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EFFECT OF SELECTED HERBICIDES ON WEEDS OF RICE CROP FIELDS OF JEHANABAD DISTRICT

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Key words : Selected herbicides, Weeds, Rice crop field, Jehanabad District

Weeds and relative weed density in the rice crop field have been worked out. Weed cover score at 50 DAT has also been investigated. Herbicides treatment and plant height, number of tillers /hill, panicle length and toxicity symptoms were also estimated.

INTRODUCTION

Weeds are unwanted plants associated with the crop and share the common nutrient pool and interaction between the weed and the crop is negative interaction type. They have general purpose genotype. The yield loss can be as high as 60-75% in planted rice due to weed infestation (Imeokpara, 1994, Suresh Kumar, 2016). The use of hand weeding in the control of weeds by most small holder farmers in developing countries is known to be time consuming and labour intensive. Hence the situation favors the herbicides for fast and more effective weed control measure. In the present investigation, the effectiveness of four herbicides were determined in local agroclimatic conditions of Jehanabad.

MATERIALS AND METHODS

The material for present investigation is *Oryza sativa* of family Poaceae. Jehanabad is the best suited for rice cultivation due to high humidity, prologned sunshine and assured supply of water. Temperature varied between 20°C-35°C. At the time of tillering, the crop requires a high temperature. Temperature during blooming period was in the range of 26.5°C-29.5°C. At the time of ripening, the temperature was between 20-25°C.

Relative weed density was calculated by following formula :

$$\text{Relative Density} = \frac{\text{Density of individual weed species}}{\text{Total Density of all weedy species}}$$

The data regarding weeds were recorded at 25 and 50 days after transplantation. Dry weight of weeds were taken by drying them in an electric oven at 60°C for 72 hour followed by weighing by digital balance. Herbicide residue in crop field soil was determined through Bioassay technique by using Spectrochromatography. The hebicides selected were Butachlor, and Cinosulfuron in isolation and with ortho-suphamuron in combination.

Herbicidal dosages were applied as follows :

1. Butachlor - @ 15kg/hectare
2. Cinosulfuron - @ 50gm/hectare
3. Butachlor and Orthosulfamuron (15kg/hectare + 120gm/hectare)
4. Cinosulfuron + Orthosulfamuron (50gm/hectare + 120gm/hectare)

Untreated weedy crop field was taken as control.

Results and Discussion :

The prevalent weeds and their relative weed denstiy in the rice crop field have been given in Table-1.

Weed cover score at 50 DAT has been shown in Table-2. It is obvious that post emergence pesticidal treatment by Orthosulfamuron significantly redued overall weed cover scroe in experimental rice cover fields.

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The average herbicide persistence in soil in days in decreasing order was Cinosulphuron (17), Butachlor (10) and Orthosulfamuron (07). In the conducted study, it was evident that the dissipation of Orthosulphamuron was rapid. Plant height at maturity in control and experimental plot did not vary significantly. Highest total number of tillers/hill was observed in Butachlor + Orthosulfamuron treated plants as against controlled plants which produce lowest number of tillers per hill at 6.73.

Panicle length in centimeter, number of grains per panicle, thousand grain weight in gram and grain yield of rice were also assessed in the controlled and experimental plots. Toxicity symptoms and toxicity level of rice crops was assessed and have been given in Table-3.

The degree of weed competition is determined by the weedy species infestation and their density. Increase in weed population resulted in crop yield reduction. In most crops weed infestation in first 3-8 weeks is very critical. The introduction of Bordeaux mixture in 1896 stimulated interest in chemical method of weed control. This led to the discovery of copper salts for selective control of broad leaf weeds in cereals. The discovery of 2-4-D in the early 1940's has revolutionised the chemical method of weed control. Investigation on 2-4-D established that herbicides could be effective in minute quantities. They may be highly selective and systemic in action. Rice being a closely sown crop, that is why, mechanical weeding is most difficult. There is also chance of crop damage. Successful weed control is essential for economic rice production (Ishaya et.al. 2007)

Many of the herbicides are applied at a comparatively advanced stage of growth in transplanted rice (35-40 days after sowing). Timing of application is an important determinant of herbicides efficay and selectivity. Herbicide usages can lead to injury, stunting in growth and mortality of the crop itself (Oosterhus et.al. 1990). Therefore efficacy of such rice herbicides needs to be re-evaluated under local soil conditions and modifications in application. Time-frame is to be made to select appropriate herbicide for efficient weed management in rice.

