product aims to address micronutrient deficiencies effectively, offering a targeted solution to enhance crop yield and quality (Falke et al., 2023, Jejal et al., 2024, Rodhe, 2020). The formulation of PDKV liquid micro grades is designed to provide a balanced supply of micronutrients, tailored to the specific needs of diverse crops(Shinde et al., 2024). Now a day the farmers are well aware about the micronutrients available in the market manufactured by different companies (Shinde et al., 2024). Meanwhile Dr. PDKV, Akola has also prepared three different grades of micronutrients and made available to the farmers from last two years. Dr. PDKV, Akola is trying to provide the trustworthy products to the farmers to increase the yield. The present investigation was undertaken with specific objective viz., to study the knowledge of farmers regarding PDKV liquid micro grades.

1.1 Micronutrient Grades Prepared by DR. PDKV, Akola

There are three different types of the grades prepared by Department of Soil Science and Agricultural Chemistry, Dr. PDKV, Akola.

1. PDKV Liquid Micro Grade II-

Used for vegetables, cereals, pulses and fruit crops(Sihare, 2015).

Component: iron-25%, zinc-2%, boron-0.5%, manganese-1%, copper-1%, molybdenum-0.1%

2. PDKV Liquid Micro Grade X-

Used for pulses.

Component: iron-2.5%, zinc-5%, boron-0.5%, molybdenum-0.1%

2. PDKV Liquid Micro Grade XI-

Used for cotton crops.

Component- iron-2.5%, zinc-5%, boron-0.5

The present investigation was planned to assess knowledge of farmers towards utility of PDKV liquid micro grades.

2. METHODOLOGY

The present investigation was conducted in Akola district of Maharashtra. On the basis of maximum number of farmers using PDKV liquid micro grades, two tahsils namely, Balapur and Akot were selected for the study. For this study, a list of villages using PDKV liquid micro grades was collected from Department of Soil Science and Agricultural Chemistry, Dr. PDKV, Akola. From this list, on the basis of maximum number of farmers using PDKV Liquid Micro Grades within a village were selected from Akot and Balapur taluka. Accordingly, 6 villages from each taluka were selected. From each village 10 farmers and thus, total 120 respondents selected for the study, who had been using PDKV Liquid Micro Grades from last two year. The exploratory research design of social research was used. Knowledge of farmers regarding PDKV Liquid Micro Grades was measured with the help of schedule prepared with assistance of experts. The statements of the schedule were developed and total statements were about 15. Responses of the respondents were measured on two-point continuum as yes and no and it was scored as 1 and 0, respectively. Finally score for all items of knowledge scale for individual respondent was

summed up to obtain total score. The knowledge score was converted into knowledge index with help of following formula.

Knowledge Index =

$$\frac{\text{Actual obtained knowledge score}}{Maximum\ obtainable\ knowledge\ score} \times 100$$

On the basis of equal interval method, the respondents were categorized into three categories as low, medium and high.

3. RESULTS AND DISCUSSION

Personal, socio-economic, communicational, psychological and situational characteristics of the farmers who used PDKV Liquid Micro Grades: The data presented in Table 1 that, 57.50% of respondents belonged to middle age group (ranging from 36 to 50 years), followed by 25.00 per cent and 17.50% of respondents belonged to young age group (up to 35 years) and old age group (Above 50 years), respectively. 35.00% of the respondents had received education up to the secondary school level, while 33.33% had completed their education up to higher secondary school. 33.33% of the respondents had an annual income in range of Rs. 2,35,781 to Rs. 4,05,960, followed by 30.84% of the respondents whose annual income fell in the range of Rs. 4,05,961 to Rs. 5,76,140. 44.17% of farmers had semi-medium sized land holdings, while 38.33 per cent possessed medium-sized land holdings. Majority (65.83%) of farmers follow both Kharif and Rabi season cropping pattern. More than half (56.67%) of the respondent relied on wells/ tubewells as their primary source of irrigation. 44.17% of the farmers possessed a medium level of information sources, followed by, 30.00 and 25.83% of farmers had a low level and high level of information sources. Largest proportion of respondents (66.67%) reported having a medium level of extension contact, followed by high-level contact (17.50%) and low-level contact (15.83%). Majority (62.50%) of respondents exhibited a medium level of innovativeness, followed by higher level of innovativeness (29.17 %) and low level of innovativeness (8.33%). 59.17% of the respondents demonstrated a medium level of scientific orientation, while 30.83% of the respondents exhibited a high level of scientific orientation and only 10.00% of respondents had a low level of scientific orientation.

Knowledge of farmers regarding PDKV Liquid Micro Grades: Knowledge refers to a kind of understood information possessed by an individual (English and English, 1961). Operationally, knowledge is defined as the amount of information possessed by the respondents about PDKV Liquid Micro Grades. The information regarding the knowledge of farmers regarding PDKV Liquid Micro Grades was collected, tabulated and analyzed.

