

Weed management in rainfed upland cotton (*Gossypium hirsutum*)

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ABSTRACT

An experiment was conducted during 1989-90 and 1990-91 to study the effect of weed management in rainfed 'AHH 468' upland cotton (*Gossypium hirsutum* L.) at Akola. Treatment having normal weeding and hoeing recorded highest seed-cotton yield (722 kg), followed by application of basalin as pre-emergence along with 2 weedings and 3 hoeings (658 kg) which reduced the weed intensity by 86.2% compared with the control. Smothering crop greengram (*Phaseolus radiatus* L.) could not show any significant effect either in increasing the yield of cotton or reducing the weed intensity. Normal weeding and hoeing gave the higher net monetary returns of Rs 2,312/ha.

Upland cotton (*Gossypium hirsutum* L.) is very sensitive to weed competition and is affected in early stages by the presence of weeds. Hence weed control at later stage may not be useful to compensate the loss caused by weeds in early stages. Due to shortage of labour and sometimes due to unworkable field conditions, it may not be possible to undertake weeding and interculturing at proper time by manual labours. In such circumstances, it becomes necessary to use weedicides to control the weeds. Therefore, an experiment was carried out to study the effect of weedicide alone and in combination of cultural practices in controlling the weeds of rainfed upland cotton.

MATERIALS AND METHODS

The field experiment was conducted with a hybrid 'AHH 468' of cotton during the rainy seasons (*kharif*) 1989-90 and 1990-91 at Akola under rainfed condition. The

experimental soil was clayey in texture, low in nitrogen and phosphorus and rich in potassium content. The experiment was laid out in randomized block design with 3 replications. The treatments were: harrowing just before sowing (T_1), spray of basalin as pre-emergence weedicide @ 1.25 a.i. litres/ha (T_2), T_2 + 1 weeding + 1 hoeing (T_3), T_2 + 1 weeding + 2 hoeings (T_4), T_2 + 1 weeding + 3 hoeings (T_5), T_2 + 2 weedings + 1 hoeing (T_6), T_2 + 2 weedings + 2 hoeings (T_7), T_2 + 2 weedings + 3 hoeings (T_8), normal weeding + hoeing (T_9), smothering crop like greengram (*Phaseolus radiatus* L.) (T_{10}) and unweeded (T_{11}). Pre-emergence spray of basalin (Fluchloralin) was given and then mixed with soil with blade harrow before sowing. Recommended dose of fertilizer (25, 25 and 25 kg N, P and K/ha) was applied to the experimental area uniformly at sowing. Remaining dose of 25 kg N/ha was given at square-initiation stage. Cotton was sown on 13 July 1989 and 4 July

Table 1. Effect of weedicides and cultural operations on ancillary characters, yield and dry-weed weight and economics of cotton

Treatment	Bolls/ plant		Plant height (cm)		Fruiting bran- ches/plant*	Seed-cotton yield (kg/ha)		Dry-weed weight (kg/ha)		Total expenditure (Rs/ha)	Net Monetary (Rs/ha)
	A	B	A	B		A	B	A	B		
T ₁	1.7	4.1	54.5	67.1	12.1	96	134	5,883	6,840	1,770	-679
T ₂	2.3	4.8	63.7	73.8	12.7	143	200	4,533	4,400	2,737	-1,109
T ₃	3.7	5.3	68.7	94.6	16.3	223	220	3,954	3,660	3,141	-1,350
T ₄	4.7	8.4	65.0	89.6	15.4	270	236	3,569	3,320	3,182	-1,261
T ₅	8.5	6.6	71.0	107.8	17.5	486	269	2,508	3,030	3,236	-1,046
T ₆	6.7	8.3	67.7	97.1	16.4	397	339	2,990	3,140	3,370	-611
T ₇	5.9	6.9	66.7	96.2	16.5	347	357	2,122	2,510	3,413	-507
T ₈	12.3	13.6	71.5	116.6	19.9	752	544	1,157	915	3,579	-849
T ₉	12.4	16.0	76.5	116.0	20.2	768	677			3,199	+2,312
T ₁₀	8.3	2.9	71.2	68.3	12.2	486	100	4,630	8,171	1,726	-912
T ₁₁	1.0	1.9	46.7	66.7	11.4	58	48	6,872	8,290	1,667	-1,276
CD (P = 0.05)						202.2	64.3				
CV %						24.6	13.6				

Details of treatments are given under Materials and Methods

A, 1989-90; B, 1990-91

* Mean of 2 years

1990. Interculture operation as specified in the treatments were followed. The weight of dry weeds at the first picking stage was recorded.

RESULTS AND DISCUSSION

Normal weeding and hoeing as and when required (T_9) recorded more number of bolls, fruiting branches/plant and plant height (Table 1), compared with the other treatments.

During both the years treatments T_9 and T_8 recorded higher seed-cotton yield/ha than the other weed-control methods, the former 2 being at par. In T_9 , 3 weedings and 3 hoeings were effected, so it could be indicated that application of baseline weedicide as pre-emergence could save only 1 weeding. These results are in agreement with the findings of Tanker and Mundhe (1984) and Bhalerao *et al.* (1989). On the basis of 2-year mean, harrowing just before sowing and baseline as pre-emergence increased the seed-cotton yield by 62 and 118 kg/ha compared with the control. Pre-emergence spray of baseline along with combination of 1 weeding + 3 hoeings, 2 weedings + 1 hoeing and 2 weedings + 2 hoeings recorded similar yields. Smothering of greengram crop was neither effective in increasing yield of cotton nor it was effective in reducing the weed intensity.

Dry weight of weeds

The harrowing just before sowing and

baseline as pre-emergence reduced the weed intensity by 14.4 and 34.0%, and 16.9 and 46.9% respectively during 1989-90 and 1990-91 compared with unweeded (control).

Three weedings and 3 hoeings controlled the weeds 100%, followed by the application of baseline as pre-emergence + 2 weedings and 3 hoeings, reducing the weed intensity by 83.4 and 89.0% during 1989-90 and 1990-91 respectively.

Economic analysis

Normal weeding and hoeing and pre-emergence spray of baseline along with 2 weedings and 3 hoeings gave net monetary returns of Rs 2,312 and Rs 849/ha respectively (Table 1). Rest of the treatments were not economical. Gomase *et al.* (1989) reported more net monetary returns with normal weeding and hoeing treatments.

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