

## Evaluation of clomazone for controlling weeds in wet direct-sown rice

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### ABSTRACT

*The efficacy of clomazone alone and tank mix formulation of clomazone and propanil at different concentration against weeds in direct wet seeded rice under puddled condition was studied. The predominant weed species observed in experimental plots were Echinochloa crusgalli, Echinochloa colona, Panicum repens, Cyperus iria, Cyperus difformis, Ischaemum rugosum, Spillanthus calva, Morselia quadrifolia and Molluga sp. The results indicated that tank mix application of clomazone 20 EC and propanil 40 EC at 750 ml ha<sup>-1</sup> applied at 15 or 20 days after sowing controlled weeds gave effectively and on par yield with weed free treatment (manual weeding) and recommended herbicide (Pretilachlor + Safener) besides, being phytotoxic to crop.*

*Key words: Direct wet seeded rice, weeds, clomazone, formulation*

Direct sown rice faces higher weed problem and consequent yield reduction as compared to transplanted rice. The extent of yield reduction in direct sown puddle rice is estimated to be around 30 - 45% (Pandey and Shukla, 1990). The traditional method of hand weeding is effective but non availability of labourers and increasing in labour wages the rice production under hand weeding, many a times become non profitable. It is therefore, essential to evaluate the alternative practices. Use of herbicides for control of weeds have been found promising elsewhere (Singh, 1993; Kalia and Bindra, 1996). Keeping in view, the present study was therefore undertaken to evaluate the performance of clomazone alone and tank mix formulations of clomazone and propanil in different concentration to control weeds in direct wet seeded rice.

A field trial was conducted at Zonal Agricultural Research Station, VC Farm, Mandya (Karnataka) during weteason of 2002-03, in a randomized block design and replicated thrice under puddled irrigated situation. The soil is red sandy loam with pH 7.3, having available Nitrogen of 209 kg ha<sup>-1</sup>, phosphorous of 53 kg ha<sup>-1</sup> and potassium of 145 kg ha<sup>-1</sup>. The trial consisted of fifteen treatments of different concentration of clomazone and tank mixtures of clomazone + propanil (Table 1) in comparison with weed free treatment (Hand weeding twice at 20 and 40 days after sowing) and recommended herbicide of

pretilachlor + safener 50 EC at 0.4 kg ha<sup>-1</sup> applied at 3 days after sowing and unweeded check. Herbicides were applied from 3 days after sowing to 20 days after sowing as per treatment using water as carrier material 500 lt. ha<sup>-1</sup> in a Knapsack sprayer fitted with flat fan nozzle.

Sprouted seeds of rice Cv. Mangala was manually broadcasted under puddled situation at the rate of 62.5 kg ha<sup>-1</sup>. Cultural operations and plant protection measures were followed as per recommended package. Observation on total weed density (No. m<sup>-2</sup>) was recorded at 15 and 30 days after sowing. Data on grain yield recorded.

The predominant weed flora observed in the experimental plots comprised of *Echinochloa crous galli*, *Echinochloa colona*, *Panicum repens*, *Cyperus iria*, *Cyperus difformis*, *Morselia quadrifolia*, *Spillanthus calva*, *Ischaemum rogosum* and *Molluga sp.*

Total weed density differed significantly due to herbicide application. At 15 days after sowing application of recommended herbicide pretilachlor + safener (Sofit) at 0.4 kg ha<sup>-1</sup> recorded significantly low total weed density (3.0 No. m<sup>-1</sup>) which was on par with application of clomazone alone 375 and 500 ml ha<sup>-1</sup> at 3 days after sowing (4.0 No. m<sup>-1</sup>) whereas, unweeded check recorded higher weed density (13 No m<sup>-2</sup>).

**Table. 1 Effect of herbicidal treatments on weed density and grain yield of direct seeded puddled rice**

Treatments	Dose (g ha <sup>-1</sup> )	Time of application (DAS)	Total weed density (No. m <sup>-2</sup> )		Grain yield (t ha <sup>-1</sup> )
			15 DAS	30 DAS	
Unweeded check	-	-	3.61 ** (13.0)*	4.63 **(2.1 0)*	1.82
Weeding twice		20 & 40	3.53 (12.0)	1.16(1.0)	4.57
Pretilachlor+Safener	400	3	1.86 (3.00)	1.95 (3.0)	4.43
Clomazone alone	375	3	2.03 (4.0)	2.66 (7.0)	2.78
Clomazone alone	375	6	2.60 (6.00)	3.13 (9.0)	2.69
Clomazone alone	500	3	2.18 (4.0)	2.40 (5.0)	3.83
Clomazone alone	500	6	2.53 (6.0)	2.66 (7.0)	2.76
Clomazone + Propanil	750	5	3.07 (9.0)	2.47 (6.0)	1.83
Clomazone + Propanil	1000	5	2.53 (6.0)	2.34 (5.0)	3.17
Clomazone + Propanil	750	10	2.96 (8.0)	2.96 (8.0)	1.94
Clomazone + Propanil	1000	10	2.60 (6.0)	3.12 (9.0)	2.53
Clomazone + Propanil	750	15	3.15 (10.0)	2.44(5.0)	4.15
Clomazone + Propanil	1000	15	3.18 (10.0)	2.40 (5.0)	3.12
Clomazone + Propanil	750	20	3.53 (12.0)	2.41 (5.0)	4.19
Clomazone + Propanil	1000	20	3.57 (2.0)	2.47 (6.0)	3.85
CD (P=0.05)			0.33	0.32	0.41

\*Figures in parenthesis refers to original values

\*\*Original data on weed density subjected to square root transformation  $Ax + 0.5$  before statistical analysis

DAS - Days after sowing

At 30 days after sowing among herbicidal treatments pretilachlor + safener (sofit), 50 EC at 0.4 kg ha<sup>-1</sup> applied at 3 days after sowing significantly recorded lower total weed density (3.0 No. m<sup>-2</sup>) followed by tank mix application of clomazone + propanil at the rate of 1000 ml ha<sup>-1</sup> at 5 days after sowing (5 No. m<sup>-2</sup> and clomazone alone 500 ml ha<sup>-1</sup> at 3 days after sowing (5 No. m<sup>-2</sup>). Whereas, unweeded check recorded higher weed density (21 No. m<sup>-2</sup>).

Among herbicidal treatments application of recommended herbicide pretilachlor + safener 0.4 kg ha<sup>-1</sup> applied at 3 days after sowing recorded maximum grain yield (4.43 t ha<sup>-1</sup>) which was on par with tank mix application of clomazone + propanil 750 ml ha<sup>-1</sup> at 20 days after sowing with grain yield of 4.19 t ha<sup>-1</sup>. However unweeded check recorded significantly lower grain yield (1.82 t ha<sup>-1</sup>).

Based on experimental results it is concluded that tank mix formulation of clomazone (20 EC) + propanil (40 EC) at the rate of 750 ml ha<sup>-1</sup> applied at 15 or 20 days after sowing found effective in controlling weeds in direct wet seeded rice under puddled irrigated condition.

## REFERENCES

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