From Table 2, the statement wise distribution of respondents observed that, the statements like, PDKV Liquid Micro Grade X is use for Pulses only, PDKV Liquid Micro Grades are applied through foliar spray, PDKV Liquid Micro Grades should not be mix with chemical fertilizers, insecticides and fungicides and PDKV liquid micro grade should be thoroughly mix with water before spraying are in agreement with the percentage of 100 per cent.

The statements like For spraying of PDKV liquid micro grade, knapsack sprayer should be used preferably, PDKV Liquid Micro Grade XI is use for cotton crop only, PDKV liquid micro grade helps in mitigating the micronutrient deficiency in the soil for plant growth, PDKV Liquid fertilizer has three different types of grades, PDKV Liquid Micro Grade II is use for vegetables, cereals, pulses and fruit crops and Spraying of PDKV Liquid Micro Grade should be done before 11 in the morning and after 4 in the afternoon are in agreement with the percentage of 97.50 per cent, 95.00 per cent, 94.17 per cent, 91.67 per cent, 90.83 per cent and 90.83 per cent, respectively.

The statements like, PDKV Liquid Micro Grade spraying is done twice, 50 ml at branch growth stage and 100 ml per 10 litres of water at flowering stage, For spraying of PDKV liquid micro grade by power spray, the quantity should be doubled, PDKV Liquid Micro Grades has waiting period of 4-5 days, Micronutrients help in increasing uptake of major nutrients from the soil required for plant growth and Use of micronutrients is recommended for basic soils for increase in yield are in agreement with the percentage of 90 per cent, 90 per cent, 87.50 per cent, 83.33 per cent and 61.67 per cent, respectively.

From Table 2, concluded that, 38.33 per cent and 10 per cent of the respondents don't have knowledge about statements like use of micronutrients is recommended for basic soils for increase in yield, for spraying of PDKV liquid micro grade by power spray, the quantity should be doubled. In spite of this, they are still using PDKV Liquid Micro Grades due to their relatives and friend's suggestions.

Table 1. Personal, socio-economic, communicational, psychological and situational characteristics of the farmers who used PDKV Liquid Micro Grades

Sr. No.	Particulars	Frequency(n=120)	Percentage
1.	**Age**		
	Young (up to 35)	30	25.00
	Middle (36 to 50)	69	57.50
	Old (above 50)	21	17.50
2.	**Education**		
	Illiterate (no school)	00	00.00
	Primary school (1^{st} to 4^{th})	06	05.00
	Middle school (5^{th} to 7^{th})	12	10.00
	Secondary school (8^{th} to 10th)	42	35.00
	Higher secondary school (11^{th} to 12^{th})	40	33.33
	Graduate and above (above 12^{th})	20	16.67
3.	**Annual income**		
	Upto Rs. 2,35,780/-	19	15.83
	Rs. 2,35,781 to Rs. 4,05,960 /-	40	33.33
	Rs. 4,05,961 to Rs. 5,76,140/-	37	30.84
	Rs. 5,76,141 to Rs. 7,46,320/-	16	13.33
	Above Rs. 7,46,320/-	8	06.67
4.	**Land holding**		
	Marginal (Up to 1.00 ha)	06	05.00
	Small (1.01 to 2.00 ha)	09	07.50
	Semi-medium (2.01 to 4.00 ha)	53	44.17
	Medium (4.01 to 10.00 ha)	46	38.33
	Large (Above 10.00 ha)	06	05.00
5.	**Cropping pattern**		
	Kharif	36	30.00
	Kharif + Rabi	79	65.83
	Kharif + Rabi + Summer	05	04.17
6.	**Sources of irrigation**		
	No source	43	35.83
	River	00	00.00
	Well/ Tubewell	68	56.67
	Canal	05	04.17
	Farm pond	04	03.33
7.	**Sources of information**		
	Low (Up to 08.21)	36	30.00
	Medium (08.21 to 09.71)	53	44.17
	High (Above 09.71)	31	25.83
	Mean = 8.96SD = 0.75		
8.	**Extension contact**		
	Low (Up to 3.62)	19	15.83
	Medium (3.62 to 6.34)	80	66.67
	High (Above 6.34)	21	17.50
	Mean = 4.98SD = 1.36		
9.	**Innovativeness**		
	Low (Up to 9.72)	10	08.33
	Medium (9.72 to 14.76)	75	62.50
	High (Above 14.76)	35	29.17
	Mean = 12.24SD = 2.52		
10.	**Scientific orientation**		
	Low (Upto 17.13)	12	10.00
	Medium (17.13 to 21.54)	71	59.17
	High (Above 21.54)	37	30.83
	Mean = 19.33SD = 2.21		

