

## Effect of time of sowing and weed control methods in direct seeded rice

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**ABSTRACT :** A field experiment was conducted to find the effect of time of sowing and weed control practices on yield and dry weight of weeds during *Kharif* season of 2010 and 2011 at AICRP on Weed Management, MKV, Parbhani. Sowing of paddy before onset of monsoon produced higher grain yields as compared to sowing after onset of monsoon. Whereas among the different weed control methods PE application of butachlor followed by one hand weeding recorded grain yields at par with weed free treatment.

**Key Words :** Direct seeding, Weed control, Paddy yield

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Rice is one of the major staples grown in India. Transplanting seedlings in puddled and flooded field is the traditional method of rice growing. High losses of water through puddling, surface evaporation and percolation are some of the disadvantages of this method.

Growing rice under aerobic environment can reduce water losses to greater extent. The water resources both surface and underground are shrinking and water is becoming a limiting factor. Hence, direct seeding instead of conventional transplanting to reduce water losses is being practiced. The productivity of direct seeded rice is often reported to be lower, the main reason behind this is associated with increased weed infestation. Aerobic soil condition and dry tillage practices besides alternate wetting and drying conditions are conducive for germination and growth of highly competitive weeds. According to Mamun *et al.* (1993), weed growth reduced the grain yield by 68-100 per cent for direct seeded *aus* rice, 22-36 per cent for modern *boro* rice and 16-48 per cent for transplanted *aman* rice. Herbicidal weed control methods offer an advantage to save labour and money, as a result, regarded as cost effective (Ahmed *et al.*, 2000). The time of sowing have noticeable impact on weed intensity and probably yield also. Delay in sowing results in slow growth of crop and increased infestation of competing weeds.

In light of above the experiment was conducted to test the effect of time of sowing and weed control methods on weed intensity and yield of direct seeded rice.

### RESEARCH PROCEDURE

A field experiment was conducted at All India Coordinated Research Project on Weed Management, Parbhani during *Kharif* season of 2010 and 2011 in split plot design with three replications. The main plot treatments were two different times of sowing *i.e.* before onset of monsoon and after onset of monsoon, while sub plot treatments were six different weed control methods *viz.*, pretilachlor-S 0.5 kg/ha Pre-em, butachlor 1.5 kg/ha Pre-em + 1 hand weeding, post emergence almix 4 g/ha, sesbania (broadcast) + 2,4-D 0.5 kg/ha at 30 DAS, weedy and weed free. The gross and net plot size were 4.5 x 4.5m and 3.6 x 3.6 m, respectively. The sowing (direct seeding) before onset of monsoon was done on 15/6/2010 and 6/7/2011 during first and second year of experiment, respectively. While sowing after onset of monsoon was done on 1/7/2010 and 18/7/2011 during first and second year of experiment respectively. The recommended dose of NPK and plant protection schedule was followed.

### RESEARCH ANALYSIS AND REASONING

The experimental findings obtained from the present study have been discussed in following heads:

#### Crop weed association :

Among broad leaved weeds *Ipomea maxima*, *Digera arvensis*, *Parthenium hysterophorus*, *Euphorbia geniculata*,

*Convolvulus arvensis* and *Acalypha indica* were found to be dominant species. The dominant grassy weeds were *Brachiaria eruciformis*, *Dinebra retriflexa*, *Cynodon dactylon*, *Amisophacelus cuculata* and *Heteropogon contortus*.

#### Dry weed weight :

Significant effect of different treatments on dry weed

weight of grassy as well as broad leaved weeds was observed (Table 2).

#### Effect of main treatments i.e. time of sowing :

Significantly lower dry matter of grassy weeds at 30 and 60 DAS was recorded in paddy crop sown before onset of monsoon than dry weed weight in the paddy crop sown after

Table 1 : Grain yield of direct seeded rice as influenced by different treatments			
Treatments	Grain yield kg/ha		
<b>Main treatments (Time of sowing )</b>	2010	2011	Mean
D <sub>1</sub> . Before onset of monsoon	2256	2381	2318
D <sub>2</sub> . After onset of monsoon	2122	2125	2124
S.E.±	150.25	57.31	
C.D. (P=0.05)	NS	168.80	
<b>Sub treatments (Weed control)</b>			
M <sub>1</sub> . Pretilachlor-s @ 0.5 kg/ha - PE	1738	1656	1697
M <sub>2</sub> . Butachlor @ 1.5 kg/ha – PE + 1 HW	2681	2594	2638
M <sub>3</sub> . Fenoxaprop @ 60 k g/ha – POE	1966	2401	2184
M <sub>4</sub> . Sesbna (broad cast ) + 2,4- D@ 0.5 kg/ha at 30 DAS	2293	2303	2298
M <sub>5</sub> . Weedy check	1556	1735	1646
M <sub>6</sub> . Weed free	2900	2834	2867
S.E.±	102.69	82.04	
C.D. (P=0.05)	302.46	242.67	
<b>Interaction</b>			
S.E.±	145.22	311.03	
C.D. (P=0.05)	NS	NS	

