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Weed Management in Transplanted Rice through Different Weedicides at Rice Research Station Bahawalnagar

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ABSTRACT

A study was conducted at Rice Research Station Bahawalnagar during Kharif, 2015 and Kharif, 2016 for weed control in rice variety (PS-2) cultivated under transplanted method. To manage the weeds in transplanted rice five weedicides were tested. Out of five weedicides viz. Machete (Butachlor), Clover (Bispyrabic sodium), Winsta (Bispyrabic sodium+Bensulfuronmethyl), Machete+Clover (Butachlor+Bispyrabic sodium), Machete+Winsta (Butachlor+Bispyrabic sodium+Bensulfuronmethyl) applied, gave maximum paddy yield of 3.4 t/ha with least weeds intensity in 2015 and 3.5 t/ha with least weeds intensity in 2016. Weeds intensity reduction due to weedicides application ranged between 67.74 to 93.54 percent in 2015 and ranged 63.33 to 90 percent in 2016.

Keywords: Rice, Variety, Weeds, Paddy yield

INTRODUCTION

Rice, *Oryza sativa* L. is the second most important foreign exchange earning crop after cotton in Pakistan [1]. Various constraints for good rice production including, insect pests, diseases and weeds are very important. Rice is grown on area of 2748 thousand hectares with annual production of 6811 thousand tons giving an average yield of 2479 Kg/ha [2]. Weedicides are commonly used to manage rice weeds. The results of studies will provide information to the farming community for effective control of weeds of rice in Bahawalnagar region. It is reported to have been providing 27% of the dietary energy and 20% of dietary protein in the 3rd world countries [3]. A number of weed species including *Cyprus rotandus* L., *C. difformis* L., *Echinochloa colonum* (L.) and *Marsilea minuta* L. have been recorded from different rice growing areas in Pakistan [4]. Many other factors, low per hectare paddy yield may be attributed to serious weed infestation in the crop. Chemical weed control technology is cheaper, more convenient and efficient. However, losses caused by weeds vary with location, weed infestation duration and weed flora predominance [5]. The negative impacts of weeds on plant productivity can be accompanied by deleterious consequency on natural beneficial soil microbial flora [6].

The weed intensity reduction due to weedicide application ranged b/w 59.38-78.12% after weedicide application paddy yield also increased from 31.75-78.95% as compared to control [7].

MATERIALS AND METHODS

The studies were conducted at Rice Research Station Bahawalnagar during Kharif 2015 and 2016. The experiment was laid out in randomized complete block design having plot size of 7.5 × 15 square feet, with three replications. Five weedicides viz. Machete (Butachlor), Clover (Bispyrabic sodium), Winsta (Bispyrabic sodium+Bensulfuronmethyl), Machete+Clover (Butachlor+Bispyrabic sodium), Machete+Winsta (Butachlor+Bispyrabic sodium+Bensulfuronmethyl) were compared for weed controlling efficacy in paddy yield.

Nursery of rice variety PS-2 was sown in the 2nd week of June and transplanted at 30 days after planting. Data on weed density from each plot were recorded by marking m × m area from three locations of each plot. Paddy yield was also recorded at the time of crop maturity.