Table 2. Statement wise distribution of farmers according to their knowledge

Sr. No.	Statement	Yes	No
1.	Use of micronutrients is recommended for basic soils for increase in yield	74 (61.67)	46 (38.33)
2.	Micronutrients help in increasing uptake of major nutrients from the soil required for plant growth	100 (83.33)	20 (16.67)
3.	PDKV liquid micro grade helps in mitigating the micronutrient deficiency in the soil for plant growth	113 (94.17)	07 (05.83)
4.	PDKV Liquid fertilizer has three different types of grades	110 (91.67)	10 (08.33)
5.	PDKV Liquid Micro Grade II is use for vegetables, cereals, pulses and fruit crops	109 (90.83)	11 (09.17)
6.	PDKV Liquid Micro Grade X is use for Pulses only	120 (100.00)	00 (00.00)
7.	PDKV Liquid Micro Grade XI is use for cotton crop only	114 (95.00)	06 (05.00)
8.	PDKV Liquid Micro Grades are applied through foliar spray	120 (100.00)	00 (00.00)
9.	Spraying of PDKV Liquid Micro Grade should be done before 11 in the morning and after 4 in the afternoon	109 (90.83)	11 (09.17)
10.	PDKV Liquid Micro Grade spraying is done twice, 50 ml at branching stage and 100 ml per 10 litres of water at flowering stage	108 (90.00)	12 (10.00)
11.	PDKV Liquid Micro Grades should not be mix with insecticides and fungicides	120 (100.00)	00 (00.00)
12.	PDKV Liquid Micro Grades has waiting period of 4-5 days	105 (87.50)	15 (12.50)
13.	PDKV liquid micro grade should be thoroughly mix with water before spraying	120 (100.00)	00 (00.00)
14.	For spraying of PDKV liquid micro grade, knapsack sprayer should be used preferably	117 (97.50)	03 (02.50)
15.	For spraying of PDKV liquid micro grade by power spray, the quantity should be doubled	108 (90.00)	12 (10.00)

(Figures in parenthesis indicates percentage)

Table 3. Distribution of the respondents according to their level of knowledge

Sr. No.	Category	Respondents (n=120)	
		Frequency	Percentage
1.	Low (66.67 - 77.78)	02	01.66
2.	Medium (77.78 - 88.89)	50	41.67
3.	High (88.89 - 100)	68	56.67
	Total	**120**	**100.00**

Table 4. Relationship between personal, socio-economic, communicational, psychological and situational characteristics of respondents with their knowledge

Sr. No.	Characteristics	Correlation coefficient
1.	Age	0.109^{NS}
2.	Education	0.222*
3.	Annual income	0.064^{NS}
4.	Land holding	-0.062^{NS}
5.	Cropping pattern	0.266**
6.	Sources of irrigation	0.064^{NS}
7.	Sources of information	0.295**
8.	Extension contact	0.206*
9.	Innovativeness	0.231**
10.	Scientific orientation	0.193*

***Significant at 0.01 level of probability*
**Significant at 0.05 level of probability*
NS- Non-Significant

According to the data provided in Table 3, it noticed that, 56.67 per cent of the respondents demonstrated a high-level knowledge of PDKV Liquid Micro Grades, while 41.67 per cent of respondents exhibited a medium level of understanding and only 1.66 per cent displayed a low level of knowledge on the subject.

Based on the information presented in the Table 3, we concluded that, the majority of respondents fell into the category of high-level of knowledge. This implies that, most of the respondents have knowledge about PDKV Liquid Micro Grades. These results align closely with those reported by Madhuri Morey (2020) and PayalDahiwale (2020).

Relationship of characteristics of farmers with knowledge of farmers regarding PDKV Liquid Micro Grades: From Table 4, it is depicted that, cropping pattern, sources of information and innovativeness of farmers were found positive and highly significant with knowledge at 0.01 level of probability. Whereas, education, extension contact and scientific orientation were found positively significant with knowledge at 0.05 level of probability. The positive significant relationship shows that, when the level of the variables viz. education, cropping pattern, sources of information, extension contact, innovativeness and scientific orientation increases then the knowledge of farmers regarding PDKV Liquid Micro Grades will also increases. The variables age, annual income, land holding, and sources of irrigation were determined to have no significant relationship with knowledge.

This finding strongly suggested that, the majority of the chosen independent variables exhibit a notable and positive correlation with knowledge of farmers regarding PDKV Liquid Micro Grades.

4. CONCLUSION

The finding of the investigation revealed that, 56.67 per cent of the respondent were exhibited a high level of knowledge regarding PDKV Liquid Micro Grades, followed by, medium level of knowledge (41.67%) and only 1.66 per cent of the respondent were displaying a low level of knowledge regarding PDKV Liquid Micro Grades. The education, cropping pattern, sources of information, extension contact, innovativeness and scientific orientation had significant relationship with knowledge of farmers regarding PDKV Liquid Micro Grades. Whereas, age, annual income, land holding and sources of irrigation had non-significant relationship with knowledge of farmers regarding PDKV Liquid Micro Grades. Thus, the conclusion of the study is maximum number of respondents (98.34%) have knowledge about importance, its use for particular crop and method of application of PDKV Liquid Micro Grades. But these respondents or those who has adopted it and use in their own field. Hence, necessary efforts should be made to popularize this product among the general farmers by the concern agencies.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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