NS=Non-significant

Table 2 : Dry weed weight at 30 DAS and 60 DAS as influenced by different treatments								
Treatments	Grassy				Broadleaved			
	2010		2011		2010		2011	
	30 DAS	60 DAS	30 DAS	60 DAS	30 DAS	60 DAS	30 DAS	60 DAS
<b>Main treatments (Time of sowing )</b>								
D <sub>1</sub> . Before onset of monsoon	4.95	7.87	5.40	8.10	11.67	15.06	12.20	16.05
D <sub>2</sub> . After onset of monsoon	6.92	10.66	6.80	9.80	13.61	19.39	14.30	18.40
S.E.±	0.65	0.60	0.60	0.40	0.64	1.53	0.50	1.40
C.D. (P=0.05)	1.92	1.77	1.81	1.30	1.89	4.50	1.61	4.30
<b>Sub treatments (Weed control)</b>								
M <sub>1</sub> . Pretilachlor-s @ 0.5 kg/ha - PE	6.80	10.00	5.90	9.80	16.11	20.3	15.14	21.14
M <sub>2</sub> . Butachlor @ 1.5 kg/ha – PE + 1 HW	5.13	8.43	3.87	6.34	7.52	11.7	8.25	12.22
M <sub>3</sub> . Fenoxaprop @ 60 k g/ha – POE	6.09	9.37	7.90	8.73	12.05	17.1	12.10	18.10
M <sub>4</sub> . Sesbna (broad cast ) + 2,4- D@ 0.5 kg/ha at 30 DAS	5.87	8.81	6.20	7.18	11.03	15.3	9.30	16.24
M <sub>5</sub> . Weedy check	8.04	12.44	8.40	13.3	23.55	28.5	21.14	25.27
M <sub>6</sub> . Weed free	3.53	6.62	3.40	5.26	6.59	10.3	8.14	8.14
S.E.±	0.52	0.61	0.45	0.52	1.14	1.24	1.24	1.24
C.D. (P=0.05)	1.65	1.81	1.35	1.62	3.38	3.65	3.60	4.10
<b>Interaction</b>								
S.E.±	0.76	0.87	0.81	0.92	1.62	1.75	1.58	1.72
C.D. (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS

NS=Non-significant

onset of monsoon during both the years of experimentation.

The similar trend was observed in dry weed weight of broad leaved weeds wherein the significantly lower dry weed weight of broad leaved weeds at 30 and 60 DAS was observed in paddy crop sown before onset of monsoon than the dry weed weight of weeds in paddy crop sown after onset of monsoon during both the years of experimentation.

#### **Weed control efficiency :**

The maximum weed control efficiency was observed in paddy crop sown before onset of monsoon as regards grassy and broad leaved weeds than paddy crop sown after onset of monsoon at both the stages of observations *i.e.* at 30 and at 60 DAS during 2010 as well as 2011.

#### **Grain yield :**

Sowing of paddy crop after onset of monsoon reduced the paddy grain yield to the tune of 12 per cent and 15 per cent as compared with paddy crop sown before onset of monsoon during first and second year of the experiment, respectively. The grain yield of paddy crop sown before onset of monsoon was significantly more than grain yield of paddy crop sown after onset of monsoon during both the years of the experiment (Table 1).

#### **Effect of weed control treatments :**

##### *Dry weed weight :*

At 30 DAS and 60 DAS significantly lowest dry weed weight of broad leaved weeds was recorded in weed free situation which was found at par with the pre-emergence application of butachlor @ 1.5 kg /ha followed by one hand weeding during 2010 and 2011 also. Similar trend was observed in case of dry weed weight of grassy weeds. The interaction effect was found to be non significant for grassy and broad

leaved weeds for their dry weed weight at 30 and 60 DAS. Bari (2010) reported lower weed count with butachlor.

##### *Weed control efficiency :*

The maximum weed control efficiency of grassy weeds was observed in weed free situation followed by PE-butachlor @ 1.5 kg/ha + 1 HW at 30 and 60 DAS, respectively.

Whereas, in case of broad leaved weeds also maximum weed control efficiency was observed in weed free situation followed by PE-butachlor @ 1.5 kg/ha + 1 HW at both the stages of observations *i.e.* at 30 and 60 DAS, respectively.

#### **Grain yield :**

The grain yield of paddy crop was found to be influenced significantly due to various weed control treatments. During 2010 the highest grain yield of paddy (2900 kg/ha) was recorded with weed free situation, which was found at par with PE-butachlor @ 1.5 kg/ha followed by one hand weeding (Table 1). During 2011 the highest grain yield of paddy was recorded with weed free situation (2834 kg/ha) which was found at par with grain yield of paddy with PE- butachlor @ 1.5 kg/ha (2594 kg/ha) followed by one hand weeding and found significantly superior over rest of all the treatments. Bari (2010) also reported that highest rice yield was obtained with butachlor as compared to other weed control practices. The interaction effect of time of sowing and weed control methods was found to be non-significant.

#### **Conclusion :**

The paddy crop sown before onset of monsoon recorded significantly more grain yield than paddy crop sown after onset of monsoon. While the paddy crop grown in weed free situation resulted in highest grain yield which was found at par with PE-butachlor @ 1.5 kg/ha followed by one hand weeding.

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