

observed. The organic matter undergoes decomposition and releases the ions readily available to the plants. Thus favourable effect from FYM on availability of P is always more consistent to the succeeding crop rather than plant crop. Similar findings have also been reported by Indulkar and Malewar (1990).

Residual effect on available K content of soil

The available K content was the highest in the NPK plus FYM treatment (Table 1). The K content has declined from the initial stages. This might be due to absorption of more of available K by the crops, and also to a certain extent to fixation in the soil as the time advanced due to drying. This is in accordance with the result of Mani and Ramanathan (1980).

Residual effect on yield and N, P, K uptake of black gram

Application of 100% NPK plus ZnSO₄ once in a cropping sequence has recorded the highest grain and haulm yield of black gram (Table 2) which might be due to increased availability of nutrients and in turn contributed to more responses by the crop because of zinc addition. Similar results have

also been reported by Indulkar and Malewar (1990).

The N, P, K uptake by black gram was the highest in the NPK plus ZnSO₄ applied once in a cropping sequence as in the case of black gram yield. Similar results of highest N, P, K uptake was reported by Sakal and Sinha (1983) and Rehman *et al.* (1988).

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WEED MANAGEMENT IN OLITORIUS JUTE

N. ASOKARAJA and S. JEYARAMAN

Water Technology Centre, Tamil Nadu Agricultural University, Coimbatore 641 003

ABSTRACT

Experiments were conducted during 1987-88 in summer seasons at the Cotton Breeding Station, Tamil Nadu Agricultural University, Coimbatore; to evolve suitable weed management practice for olitorius jute cv.JRO 524. Herbicides *viz.*, fluchloralin, fluazipop-p butyl and pendimethalin were compared with conventional method of hand weeding twice at 21 and 35 days after sowing and unweeded check. The plots hand weeded twice recorded the lowest weed dry matter and higher plant height, basal stem diameter and green plant weight in both years. Among the herbicides, fluchloralin 1.0 kg/ha applied as pre-plant spray at three days before sowing combined with one hand weeding at 35 days after sowing and at three or seven days before sowing recorded comparable yield with hand weeding twice during 1987 and 1988 respectively. The herbicide pendimethalin was the least effective to jute in both years.

The growth of weeds with crops in the jute fields affects the crop adversely and causes heavy loss. If timely weeding is not done or if it is incomplete, fibre yield of jute may be reduced to half or even more and if it is neglected the crop as such may have to be abandoned (Saraswat and Mitra, 1977). The national average fibre yield is

1380 kg/ha while it is 4200 kg/ha at the research stations (Anonymous, 1976). The large variations in the fibre yield are mainly due to the input constraints of which competition due to weeds is one of the major constraints. The crop faces a very severe crop-weed competition in early growth phase, particularly upto 60 days after sowing

Table 1. Effect of weed control treatments on weed dry weight, yield attributes and yield of *Olitorius jute* (Summer, 1987).

Treatments	Total weed dry wt. at harvest (g/18.9m ²)	Plant height at harvest (cm)	Average basal diameter of plants (cm)	Plant population at harvest in 18.9m ²	Plant fresh weight (kg/18.9m ²)
T ₁ - Fluazipop-p-butyl 0.40 kg/ha (21 DAS)	1439	219.4	1.25	530	65.00
T ₂ - Fluazipop-p-butyl 0.60 kg/ha (21 DAS)	1348	219.8	1.30	765	72.00
T ₃ - T ₁ + one hand weeding (35 DAS)	703	235.2	1.60	841	78.00
T ₄ - T ₂ + one hand weeding (35 DAS)	378	236.1	1.69	856	81.67
T ₅ - Hand weeding twice (21 & 35 DAS)	156	240.4	2.02	993	106.00
T ₆ - Fluchloralin 1.0 kg/ha (3 DAS)	764	234.7	1.62	701	73.00
T ₇ - Fluchloralin 1.0 kg/ha (7 DBS)	852	232.3	1.59	637	65.00
T ₈ - T ₆ + one hand weeding (35 DAS)	187	238.4	1.97	911	91.00
T ₉ - T ₇ + one hand weeding (35 DAS)	234	236.3	1.84	844	84.00
T ₁₀ - Pendimethalin 0.75 kg/ha (1 DBS)	1159	227.9	1.43	120	41.33
T ₁₁ - T ₁₀ + one hand weeding (35 DAS)	854	231.9	1.47	461	60.33
T ₁₂ - Unweeded check	2482	210.1	1.13	644	63.33
CD (P = 0.05)	564	NS	0.29	223	20.91

NS : Not Significant

(DAS). The available literature on weed control in jute crop is rather limited and hence an attempt was made to fix a suitable weed control practice for the jute crop.

MATERIALS AND METHODS

Two field experiments were conducted during 1987-88 in summer seasons at the Tamil Nadu Agricultural University, Coimbatore to evolve a suitable weed control method for the jute cv.JRO

Table 2. Effect of weed control treatments on weed dry weight, yield attributes and yield of *Olitorius jute* (Summer, 1988).

