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COMPARATIVE STUDIES OF DIFFERENT WEEDICIDES AGAINST WEEDS OF RICE CROP

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ABSTRACT

The experiment was conducted at Plant Physiology Department, Rice Research Institute, Dokri, Larkana Pakistan to evaluate the efficacy of weedicides against Rice crop weeds. Different sedges Cyprus rotundus, C, difformus, C, iria, F. milliacea and Scripus species. Grasses Echinochloa colona, E. Crus galli, Leptochloa chinensis and Paspalum distichu, broad leave weeds Sphenoclea zeylanica, Ipomoea aquatic, Ammannia coccinea and Nymphaea nouchhali were recorded in rice crop field. Results shown that the all the weedicides performed better than control (Un-treated). Weed population density was reduced significantly Sedges, grasses and broad leave weeds were controlled better by T-03 Pyranex Gold 60WDG followed by Refit 50% EC, (84%, 85% and 76.25, and 80%, 77.50 and 71.25%) respectively. Lowest control against all weeds were recorded (42.50%) in T-07 Machete 60%EC 800ml/Acre, while maximum weed control (81.3%) was observed in T-03 Pyranex Gold 60WDG (100gms/Acre). Highest yield increase 2950kgs/A (131.11%) was recorded in T-03 Pyranex Gold 60WDG followed by T-06 Refit 50% EC, 2825kgs/A (125.55%) compared with Control 2250kgs/A. Due to weed infestation, late maturity was observed in T-08 Control (97 days) while all treated plots were mature in 80 to 87 days after transplanting. Highest plant height (104cm) was recorded in T-06 Refit 50% followed by T-01 Sun Star Gold 60WP. Highest tiller per plant were observed 24 in T-03 Pyranex Gold 60WDG, while control recorded minimum number of tillers 18/P. Maximum yield was recorded 2950kg/A in T-03 Pyranex Gold 60WDG followed by T-06 Refit 50%EC control yield was lowest 2250kgs/A among all treatments.

Keywords: Rice, Weeds, weedicides, Control.

1. INTRODUCTION

Rice plays a significant role in the economy of Pakistan. It contributes 20% in foreign exchange earnings and is grown on an area of 2.57 million hectares with an average yield of 2075 kg/hectares (Anonymous 2006-07). The paddy yield of the country is either stagnant or declining day by day. It may be due to various factors but suboptimum plant population is of significant importance in transplanted rice (Mann and Ashraf 2001) These include problems of insect pests, diseases and weeds. (Imeokparia, and Okusanya1997; Akobundui. 1981). Weeds are the most frequent and widespread biotic constraint to productivity throughout the rice environments (Balasubramanian et al., 2007) Timing of weed emergence and the pressure exerted to the crop

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through interference are highly correlated so that resultant yield losses are usually higher when weeds emerge earlier or simultaneously with crop (Aldrich, 1987) There are several reasons for low productivity and the one due to weeds is the most important. Weeds compete with rice for moisture, nutrients, light, temperature and space. Uncontrolled weeds have caused yield reduction of 28 to 45% in transplanted rice (Singh et al., 2007; Manhas et al., 2012). Butachlor, anilofos, oxadiargyl and pretilachlor are herbicides presently used for weed control in transplanted rice(Singh et al., 2004). Farmers are facing lot of weed troubles in their fields, Weeds emerging and its growth and development is faster than the crop, its impact clearly observed in yield of Rice Crop.

Weedicides are quick and fast acting source of weed control. Pre emergence and Post emergence Chemicals are often available in market for weed control. Evaluating their efficacy under field conditions for specific and better weed control was necessary. Keeping all above factors in mind current studies has been design to test the efficacy of Weedicides against Rice Crop weeds and its impact on Yield under filed conditions.

2. MATERIALS AND METHODS

The experiment was conducted at Plant Physiology Department, Rice Research Institute, Dokri, Larkana Pakistan in Kharif 18-19 for testing of different Weedicides and their impact on Rice Crop. The details of experiment are as under

Details			
Year	2018-19	No. of plants/row	30
Design	RCBD	Plot Size	32.4 Sq. meters
Replication	03	Nursery Sowing date	07.06.18
Treatments	08	Transplanting date	05.07.18
No. of rows/entry	27	Variety	IR-6

Heavy infestation plot was selected; application was weedicides were made according to their recommended timings. Weeds infestation was recorded on weekly basis, weeds were recorded in 3 categories as sedges, grasses and broad leave weeds. Control of weedicides was measured in percentage. The detail of Treatment as under

