

Effect of weed management practices on growth and fibre yield of jute (*Corchorus capsularis*)

G. C. MISHRA¹ AND B. B. BHOL²

Jute Research Station, Orissa University of Agriculture and Technology,
Kendrapara 754 211

Received: February 1994

ABSTRACT

A study was carried out at Kendrapara during the rainy season (*kharif*) of 1990 and 1991, to determine the most effective method of weed-control in jute (*Corchorus capsularis* L.). Application of fluchloralin @ 1 kg/ha at 3 DBS, followed by 1 hand-weeding at 35 DAS reduced the weed dry matter significantly increased the plant growth, yield attributes and fibre yield over other herbicidal schedules and fetched maximum net profit. The next best treatment was pendimethalin @ 0.75 kg/ha at 1 DAS, followed by hand-weeding (twice).

Herbicides alone do not give satisfactory weed control in jute (*Corchorus* sp.) crop unless integrated with manual weeding (Saraswat and Sharma, 1983; Gogoi *et al.*, 1992) and consequently the growth and yield of jute are reduced considerably. In view of the above fact the present experiment was planned to study the efficacy of some herbicides either alone or in combination with manual weeding for weed management in jute (*Corchorus capsularis* L.).

MATERIALS AND METHODS

The study was conducted during the rainy season (*kharif*) 1990 and 1991 at the Jute Research Station, Kendrapara, under rainfed conditions with 'JRC 7447' Jute. The soil was clay loam with 0.82% organic carbon, 0.062% total nitrogen, 46 kg/ha available P, 190 kg/ha available K and pH

5.56. The experiment was laid out in randomized block design replicated 4 times with 12 treatments (Table 1). The crop was sown on 19 April 1990 and 26 April 1991, with a fertilizer dose of 60 kg N, 30 kg P₂O₅ and 30 kg K₂O/ha. Fluchloralin, pendimethalin and fluazifop-p-butyl were applied as per treatments indicated in Table 1.

RESULTS AND DISCUSSION

The weeds in the experimental plot in order of dominance were *Echinochloa colonum* (L.) Link, *Paspalum distichum* L., *Eclipta alba* (L.) Hassk., *Ageratum conyzoides* L., *Commelina benghalensis* L., *Sida cordifolia* L., *Cyperus iria* L., *Cyperus rotundus* L.

All the herbicidal schedules significantly reduced the weed dry-matter (Table 1) at 60

Present address: ¹Farm Superintendent, ²Associate Director of Research, National Agricultural Research Project, Regional Research Station, OUAT, Bhawanipatna, Kalahandi, Orissa 766 001.

Table 1. Influence of weed-control treatments on germination, drymatter and weed control efficiency in jute

Treatment	Rate (kg ai/ha)	Application time	Plant stand (0.1 million/ha)			Dry matter of weeds (g/m ²)			Weed-control efficiency
			1990 - 1991	Mean		1990	1991	Mean	
Fluazifop-p-butyl	0.4	Post-em. at 21 DAS	5.6	3.5	4.6	63.5	49.0	56.3	42.0
Fluazifop-p-butyl	0.6	Post-em. at 21 DAS	5.5	3.6	4.6	62.0	41.0	51.5	46.9
Fluazifop-p-butyl + 1 HW at 35 DAS	0.4	Post-em. at 21 DAS	5.7	3.8	4.8	51.8	24.0	37.9	60.9
Fluazifop-p-butyl + 1 HW (35 DAS)	0.6	Post-em. at 21 DAS	5.8	3.7	4.8	45.0	19.5	32.3	66.7
Hoeing and hand-weeding twice		21, 35 DAS	5.6	4.3	4.9	16.5	9.8	13.2	86.4
Fluchloralin	1.0	Pre-plant incorporation (PPI) 3 DBS	5.4	3.7	4.5	56.5	38.0	47.3	51.2
Fluchloralin	1.0	PPI, 7 DBS	5.3	3.9	4.6	61.8	36.3	49.0	49.5
Fluchloralin + 1 HW (35 DAS)	1.0	PPI, 3 DBS	5.3	3.9	4.6	30.3	13.8	22.5	77.3
Fluchloralin + 1 HW (35 DAS)	1.0	PPI, 7 DBS	5.5	4.2	4.9	43.5	18.8	31.2	67.8
Pendimethalin	0.75	pre-em. 1 DAS	5.6	4.0	4.8	53.5	34.8	44.0	54.6
Pendimethalin + 1 HW (35 DAS)	0.75	Pre-em. 1 DAS	5.6	4.1	4.8	37.3	15.3	26.3	72.9
Weedy check			5.5	3.3	4.4	116.0	78.0	97.0	
CD (P = 0.05)			NS	0.04	NS	22.6	7.7	11.6	

DAS, Days after sowing; DBS, days before sowing; HW, hand-weeding

days after sowing (DAS) in both the years compared with the weedy check. Hand-weedings twice (21 and 35 DAS) recorded the least weed dry-matter, followed by fluchloralin 1 kg/ha (incorporated 3 DBS), followed by 1 hand-weeding (35 DAS). These 2 treatments did not differ significantly and imparted higher weed-control efficiency over other schedules. Pendimethalin 0.75 kg/ha (1 DAS) followed by 1 hand-weeding (35 DAS) ranked third in reducing the weed dry-matter and in weed-control efficiency.