REFERENCES

Imeokpara, P.O., (1994), Weed control in flooded rice with various herbicide combinations in the Southern Guinea Savanna Zone of Nigeria, International Journal of Pest Management, 40 (1) : 32-39.

Ishaya, D.B., Shebayan Jay and Tunku, P. (2007), The effect of weed control treatments on the growth and yield of three upland rice (*Oryza sativa* L) varieties at Samaru, Nigeria, Savana Journal of Agriculture, Vol. 2, No.1, June 2007. Faculty of Agriculture, Bayero University.

Oosterhus, D.M. ; Wullschleger, SD, Hampton, R.E. and Ball R.A. (1990). Physiological response of rice (*Oryza sativa*) to fenoxapro. Weed Sci. **38**; 459-462.

Suresh Kumar , R, Reddy Y. Ashoka and Ravichandran, S. (2016). Effect of weeds and their management in transplanted rice-A review. International Journal of Research in Applied Natural and Social Sciences (Impact : IJRNASS) ISSN (P) : 23447-4580; ISSN(E) : 2321-8851, 4(II) : 165-180.

Table-1

Prevalent weeds and their relative weed density (RWD) in rice crop field.

S.No.	Weed species	RWD
1.	*Ageratum conyzoides*	1.00
2.	*Amaranthus viridis*	1.0
3.	*Aeschnomene indica*	2.85
4.	*Corehorus trilocularis*	1.00
5.	*Cyperus rotundus*	1.00
6.	*Cyperus haspan*	1.50
7.	*Cyperus difformis*	3.98
8.	*Cyperus esculentus*	1.0
9.	*Cynodon dactylon*	5.10
10.	*Digera arvensis*	2.00
11.	*Digitaria sarguinalis*	3.50
12.	*Eclipta alba*	1.00
13.	*Echinochloa stagina*	4.32
14.	*Echinochloa colunum*	4.00
15.	*Echinochloa crusgalle*	1.70
16.	*Eichhornia natans*	1.50
17.	*Eleusine indica*	4.25
18.	*Eragrostis spp*	5.25
19.	*Fimbristylis littoralis*	2.94
20.	*Gnaphalium indicum*	4.00
21.	*Hymenache pseudointarupta*	1.00
22.	*Ipomoea aquatica*	5.55
23.	*Ipomoea repens*	5.35
24.	*Imperata cylindrica*	1.00
25.	*Klinga pumila*	1.50
26.	*Leersia hexandra*	6.50
27.	*Ludwigia hyssopifolia*	1.00
28.	*Monochoria vaginalis*	1.00
29.	*Nymphaea nouchali*	1.00
30.	*Oxalis europa*	1.33
31.	*Panicum repens*	5.28
32.	Rottboellia protensa	1.00
33.	*Scirpus marcittimus*	1.00
34.	*Setaria glauca*	3.30
35.	*Solanum nigrum*	1.10
36.	*Trianthema monogyna*	5.28

Table-2

Weed Cover Score (50 DAT)

S.No.	Treatments	Weed Cover Score
1.	Control	6.0
2.	Butachlor	4.0
3.	Cinosulfuron	4.00
4.	Butachlor + Orthosulfamuron	2.00
5.	Cinosulfuron + Orthosulfamuron	2.00

Table-3

Toxicity symptoms and toxicity level of Rice crop

S.No.	Treatments	Toxicity level	Toxicity symptoms
1.	Control	0	No toxicity
2.	Butachlor	0	No yellowing of leaves
3.	Cinosulfuron	1	Very slight yellowing of leaves
4.	Butachlor + Orthosulfamuron	3	Slight yellowing of leaves
5.	Cinosulfuron + Orthosulfamuron	3	Slight yellowing of leaves