S#	Brand Name	Formulations	Active	Dose/Acre
01	Sun Star Gold	60WP	Ethoxysulfuron	20gms
02	Bispyripac Sodium	40WP	Bispyripac Sodium	100gms
03	Pyranex Gold	60%WG	Bensulfuron Methyl + Bispyribac sodium	100gms

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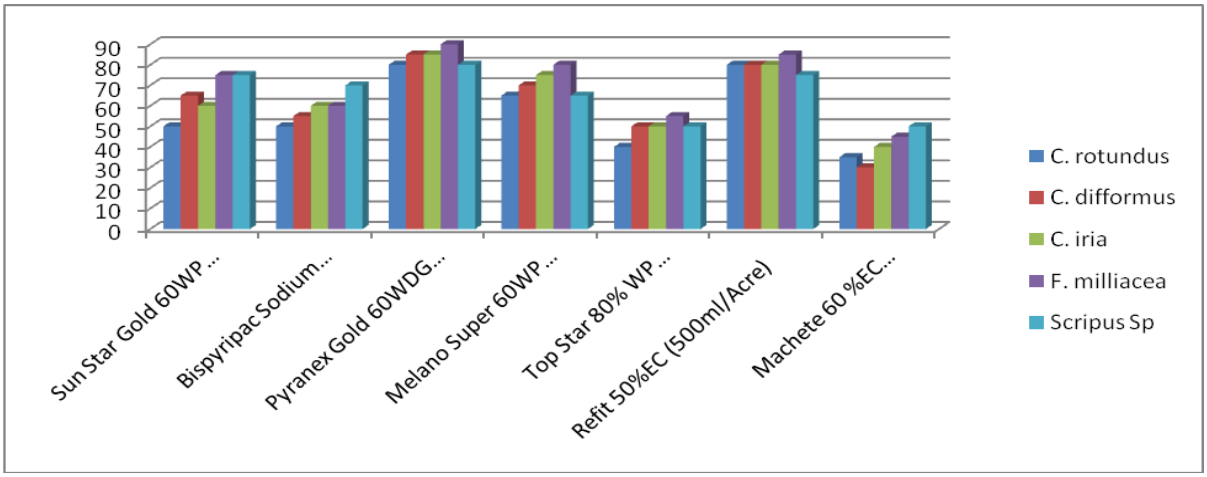
04	Melano Super	60%WP	Bensulfuron Methyl + Bispyribac Sodium	100gms
05	Top Star	80% WP	Oxadiargyl	40gms
06	Refit	50%EC	Pretilachlor	500ml
07	Machete	60 %EC	Butachlor	800ml
08	Control	-		-

Different agronomic studies 90% Maturity, Plant Height in cms, Tillers/plant and yield from in each treatment were also recorded to evaluate the impact of Weedicides on growth and development and yield of rice crop.

3. RESULTS AND DISCUSSION

The experiment was conducted to evaluate the efficacy of weedicides against Rice crop weeds, different sedges were recorded such as *Cyprus rotundus, C, difformus, C,iria, F. milliacea* and *Scripus species*. The results shown that the Hieghtest sedges control was observed in T-03 Pyranex Gold 60WDG *Cyprus rotundus, C, difformus, C,iria, F. milliacea* and *Scripus species* (80%, 85%,85%, 90% and 80%) respectively while T-07 Machete 60 %EC was observed weaker against Sedges in conducted Experiment. See Graph 01.

Graph #01 The Efficacy of different Weedicides against Sedges weeds in Percentage in Rice Crop.



Grasses are often found in rice crop field specially *Echinochloa colona* and *E. Crus galli.* Both weeds population recorded highest in fields. T-03 Pyranex Gold 60WDG shown reduction of *Echinochloa colona, E. Crus galli, Leptochloa chinensis* and *Paspalum distichum* (85%, 80%, 85% and 90%) respectively while T-05 Top Star 80% WP was found be weaker against *E. colona,* and T-07 Machete 60 %EC couldn't able to control *E. Crus galli* properly. See Graph #02.

