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## Insights from video analysis: Best weed control practices in rice

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### Abstract

Agriculture forms the backbone of the Indian economy, with rice being a staple food for a significant portion of the population. Despite its importance, India's rice productivity is hampered by various factors, notably weed infestations, which can lead to substantial yield losses. This study was conducted in Rupnagar, Punjab, to assess and enhance farmers' knowledge of weed management in rice cultivation through an educational video intervention. A total of 100 farmers from five randomly selected villages participated in the study, completing a questionnaire focused on weed control practices before and after viewing the video. The results demonstrated a significant increase in knowledge, with the mean percentage of correct responses rising from 50.81% before the intervention to 88.73% afterward, reflecting a percentage change of 74.63%. The findings highlight the effectiveness of multimedia educational resources in bridging knowledge gaps and enhancing agricultural practices among farmers. This study underscores the need for integrating similar educational interventions in agricultural training programs to promote sustainable farming practices.

**Keywords:** Weed management, educational intervention, multimedia resources, sustainable practices

### Introduction

The foundation of the Indian economy is agriculture. India's geographic location has proven ideal for agricultural endeavours. India's physical characteristics, including its climate, soil, and relief, have been extremely beneficial in the production of numerous crops. Therefore, agriculture has traditionally been the primary source of income for Indians (Rafie J, Kumar R, 2020) <sup>[1]</sup>. Increasing food productivity in developing nations, particularly India, will be crucial in the years to come. However, doing so necessitates figuring out workable answers to a number of intricate technical, institutional, and policy problems, such as land markets, agricultural extension, credit, storage connections to markets, rural nonfarm employment, agricultural extension, land markets, and stabilising food prices.

Rice (*Oryza sativa* L.), a staple food for over 60% of the world's population, is the most significant cereal and is widely farmed in tropical and subtropical countries (Nayar NM, 2014) <sup>[2]</sup>. Around 426 million tonnes of rice are produced annually on 154 million hectares of land worldwide, with an average yield of 3.9 t ha<sup>-1</sup>.

In India, rice is grown all year round in a variety of ecologies spanning 43.8 million hectares (Jagtap *et al.*, 2012) <sup>[3]</sup>. The country produces 85.3 million tonnes of rice annually, with an average yield of 2.96 t ha<sup>-1</sup>. However, India produces only 1,710 kg of rice per hectare. Its low output can be attributed to a number of factors, with weed-related losses ranking among the most significant. The most serious and pervasive biological barriers to crop productivity are weeds. The majority of grain crops are severely infested by weeds. In lowland and highland rice, unchecked weed growth can result in yield losses of 12–81% (Mukherjee and Singh, 2005) <sup>[4]</sup>. Both directly and indirectly, weed infestation lowers grain output. The growth and development requirements of rice and rice weeds are comparable. When one of the resources—nutrients, light, moisture, and space—does not meet the combined needs of weeds and rice, competition arises. Weeds take over the agricultural habitat and lower the potential yield because of their great adaptation and quick growth.

## Methodology

This study, conducted in Rupnagar, Punjab, aimed to assess and improve farmers' knowledge of weed control in rice cultivation across five randomly selected villages: Dhianpura, Dhanauri, Khairpur, Kakrali, and Dhangrali. A sample of 100 farmers participated, with varying numbers selected from each village. The research used a questionnaire with eleven questions on weed control to gauge the farmers' baseline knowledge and practices. The study took a two-phase approach, where each farmer completed the questionnaire twice—once before and once after watching an educational video on soil sampling. The video aimed to enhance farmers' understanding of soil

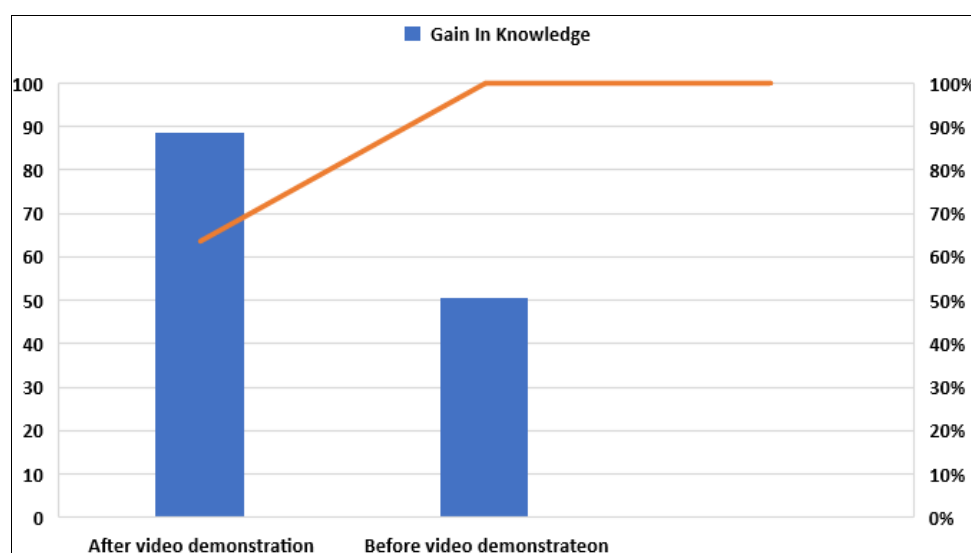
health and its role in effective weed management. Researchers conducted interviews in the farmers' fields or homes, allowing for a comfortable environment to encourage honest and practical responses. By comparing responses before and after the video, the study assessed the impact of visual learning on agricultural knowledge. This approach provided valuable insights into how informational media can potentially shift practices and improve knowledge in farming communities.