Effect on crop

All the herbicidal schedules significantly

gave higher fibre yield than weedy check in both the years (Table 2). Hand-weeding twice (21 and 35 DAS), fluchloraline 1 kg/ha (3 DBS) followed by one handweeding (35 DAS) and pendimethalin 0.75 kg/ha fb one hand-weeding (35 DAS) recorded higher fibre yield than the other weed-control schedules. Fluazifop-P-butyl, fluchloralin and pendimethalin when applied alone registered lower fibre yield than their application in conjunction with 1 hand-weeding at 35 DAS. These results establish the merit of integrated weed-management practice of herbicide followed by hand-weeding in securing weed-free condition for the crop in early stage. This results the plants to grow

Table 2. Influence of various weed-control treatments on growth, fibre yield and net profit of *capsularis* jute

Treatments	Rate (kg/ha)	Application time	Plant height at harvest (cm)			Basal diameter of the stem at harvest (cm)			Fibre yield (q/ha)			Net profit (Rs/ha)
			1990	1991	Mean	1990	1991	Mean	1990	1991	Mean	
Fluazifop-p-butyl	0.4	Post-em. at 21 DAS	227	225	266	1.68	2.02	1.85	21.09	16.94	19.01	223
Fluazifop-p-butyl	0.6	Post-em. at 21 DAS	278	269	274	1.78	1.93	1.84	21.85	16.67	19.26	252
Fluazifop-p-butyl + 1 HW at 35 DAS	0.4	Post-em. at 21 DAS	283	268	275	1.69	1.96	1.83	24.05	22.02	23.03	1,139
Fluazifop-p-butyl + 1 HW (35 DAS)	0.6	Post-em. at 21 DAS	280	278	279	1.81	1.95	1.88	24.21	23.29	23.75	1,675
Hoeing and hand-weeding twice		21, 35 DAS	2.90	291	291	1.90	2.37	2.13	28.72	28.61	28.67	322
Fluchloralin	1.0	Pre-plant incorporation (PPI) 3 DBS	2.95	270	282	1.84	1.83	1.83	24.13	20.34	22.23	1,213
Fluchloralin	1.0	PPI, 7 DBS	283	25	274	1.72	2.12	1.92	22.81	19.71	21.26	863
Fluchloralin + 1 HW (35 DAS)	1.0	PPI, 3 DBS	297	289	293	1.91	2.09	2.00	27.25	25.49	26.37	2,272
Fluchloralin + 1 HW (35 DAS)	1.0	PPI, 7 DBS	294	290	292	1.84	2.00	1.92	25.71	26.84	26.28	2,199
Pendimethalin	0.75	pre-em. 1 DAS	297	291	294	1.96	2.22	2.09	25.53	23.02	24.27	1,791
Pendimethalin + 1 HW (35 DAS)	0.75	PRe-em. 1 DAS	302	299	300	2.10	2.36	2.23	27.00	25.85	26.43	2,188
Weedy check			274	221	247	1.62	1.52	1.57	18.52	15.30	16.91	280
CD (P = 0.05)			16	22	15	0.18	0.37	0.20	4.13	4.93	3.06	

DAS, Days after sowing; DBS, days before sowing; HW, hand-weeding

taller and healthier with more basal diameter ultimately leading to higher fibre yield. Higher clay content of the experimental field, tight adsorption of dinitroaniline herbicides (Klingman and Aston, 1982) such as fluchloraline and pendimethalin tried and efficient control of annual grasses and broad-leaf weeds by these herbicides brought weed-free situation during the earlier growth phase. Integration of hand-weeding at 35 DAS maintained the weed-free situation for longer period and boosted the growth and yield of the crop.

The net profit (Table 2) was maximum when fluchloralin was incorporated 3 DBS

supplemented by 1 hand-weeding (35 DAS). Hand-weeding twice incurred a loss owing to higher cost of production.

REFERENCES

- Gogoi, A. K., Kalita, H., Pathak, A. K. and Deka, J. 1992. Chemical weed control in *capsularis* jute. *Indian Journal of Weed Science* 24 (3, 4) : 68-70.
- Saraswat, V. N., and Sharma, D. K. 1983. Comparative efficiency of fluchloraline and diphenamid in controlling weeds in jute field. *Pesticides* 17 (7) : 39-41.
- Klingman, G. C. and Aston F. M. 1982. *Weed Science-Principles and Practices* edn 2, 155 pp. A Wiley Interscience Publication, John Wiley and Sons, New York.