

## Effect of fertilizer, weed-control methods and row spacings in white jute (*Corchorus capsularis*)

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### ABSTRACT

An experiment conducted during 1988 and 1989 revealed that the fibre yield of jute (*Corchorus capsularis* L.) not significantly affected due to fertility levels (50, 100 and 150% of the recommended dose, viz. 60, 30 and 30 N, P and K kg/ha). However, the yield was reduced only by 10.55% with 50% dose and increased by 0.81% with 150% dose as compared with 100% recommended dose which recorded the maximum net return (Rs 4,856) and net return per rupee invested (1.08). Farmers' practice although recorded the highest yield giving 153.46% over the control, chemical + mechanical method recorded the highest net return per rupee (1.38) invested. Fibre yield was not affected due to variation in spacing (10, 20 and 30 cm); however, 30 cm row spacing produced maximum net return (Rs 5,263) and net return per rupee invested (1.24).

With increase in price of inputs like seeds, fertilizer and labour etc., it has become necessary to develop matching management practices for the farmers to sustain agricultural production (Gupta and Rai, 1990). The average fibre yield of jute (*Corchorus* sp.) can be improved through proper variety, good soil-fertility management and spacing. Keeping this in view, the present study was undertaken to compare the efficiency of different fertility levels, weed-control methods and row spacings in white jute (*Corchorus capsularis* L.).

### MATERIALS AND METHODS

The experiment was conducted in 1988 and 1989 in a double split-plot design with 3 fertility levels in the main plot (50, 100 and 150% of the recommended dose, i.e. 60, 30 and 30 N, P and K kg/ha), 5 weed-control

methods in the sub-plots [chemical fluchloralin @ 1.0 kg a.i./ha, preplant application, chemical + mechanical (fluchloralin @ 1.0 kg a.i./ha + 1 hoeing and weeding at 20 days after sowing), farmer's practice (2 hoeings and weedings at 20 and 35 days after sowing), weed free and unweeded control]] and 3 row spacings in the sub-subplots (10, 20 and 30 cm) with 3 replications. The soil was moderately drained loamy in nature (organic carbon 0.09% total N 287 kg/ha available P 40 kg/ha and K 145 kg/ha and pH 5.8), 'JRC 212' white jute was sown in the third week of April with 50% N as basal with full P and K and rest 50% N as top-dressing at 20 days. The crop was harvested at 120 days after sowing. The weather was very much conducive for growth of the jute crop in 1988 with moderate rainfall of 807.70 mm received in 65 rainy days during

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**Table 1.** Comparative efficiency of fertility levels, weed control methods and row spacings in jute

Treatment	Plant height (m)		Basal diameter (cm)		Fibre yield (q/ha)		Pooled yield (q/ha)	Weed dry weight g/0.5 m <sup>2</sup> *		Cost of cultivation (Rs/ha)	Gross return (Rs/ha)**	Net profit (Rs/ha)**	Net profit/Re**
	1988	1989	1988	1989	1988	1989		1988	1989				
<i>Fertility levels</i>													
Lower (50%)	3.00	2.48	2.57	2.29	24.63	21.82	23.22	4.22	5.33	4,208	8,411	4,203	0.98
Optimum (100%)	3.03	2.72	2.58	2.30	30.21	21.71	25.96	3.44	8.03	4,513	9,369	4,856	1.08
Higher (150%)	3.31	2.90	2.64	2.75	29.79	22.57	26.17	3.37	7.44	4,792	9,535	4,743	0.99
CD (P = 0.05)	0.19	1.10	NS	0.05	4.57	NS	NS	0.08	0.10				
<i>Weed-control method</i>													
Chemical	2.83	2.52	2.45	2.33	25.53	16.79	21.16	4.96	9.03	3,574	7,748	4,174	1.17
Chemical + mechanical	3.39	2.88	3.11	2.68	33.78	22.02	27.89	2.62	7.39	4,247	10,103	5,856	1.38
Farmers' practice	3.74	2.94	3.10	2.65	35.64	30.37	33.00	2.61	6.00	5,391	11,795	6,404	1.20
Weed free	3.77	2.90	2.81	2.59	36.51	24.56	30.53	1.00	1.00	6,151	11,239	5,086	0.83
Unweeded control	1.85	2.27	1.51	1.98	9.63	16.43	13.02	7.12	10.66	3,150	4,640	1,490	0.48
CD (P = 0.05)	0.16	0.08	0.18	0.06	3.24	5.12	7.18	0.10	0.28				
<i>Row spacing</i>													
Closer (10 cm)	2.90	2.43	2.40	2.07	28.31	20.17	24.23	3.56	6.41	4,813	8,692	3,839	0.80
Optimum (20 cm)	3.15	2.47	2.61	2.51	28.95	21.62	25.28	3.66	7.19	4,491	9,191	4,700	1.01
Wider (30 cm)	3.30	2.93	2.78	2.76	27.39	24.30	25.84	3.80	7.21	4,209	9,472	5,263	1.24
CD (P = 0.05)	0.05	0.06	0.05	0.05	NS	2.12	NS	0.04	0.16				

\*. Values in  $\bar{x} - 1$ ; \*\*, average data of 2 years.

the growth period, which facilitated better intercultural operation compared with heavy rainfall of 1,012.90 mm received in 75 days in 1989.

#### RESULTS AND DISCUSSION

Application of 100% recommended dose gave significantly higher fibre yield in 1988 than lower fertility (50%) due to increase in plant height and basal diameter (Table 1). Hassan reported similar results in fertility level up to (150%) level resulted in lower yield due to adverse effect on plant population and lower fibre recovery. The results confirm the findings of Saha *et al.* (1985). However in 1989, when the climate was not conducive for the growth of the crop, increased fertility level did not show any significant difference in yield, which might be attributed due to unfavourable climatic condition and higher nutrient depletion owing to increase in weed biomass (Pathak and Saikia, 1982). The pooled data did not show significant difference, although yield was reduced by 10.55% with 50% dose and increased by 0.8% with 150% dose. The results confirm the findings of Mandal *et al.*, (1983). Optimum fertility recorded the maximum gross return (Rs 9,369), net profit (Rs 4,856) and net return per rupee (1.08) invested.

Weed-free treatment showed maximum increase in fibre yield, but was statistically at par with farmers' practice and chemical + mechanical method due to higher weed-control efficiency in 1988; whereas in 1989 farmers' practice gave the maximum fibre yield and produced significantly superior to chemical + mechanical and weed free. Poor yield in weed-free condition was due to repeated weedings in wet condition of soil that affected the crop growth (Table 1). The highest net return was obtained from farmers' practice, but net return per rupee invested was highest with the chemical + mechan-

ical method. This is in agreement with Sahoo and Saraswat (1988).

No significant difference existed due to varied plant population in fibre yield of jute in 1988. Although wider row spacing (30 cm) resulted in better plant height and basal diameter (Liang *et al.*, 1984), the yield got reduced due to lower plant population in this case. But in 1989, as the crop growth with the closer row spacing was severely stunted due to unfavourable weather conditions, the fibre yield was maximum with the wider (30 cm) row spacing. The pooled data showed no significant difference of row spacings and the yield was reduced only 4.15% with closer and increased only by 2.22% with 30 cm row spacing. The net return and net return per rupee invested were higher with the wider row of 30 cm. This is in agreement with Mishra *et al.* (1991).

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