## Results and Discussion

Only 24% of respondents were not aware of soil testing, whereas the majority of respondents, or 76%, knew what the word meant.

**Table 1:** Demonstrates the no. of correct answers before and after showing the video clip

Questions	Before video demon strateon	After video demonstration
1. Whether farmer know about weeds of rice crop?	32(32%)	85(85%)
2. Do farmer knows about the organic management of Swank weed ?	50(50%)	89(89%)
3. Do farmer knows about the Motha weed?	46(46%)	85(85%)
4. Do farmer knows about the organic management of Motha weed?	42(42%)	92(92%)
5. Do farmer knows about the Kanki weed?	39(39%)	85(85%)
6. Farmers know the organic management of Kanki weed?	90(90%)	100(100%)
7. Do farmer knows about the Cheeni Gha weed?	32(32%)	91(91%)
8. Do farmer knows about the organic management of Cheeni Gha weed?	57(57%)	89(89%)
9. Do farmer knows about the harmful effects of weeds in rice crop?	40(40%)	75(75%)
10. Farmer using inorganic method for weed control?	88(88%)	90(90%)
11. Do farmer prefer crop rotation for weed management?	43(43%)	95(95%)
Mean	50.81	88.73%
Mean percentage	50.81%	88.73%
Percentage change	74.63	



**Fig 1:** Demonstrate of percentage increase in knowledge after watching video

The table presents a comprehensive comparative analysis of farmers' knowledge regarding various aspects of weed management in rice crops before and after a video demonstration. This study is designed to evaluate the effectiveness of educational interventions in enhancing agricultural knowledge, particularly focusing on the identification and management of specific weeds. Each question in the table addresses a critical area of knowledge, such as the recognition of particular weeds (e.g., Swank weed, Motha weed, Kanki weed, Cheeni Gha weed) and the understanding of their organic management techniques. The responses are provided in both absolute numbers and percentages, facilitating an easy interpretation of the data.

Before the video demonstration, the mean percentage of correct

answers among farmers was 50.81%, which indicates a moderate level of awareness regarding weed management practices. For instance, only 32% of farmers could accurately identify the weeds of rice crops, and knowledge about Kanki weed was similarly low at 39%. These figures suggest a significant gap in understanding that could potentially affect the farmers' ability to manage weeds effectively.

However, after the video demonstration, there was a remarkable shift in knowledge levels. The overall mean percentage of correct answers surged to 88.73%, reflecting substantial improvements across all questions. This increase underscores the effectiveness of the video as an educational tool. Notable gains were observed in specific areas, such as the organic management of Motha weed, which saw a rise from 42% to

92%, and awareness of Cheeni Gha weed, which increased from 32% to 91%. This indicates that the video not only conveyed information effectively but also resonated with the farmers, enhancing their understanding and retention of knowledge.

The overall percentage change of 74.63% highlights the positive impact of the video intervention on farmers' comprehension of weed management practices. Such a significant improvement suggests that multimedia educational resources can play a crucial role in bridging knowledge gaps in agricultural settings. The findings emphasize the importance of utilizing visual learning aids to improve farmers' knowledge and practices related to weed management, ultimately contributing to better agricultural outcomes and sustainability.

Moreover, these results advocate for the integration of similar educational interventions in agricultural training programs to enhance farmers' capabilities in managing weeds and other agricultural challenges. Future research could further explore the long-term retention of knowledge acquired from such demonstrations and examine their subsequent impact on farmers' practices, crop yields, and overall agricultural productivity. This could provide valuable insights into how continuous education and training can be optimized to foster sustainable agricultural practices among farmers.

### Conclusion

The findings of this study underscore the critical role of educational interventions in enhancing farmers' knowledge and practices related to weed management in rice cultivation. The significant increase in farmers' awareness—from a mean of 50.81% to 88.73%—demonstrates the effectiveness of using multimedia resources, such as educational videos, to convey complex agricultural concepts. The study reveals that addressing knowledge gaps through targeted educational efforts can lead to better management of weeds, ultimately improving crop yields and contributing to agricultural sustainability. Given the challenges faced by farmers in managing weeds, it is essential to integrate similar educational programs into agricultural training initiatives. Future research should focus on the long-term retention of knowledge acquired through such interventions and their impact on actual farming practices and productivity. By fostering continuous education and equipping farmers with the necessary tools and information, we can promote sustainable agricultural practices that enhance food security and economic stability in rural communities.

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