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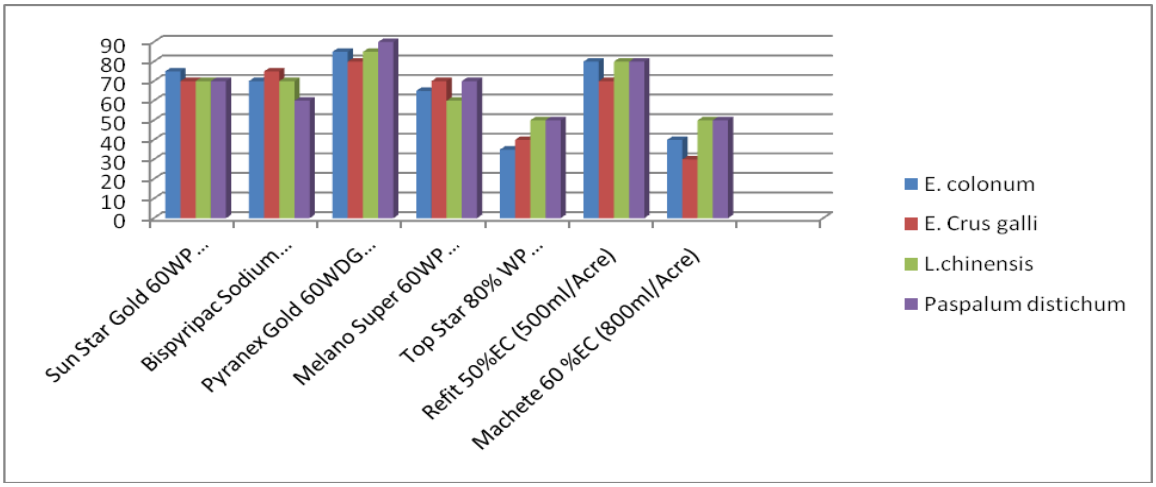
Graph #02 The Efficacy of different Weedicides against Grasses in Percentage in Rice Crop.



Different broad leave weeds were recorded such as *Sphenoclea zeylanica Ipomoea aquatica Ammannia coccinea* and *Nymphaea nouchhali* The results shown that the All the treatments reduced broad leave weeds T-03 Pyranex Gold shown over all better control against all weeds specially *Sphenoclea zeylanica* was better controlled up to 95%, followed by Refit 50%EC 90%. while T-02 Bispyripac Sodium40WP, T-05 Top Star 80% WP and T-07 Machete 60 %EC was observed weaker against *Ipomoea aquatica.* See graph #03

Graph #03 The Efficacy of different Weedicides against broad leaves weeds in Percentage in Rice Crop.

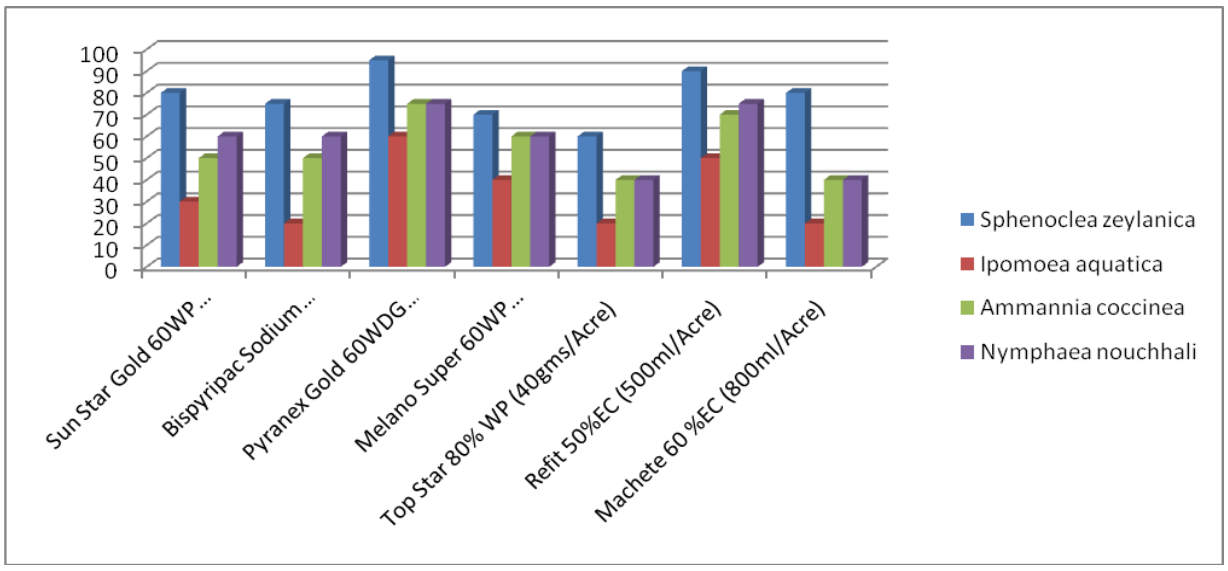


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Table # 01. Effect of different weedicides on weeds in Percentage.

