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Study of Effective Promotional Tools for Enhancing the Use of Pre-Emergence Herbicide in Paddy Crop

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This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

The article on title "Study of effective Promotional Tools for enhancing the use of Pre-Emergence Herbicide in Paddy Crop" was carried out under the guidance of Dr. NITIN BARKER. Paddy (*Oryza sativa*) is the major staple food for a large population of world's population especially in South and East Asia, 65% of the India's population major staple food is rice. Rice is an important source of food worldwide. However, the growth of weeds in paddy fields pose a major biological threat to higher rice productivity and quality. Weeds have many variable characteristics compared to the crop for examples lack of seed dormancy, uniform growth and high yields. Thus, weeds tend to show larger potential capacity to adapt to stress (e.g., climate change) than crop plants. Consequently, effective management of weed is a vital pre-requisite notable production of rice. For instance, if crop

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losses of approximately 10–20 % are recovered through effective weed management with the use of appropriate herbicides, there will be additional yield of 0.3–0.6 t/ha. Different weed management practices were studied in paddy in present study were bensulfuron methyl 60 g + 600 g a.i ha-1 as pre emergence followed by mechanical weeding at 30 DAS/T, bispyribac sodium @ 25 g a.i ha-1, farmer's practice and weedy check. among weed management practices, pre emergence application of bensulfuron methyl + pretilachlor mixture followed by mechanical weeding at 30 DAS/T resulted in higher B:C ratio compared to other methods of weed control. Finally, it could be concluded that there are good opportunities for Herbicide (Stilleto) to create a market space in the study area. The company need to focus on certain factors like farmer's expectations, field demonstrations and creating awareness in the study area.

Keywords: Promotional tools; pre- emergence herbicide; weed management; seed dormancy; biological threat; demonstration.

1. INTRODUCTION

Paddy (*Oryza sativa*) is the major staple food for a large population of world's population especially in South and East Asia, 65% of the India's population major staple food is Rice. Paddy is the main kharif crop and its sowing begins with the onset of the southwest monsoon from June and harvesting from October onwards. Out of total rice production in 2021-22, 111.76 million tonnes were in Kharif season and 18.53 million tonnes in Rabi (winter-sown) season. The country exported 21.2 million tonnes of rice in 2021-22 fiscal year, of which 3.94 million tonnes were basmati rice Major share of rice is cultivated during Kharif season [1-3]. "In general, cultural and mechanical methods of weed control are time consuming, and laborious apart from being less effective because of chance of escape and regeneration of weeds from roots or rhizome that are left behind [4-6]. The morphological similarity between the crop and certain grassy weeds makes hand weeding difficult. The use of herbicides therefore, appears to be the only alternative. In present context it is most preferable and farmer can easily go for it because day by day increases labour problems. Under puddle sown rice culture, chemical method of weed control is the efficient method for controlling grasses, sedges and broad-leaved weeds, and reducing the labour cost and achieving higher grain vield, as hand weeding has become nearly impossible due to labor scarcity and high wages" (Shekar et al., (2004).

Shekar et al., (2004) observed that "significant increase in the grain yield (4.45 t ha) by the application of pyrazosulfuron ethyl @ 20 g ha' at 10 DAT". Saha (2006) reported that "sufonvlurea group of herbicides is one of the most important classes of herbicide that has become popular all over the world". STILLETO is Pre-Emergence herbicide which has composition of Pendimethalin 38.4% + Pyrazosulfuron ethyl 0.85% ZC. and it is selective herbicide which has systemic mode of action. Majorly it is effective in transplanted rice. The Target Weeds are Echinochloa colona (Wild rice), Echinochloa crusgalli (Banyyard grass), Marsilea quadrifolia (Common water clover), Ludwigia parviflora (Water crest), Cyperus difformis (Common sedge), Cyperus iria (Umbrella sedge), Cyperus spp. This product is mainly useful in paddy crop. This is the only product which is also effective in water logging condition in case of pre-emergence herbicide [7-9]. Herbicide are primarily grouped into inorganic and organic herbicides. The selective and non-selective herbicides depending on their selectivity, the selective herbicide kill only the targeted plants or weeds while crop are not affected; e.g. simizine, atrazine, 2,4-d, butachlor, alachlor, fluchloralin and pendimethalin. Now selective herbicide kill all vegetation that they come in contact with irrespective of whether it is a crop or weed eg. paraquat and diquat.

2. METHODS

Selection of District: Haryana state has 22 districts. Out of these districts Jhajjar was selected purposively. The reason for the selection of district was on the basis of Paddy Cultivation and maximum use of herbicide in paddy crop.

Selection of block: Selection of the block is the second stage of sampling. Out of 5 blocks, Jhajjar block was selected purposively.

Table 1. Block selection for the study

Sr. No.	Name of Blocks	No. of Villages in Block
1.	Jhajjar	72
2.	Bahadurgarh	69
3.	Matannail	46
4.	Salhawas	40
5.	Beri	37

Table 2. Selection of respondents and their percentage

S. No.	Respondents	Land Holdings	Percentage (%)
1.	Marginal Farmers	0-1 Hectare	34
2.	Small Farmers	1-2 Hectare	21
3.	Semi Medium Farmers	2-4 Hectare	19
4.	Medium Farmers	4-10 Hectare	16
5.	Large Farmers	Above 10 Hectare	10
		Total	**100**

Selection of Villages:- There 10 villages were selected randomly out of 72 villages for the study.

