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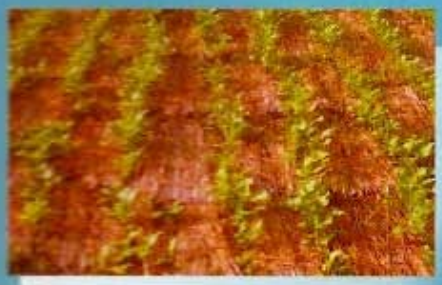
EXTENDED SUMMARY





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Weed management in jute through pre and post emergence herbicides

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Introduction

Jute (*Corchorus olitorius* L.), an important fibre yielding cash crop, is mainly grown in the states of West Bengal, Assam, Orissa and Bihar. Intermittent rain associated with hot and humid climate during the jute growing season in alluvial plains encourage profuse weed growth (Saraswat, 1999) and about 75-80% yield loss may occur (Sahoo and Saraswat, 1988). In general grasses are the dominant weeds in jute. Management of grass and broadleaved weeds in jute by use of pre-emergence herbicides such as Trifluralin is possible (Sarkar *et al.*, 2005). However, Trifluralin is not effective against the sedge weeds which may pose serious problem in some specific situation of jute area. There are a number of post-emergence herbicides like Cyhalofop butyl, Quizalofop ethyl and Fenoxaprop-p-ethyl which showed best weed control in broadleaved field crops like sunflower, soybean and potato (Ito *et al.*, 1998; Bedmar, 1997). Among the available post-emergence herbicides, only Quizalofop ethyl (5% EC) was tried and found effective to control grass weeds in jute (Ghorai *et al.*, 2004). Therefore, a field experiment was designed to study the effectiveness of the available pre-

emergence herbicide having effect on sedges (S-Metolachlor) and post-emergence grass herbicides in jute (cv. JRO 524).

Materials and methods

The experiment was conducted during 2006 in medium fertile neutral soil (pH 6.9) at the main farm (22.75°N, 88.43°E and 3.14 m altitude) of Central Research Institute for Jute and Allied Fibres (ICAR), Barrackpore, West Bengal with nine treatments and three replications, laid out in randomised block design with a plot size of 4 m x 3 m. The nine treatments were unweeded control, two hand weedings (HW) at 3 and 5 weeks after sowing (WAS), Trifluralin @ 0.75 kg a.i. ha^{-1} one day before sowing (DBS), S-Metolachlor @ 0.50 kg a.i.ha^{-1} (1 DBS), S-Metolachlor @ 0.50 kg a.i. ha^{-1} as pre-emergence (just after sowing of jute seed), Trifluralin @ 0.50 kg a.i. ha^{-1} + S-Metolachlor @ 0.50 kg a.i. ha^{-1} (1 DBS), Cyhalofop butyl @ 75 g a.i. ha^{-1}, Fenoxaprop-p-ethyl @ 75 g a.i. ha^{-1} and Quizalofop ethyl @ 75 g a.i. ha^{-1}. All the post emergence herbicides were applied at 21 days after sowing (DAS) when the grass weeds were at three-four leaf stage. Jute seed (JRO 524) was sown in line with a row spacing of 25 cm in the 2nd week of April and harvested at 110 days crop age. Biometrical observations on jute plant height, fibre yield, type of weeds, and dry weight of weeds were recorded.

Results and discussion

Effect on weeds

The highest weed dry weight was recorded in the unweeded control treatment (46.3 g m^{-2}) (Table 1) and in contrast the lowest weed biomass was observed in hand weeded plot (8.8 g m^{-2}) which corroborates the observations of Ghorai *et al.*, (2004) and Sarkar *et al.*, (2005). Among the herbicides tested, the lowest weed dry weight (9.7 g m^{-2}) was resulted with S-Metolachlor @ 0.50 g a.i ha^{-1}.

The highest weed control efficiency (WCE) of 80.9% was recorded in two hand weeding treatment. Among the herbicides, S-Metolachlor @ 0.50 kg a.i. ha^{-1} showed good WCE (79%). However, Fenoxaprop-p-ethyl at 75 g ha^{-1} and Quizalofop ethyl @ 75 g a.i. ha^{-1} as post emergence spray showed only 40% WCE, which was due to the dominance of sedge weeds which are not controlled by graminicides. It was earlier reported (Sarkar, 2006) that if the weed complex in jute is dominated by the grasses, higher WCE of 79-87% may be obtained with the application of graminicides like Quizalofop ethyl and Fenoxaprop-p-ethyl.

Effect on crop

The highest plant height of jute at harvest was recorded in S-Metolachlor treatment (252 cm) which was statistically at par with the plant height obtained with

Table 1. Effect of pre and post-emergence herbicides on weed control, growth and yield of jute

Weed control methods	Dose (kg a.i. ha^{-1})	Dry weight of weeds at 45 DAS (g m^{-2})	WCE (%)	PH (cm)	Fibre yield (kg ha^{-1})
Control	-	46.27	-	199	1261
Hand weeding (21 and 35 DAS)	Twice	8.83	80.92	242	2418
Trifluralin (PPI at 1 DBS)	0.75	27.2	41.21	233	1793
S-Metolachlor (PPI at 1 DBS)	0.50	31.43	32.07	232	1878
S-Metolachlor (PE)	0.50	9.70	79.04	252	2492
Trifluralin + S-Metolachlor (PPI)	0.50 + 0.50	29.00	37.32	239	2252
Cyhalofop butyl (POE at 21 DAS)	0.075	39.47	14.70	235	2111
Fenoxaprop-p-ethyl (POE at 21 DAS)	0.075	27.73	40.07	249	2329
Quizalofop ethyl (POE at 21 DAS)	0.075	27.60	40.35	244	2334
CD (0.05)		5.82		18.31	350

DBS: Days before sowing; PPI: pre plant soil incorporation; PE: Pre-emergence just after sowing of jute

Fenoxaprop-p-ethyl @ 75 g ha^{-1} (249 cm). Unweeded control treatment produced the shortest (199 cm) jute plants (Table 1).

Effect on fibre yield

Among the treatments, S-Metolachlor @ 0.50 kg a.i. ha^{-1} produced the highest fibre yield of 2492 kg ha^{-1} follwed by the fibre yield obtained from two hand weeding treatment (2418 kg ha^{-1}), quizalofop ethyl (2334 kg ha^{-1}) and Fenoxaprop ethyl (2329 kg ha^{-1}). Whereas, the lowest fibre yield was recorded with unweeded control treatment (1261 kg ha^{-1}).

Conclusion

Pre-emergence application of S-Metolachlor @ 0.50 kg a.i. ha^{-1} or two hand weeding at 21 and 35 days after sowing could effectively control the weeds in jute if the weed complex is dominated by sedges and resulted in higher fibre yield.

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