RESULTS AND DISCUSSION

The data revealed that during 2015 and 2016 weedicides gave good weed control and produced significantly higher paddy yield as compared with control. The major weeds observed in the experimental plots were *Cyprus rotandus, Cyprus difformis, Cyprus iria* and *Echinochloa colona*. The results of year 2015 mean data showed that plant height, number of productive tillers per hill, panicle length, number of grains per panicle, 1000 grain weight and paddy yield were significantly influenced by different weedicides treatments. Maximum plant height of 113 cm was recorded in treatment where Butachlor+Winsta were applied. However minimum plant height (103 cm) was recorded in control treatment. Rice plant produced more number of productive tillers per hill (23) as well as longest panicle (29 cm) where Butachlor+Winsta were applied. The lowest number of productive tillers per hill (16) and shortest panicles (27 cm) were recorded in control treatment receiving no weedicides application. Number of grains per panicle (142) were more at Butachlor+Winsta application shown in Graph 1. The lowest number of grains per panicle (117) was recorded in control treatment. 1000 grain weight was highest (20.48 g) in Butachlor+Winsta application. Lowest 1000 grain weight (20.20 g) was recorded in control treatment.The treatment where Butachlor+Winsta was applied produced a maximum paddy yield 3.4 t/ha Shown in Graph 2. The control treatment produced minimum paddy yield 2.36 t/ha. The results of year 2016 mean data showed that maximum plant height Maximum plant height of 114 cm was recorded in treatment where Butachlor+Winsta was applied. However minimum plant height (102 cm) was recorded in control treatment. Rice plant produced more number of productive tillers per hill (23) as well as longest panicle (30 cm) where Butachlor+Winsta was applied. The lowest number of productive tillers per hill (15) and shortest panicles (26 cm) were recorded in control treatment receiving no weedicides application. Number of grains per panicle (140) was more at Butachlor+Winsta application. The lowest number of grains per panicle (116) was recorded in control treatment. 1000 grain weight was highest (20.40 g) in Butachlor+Winsta application. Lowest 1000 grain weight (20 g) was recorded in control treatment. The treatment where Butachlor+Winsta was applied produced a maximum paddy yield 3.5 t/ha. The control treatment produced minimum paddy yield 2.3 t/ha. Reported that all chemical combination controlled the most dominant weeds and produced yield comparable to those of hand weeded control (pulling by hands or removal by sickle) [8]. Weed control by Pertilachlor 400 ml/acre and hand weeding produce higher yield [9]. Butachlor @ 800 mla/acre significantly reduced weed population. Maximum weed control was observed when butachlor was applied 1-3 days after transplanting [10].

Table 1 showed that maximum weed control and paddy yield obtained in treatment Machete+Winsta during 2015. The increase in paddy yield due to weedicide may be attributed to better reduction in weed infestation rate [11].

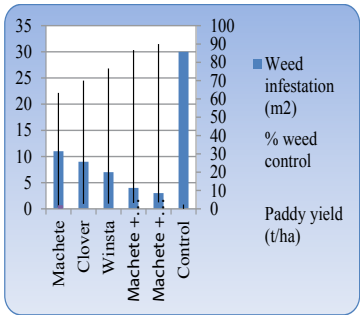
Table 2 showed that maximum weed control and paddy yield obtained in treatment Machete+Winsta during 2016.

Table 1: Effect of weedicides on weed density and paddy yield during 2015

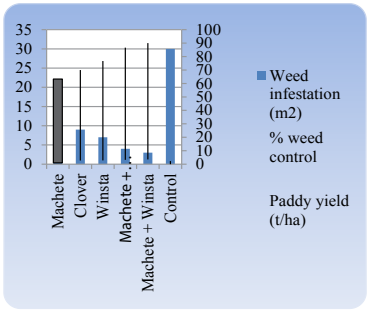
Treatments	Weed infestation (m^2)	% weed control	Paddy yield (t/ha)
Machete	10	67.74	2.9
Clover	8	74.19	2.68
Winsta	7	77.41	2.71
Machete+Clover	3	90.32	3.1
Machete+Winsta	2	93.54	3.4
Control	31	0	2.36

Table 2: Effect of Weedicides on Weed density and Paddy yield during 2016

	Weed infestation (m^2)	% weed control	Paddy yield (t/ha)
Machete	11	63.33	2.75
Clover	9	70.0	2.70
Winsta	7	76.66	2.8
Machete + Clover	4	86.66	3.2
Machete + Winsta	3	90.0	3.5
Control	30	0	2.3



Graph 1: Effect of weedicides on paddy yield and % weed control during 2015



Graph 2: Effect of weedicides on paddy yield and % weed control during 2016

CONCLUSION

It is concluded that during 2015 Machete+Winsta (Butachlor+Bispyrabic sodium+Bensulfuronmethyl) gave maximum paddy yield of 3.4t/ha and during 2016 3.5t/ha with least weeds intensity 93.54 percent in 2015 and 90 percent in 2016.

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