Selection of Respondents:- A village wise list of all the respondents is selected by visiting them. Further, they are stratified on the basis of beneficiaries and non- beneficiaries, complete list of all 100 farmers were selected randomly.

Analytical tools:-

1. **Percentage formula:-**

   Percentage= (Value/Total Value) × 100

2. **Garrett's Ranking Technique:-** (Garrett and Woodsworth, 1969):

   Per cent position = [100 (Rij– 0.5)] / Nj

Where,

Rij= rank given for ith problem by jth individual
Nj= number of problems ranked by the jth individual

3. RESULTS

Since from the COVID each and every sector in India faced lot of challenges or problems related with their products. Due to lockdown its hard-to-reach companies' product towards the customer. But only agriculture sector which grows during the lockdown also. The GDP from agriculture sector also increased at the time of lockdown by 3.9% from the above given information we found that the most of the agricultural companies used various sales promotion strategy in agriculture named as Have an online presence, Advertising, Public speaking, Retailer Visiting, Value addition, Exhibition, Handout samples, Offer discounts, Network with people related with agriculture field. The Delphi Technique was originally conceived as a way to obtain the opinion of experts without necessarily bringing them together face to face. Expert's opinion was taken from the previous year data, company representative & distributers/dealers [10-13].

Thus, from these opinions it was concluded that the following promotional tools were identified as following:-

Table 3. Promotional tools identified for the study

S. NO.	Promotional tools	Number	Percentage	Ranking
1	Farmers meeting	40	40%	1
2	Posters	10	10%	5
3	Phone call	20	20%	3
4	Company people	12	12%	4
5	Demo	3	3%	6
6	Literature display	15	15%	2
	Total	100	100%	

4. DISCUSSION

Out of total sample size, 40 percent farmers responded that farmer meeting is the best source of information to them. The more fascinating fact is that 98.5 percent of farmers who considered Farmer meeting as the best source also believed that Company People (Individual Contact) helps them to update their knowledge regarding recent agronomic practices in Paddy. When asked specifically regarding the Demo, 100 percent of the respondent said that every company must practice it and Demo creates good will among Farmers. The respondents did not know much about Display items such as Cut-outs, Promo gates, Poster, cubes etc. as they had not observed such items at the shop of retailer. Wall paintings and trolley paintings are virtually in existent in Case of pesticide market.

During the study in JHAJJAR region different promotional activities were adopted, which are as follows:

1. **Farmers Meeting (Public speaking)**

   - The farmers meeting were conducted as an awareness program in villages to provide valuable information regarding STILLETO (Herbicide) about its effective use in the field of paddy.
   - During the farmers meeting, the problems were noticed from the farmer side and effective solutions were provided for the better production of paddy.

2. **Field Visiting:-**

   - Field visited were conducted and analyses the crop related issues and provided the effective solution to the farmers.
   - Proper guidance was provided to farmers, about the effective, safe and proper use of pesticide. Regularly field visit were conducted to get the proper feedback about STILLETO.

3. **Product Demonstration:-**

   - Product demonstration were conducted to attract the farmers in show the result of the product (STILLETO). Regular follow up of demonstration were conducted on the field site.
   - After the successful result field day were conducted by gathering a group of farmers of near-by villages to show the result of STILLETO.

4. **Retailer Visiting:-**

   - Retailer's visit were conducted to analyses the market demand of the product. It helps to increase market share of STILLETO.

5. **Poster (Banner):-**

   - We put the banners at the point of purchase and also on four wheelers to cover maximum area. This tool helped a lot to generate demand for STILLETO product in Jhajjar district.
   - Pamphlets were distributed to the farmers to let them help for recall about the product.

5. CONCLUSION

In agriculture, India has made lot of progress since independence, in the field of agriculture and its productions under many crops. In the green revolution by the adoption of modern agricultural techniques since last four decades has enabled the farmers to increase their production. But due to lockdown its hard-to-reach companies' product towards the customer. But only agriculture sector which grows during the lockdown also. A majority of Farmer (i.e, 70%) knew about the use of herbicide. Company also has good relation on major role at the time of buying agrochemical products. Also found that advertisements also play effective role in creating awareness of agrochemical products. it could be concluded that there are good opportunities for Herbicide (STILLETO) to create a market space in the study area. The company need to focus on certain factors like farmer's expectations, field demonstrations and creating awareness in the study area. Effective promotional Strategies were used for enhancing the market value of STILLETO. An awareness programs were conducted in villages to provide valuable information regarding STILLETO (Herbicide) about its effective use in the field of paddy. Product demonstration were conducted to attract the farmers in show the result of the product (STILLETO). As many activities were conducted to get the farmers faith and increase the market value of product but the Farmer meeting as the best source also believed that Company People

(Individual Contact) helps them to update their knowledge regarding recent agronomic practices in Rice. When asked specifically regarding the Demo, 100 percent of the respondent said that every company must practice it and Demo creates good will among Farmers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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