Treatments	Total weed dry wt. at harvest (g/18.9m ²)	Plant height at harvest (cm)	Average basal diameter of plants (cm)	Plant population at harvest in 18.9m ²	Plant fresh weight (kg/18.9m ²)
T ₁ - Fluazipop-p-butyl 0.40 kg/ha (21 DAS)	2418	150.8	1.01	4306	77.67
T ₂ - Fluazipop-p-butyl 0.60 kg/ha (21 DAS)	1117	167.9	1.29	4008	93.06
T ₃ - T ₁ + one hand weeding (35 DAS)	1337	163.4	1.14	4401	90.16
T ₄ - T ₂ + one hand weeding (35 DAS)	1061	172.1	1.33	4283	109.31
T ₅ - Hand weeding twice (21 & 35 DAS)	592	196.1	1.47	4618	152.38
T ₆ - Fluchloralin 1.0 kg/ha (3 DAS)	1580	159.2	1.02	4031	81.16
T ₇ - Fluchloralin 1.0 kg/ha (7 DBS)	1174	163.7	1.29	4285	91.27
T ₈ - T ₆ + one hand weeding (35 DAS)	641	188.3	1.40	4537	127.94
T ₉ - T ₇ + one hand weeding (35 DAS)	858	178.5	1.33	4489	119.58
T ₁₀ - Pendimethalin 0.75 kg/ha (1 DBS)	2892	145.0	0.97	3596	63.12
T ₁₁ - T ₁₀ + one hand weeding (35 DAS)	1578	160.0	1.12	4219	86.24
T ₁₂ - Unweeded check	3506	136.1	0.96	3649	60.90
CD (P = 0.05)	1374	33.52	0.25	69.57	38.51

NS : Not Significant

524. The crop was raised with the spacing of 25 cm between rows and 5-7 cm between plants. The soil was sandy loam. The experiments were conducted in a randomized block design with four replications. The net plot size was 4.5m x 4.2m. The treatments were as follows:

T₁ - Fluazipop-p-butyl 0.40 kg/ha as post emergence

(21 DAS)

T₂ - Fluazipop-p-butyl 0.60 kg/ha as post emergence

(21 DAS)

T₃ - T₁ + one hand weeding (35 DAS)

T₄ - T₂ + one hand weeding (35 DAS)

T₅ - Hand weeding twice (21 & 35 DAS)

T₆ - Fluchloralin 1.0 kg/ha as pre-plant (3 DBS)

T₇ - Fluchloralin in 1.0 kg/ha as pre-plant (7 DBS)

T₈ - T₆ + one hand weeding (35 DAS)

T₉ - T₇ + one hand weeding (35 DAS)

T₁₀ - Pendimethalin 0.75 kg/ha as pre-plant (1 DBS)

T₁₁ - T₁₀ + one hand weeding (35 DAS)

T₁₂ - Unweeded control

RESULTS AND DISCUSSION

The results of the weed control experiment conducted during 1987 are given in Table 1. The weed dry weight was the lowest (156 g/net plot) in T₅ which received two hand weeding and it was on par with T₈, T₉, T₄ and T₃. The highest weed dry weight of 2482 g/net plot was recorded in the unweeded control. The plant height was not significantly different among the treatments. The basal diameter of plants at harvest was higher in T₅ and was on par with T₈ and T₉ and significantly superior to rest of the treatments. The lowest basal diameter was recorded in unweeded control. The plant population at harvest varied significantly among the treatments. The treatments T₅, T₈, T₄, T₉, T₃ and T₇ recorded higher plant population wherein phytotoxicity of herbicides (fluchloralin and fluazipop-p-butyl) was not noticed. The herbicide pendimethalin resulted in moderate to severe phytotoxicity to jute crop and thus reduced the plant population significantly. With regard to

plant green weight, T₅ recorded higher plant green yield and was on par with T₈. The lowest plant green weight of 41.33 kg/net plot was recorded in T₁₀ due to phytotoxicity of pendimethalin.

The data on weed dry weight, and yield attributes of jute crop due to weed control treatments for the experiment conducted during 1988 are given in Table 2. The treatment T₅ produced the higher plant height (196.1 cm), basal stem diameter (1.47 cm), plant population (4618/net plot), plant green weight (152.38 kg/net plot) and the lowest weed drymatter (592 g/net plot). Among the herbicidal treatments fluchloralin 1.0 kg/ha as pre-plant application (3 days before sowing, DBS) with one hand weeding at 35 DAS (T₈), fluchloralin 1.0 kg/ha (7 DBS) with one hand weeding at 35 DAS (T₉) and fluazipop-p-butyl 0.60 kg/ha as post emergence at 21 DAS with one hand weeding (T₄) were on par with hand weeding twice (T₅) in controlling the weeds. However, the plant green weight was maximum in T₅ and was on par with fluchloralin 1.0 kg/ha applied either at three or seven DBS with one late hand weeding at 35 DAS (T₈ and T₉).

It is concluded that hand weeding twice (21 and 35 DAS) produced better weed control in jute crop and was on par with fluchloralin 1.0 kg/ha applied either at three or seven DBS combined with one hand weeding at 35 DAS. Pathak and Saikia (1983) reported that hand weeding twice (21 and 35 DAS) was the best for jute. However, during continuous rains, the field becomes wet posing problem in hand weeding, besides the hand weeding is a costly, time consuming and laborious exercise. Under such conditions, fluchloralin 1.0 kg/ha as pre-plant spray with one late hand weeding at 35 DAS would be an effective weed control practice in jute crop.

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