S.#	Treatment	Sedges	Grasses	B.Leave weeds	Total Av
01	Sun Star Gold 60WP (20gms/Acre)	65	71.25	55	63.75
02	Bispyripac Sodium (100gms/Acre)	59	68.75	51.25	59.66
03	Pyranex Gold 60WDG (100gms/Acre)	84	85	76.25	81.75
04	Melano Super 60WP (100gms/Acre)	71	66.25	57.5	64.92
05	Top Star 80% WP (40gms/Acre)	49	43.75	40	44.25
06	Refit 50%EC (500ml/Acre)	80	77.5	71.25	76.25
07	Machete 60%EC (800ml/Acre)	40	42.5	45	42.50
08	Control	-	-	-	-

The impact of Weedicides was observed against rice crop growth and development. The results shown that due to weed infestation, late maturity was observed in T-08 Control While all treated plots were mature to 80 to 87 days after transplanting. Hightest plant height (104cm) was recorded in T-06 Refit 50%EC followed by T-01 Sun Star Gold 60WP. Height tiller per plant were observed in 24 in T-03 Pyranex Gold 60WDG, followed by T-6 Refit 50%EC while control recorded minimum number of tillers 18/P. Maximum yield was recorded 2950kg/A in T-03 Pyranex Gold 60WDG followed by T-06 Refit 50%EC, while control yield was recorded lowest 2250kgs/A among all treatments. See table #02

Table # 02. Effect of different Weedicides on different development stages and Yield of Rice Crop under field conditions.

S.#	Treatment	90% Maturity Days	Plant Height (Cm)	Tillers / Plant	Yield Kgs/Acre	Yield Increase %
01	Sun Star Gold 60WP (20gms/Acre)	85	103	21	2633	117.0
02	Bispyripac Sodium (100gms/Acre)	90	98	18	2542	112.9
03	Pyranex Gold 60WDG (100gms/Acre)	88	101	24	2950	131.11

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04	Melano Super 60WP (100gms/Acre)	87	100	20	2811	124.93
05	Top Star 80% WP (40gms/Acre)	80	101	20	2619	116.4
06	Refit 50%EC (500ml/Acre)	85	104	22	2825	125.55
07	Machete 60%EC (800ml/Acre)	80	102	21	2352	104.53
08	Control	97	96	18	2250	-

Overall results shown that the all the weedicides performed better than control (Un-treated) Weed population density was reduced significantly Sedges, grasses and broad leave weeds were controlled better by T-03 Pyranex Gold 60WDG followed by Refit 50% EC, (84%, 85% and 76.25, and 80%, 77.50 and 71.25%) respectively. Overall Lowest control against all weeds were recorded (42.50) in T-07 Machete 60%EC (800ml/Acre) while maximum control(81.3) was observed in T-03 Pyranex Gold 60WDG (100gms/Acre) followed by T-06 Refit 50%EC (500ml/Acre). Highest yield increase 2950kgs/A (131.11%) was recorded in T-03 Pyranex Gold (Bensulfuron Methyl + Bispyribac Sodium) 60WDG followed by T-06 Refit 50% EC (), 2825kgs/A (125.55%) compared with Control 2250kgs/A (See Table 03). Hussain et al (2008) tested four weedicides compared their efficacy with hand weeding. Among the weedicides Nominee 100SC (bispyribac sodium) and Sunstar Gold 60WG (Ethoxy sulfuron) proved as the best weedicides with 90.5 and 87.19% weed control respectively. The paddy yield in both the weedicide treatments was also comparatively higher than other weedicides. The highest net benefit was obtained by the application of nominee 100sc. Mahajan et al (2009) weed density and dry weight were negatively correlated with rice grain yield Post-emergence application of bispyribac Na 25 g/ha and penoxsulam 25 g/ha could effectively control all the weeds. Samar Singh et al (2006) pretilachlor with safener (500 g a.i. ha^{-1}) as pre-emergence applications followed by one hand-weeding were effective in controlling weeds, increasing grain yield. Prakash el al (2012) of Bispyribac Sodium SC@ 50 g a.i/ha at 15–20 DAT produced significantly higher grain yield (56.99q/ha which was at par with Bispyribac Sodium SC@ 35 g a.i/ha at 15–20 DAT. Number of weeds and dry weight of weeds also minimum in these treatments

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