

Crop–weed competition in clusterbean (*Cyamopsis tetragonoloba*) under rainfed condition

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ABSTRACT

A field experiment was conducted on sandy-loam soil of Gwalior, during the rainy (*kharif*) season of 1992 and 1993, to study the crop–weed competition in clusterbean or guar [*Cyamopsis tetragonoloba* (L.) Taubert] under rainfed condition. Amongst different weed-control treatments, weed-free plot had the maximum seed yield (19.1 q/ha) and weed-control efficiency (79.3 %). Treatment weed free for 60, 45 and 30 days after sowing and interculture at 30 days after sowing were next in order. An unchecked weed growth in clusterbean caused 47% reduction in seed yield. In order to obtain higher seed yield of clusterbean the crop should be kept free from weeds for the first 30 days after sowing.

Key words : Clusterbean, Weed control, Weed-control efficiency, Crop–weed competition

Clusterbean is an important crop of northern Madhya Pradesh which often suffers severe competition from weeds. The magnitude of losses caused by weeds, however depends largely on weed flora and its intensity in the field. Yadav *et al.* (1991) recorded 61% reduction in seed yield of clusterbean of crop left without control of weeds. As information on crop–weed competition in clusterbean is scanty, the present experiment was conducted to establish the critical stage of crop–weed competition under the condition of northern belt of Madhya Pradesh.

MATERIALS AND METHODS

The field experiment was conducted at the Research Farm of Agriculture College, Gwalior, during the rainy season of 1992 and 1993. The treatment consisted of weedy check, weedy for 15, 30, 45 and 60 days after sowing, 1 interculture at 30 days after sowing, weed-free for 15, 30, 45 and 60 days after sowing, and weed-free plot, in randomized block design with 4 replications. The soil was sandy loam with neutral pH, medium in available P, K and organic carbon but low in available N content. A nutrient dose of 20, 50 and 20 kg N,P and

K/ha was given at the time of sowing. Variety 'HG 75' was sown during third week of July. Data were recorded for plant height, number of branches, pods/plant, seed yield and weed biomass. The secondary data were generated for weed-control efficiency and weed index.

RESULTS AND DISCUSSION

Weed-control treatments significantly influenced all the growth characters; viz. plant height, branches/plant, yield attributes like pods/plant, quality parameters, protein and gum content, and values of these parameters were maximum in weed-free plot.

Weed-free plot although gave the highest seed yield, but it was statistically similar with 60 and 45 days weed-free period. However, the seed yield at 30 days and 45 days weed-free period was at par

with each other (Table 2). Hence it indicates that weed-free period beyond 30 days was not necessary. The results confirm the findings of Mandal and Singh (1990) in groundnut.

Among all the weed-control treatments, weed-free treatment showed the maximum weed-control efficiency (79.3%), resulting in the highest seed yield. The weed biomass and weed index were maximum and seed yield was minimum in the control plot (weedy check).

Reduction in the yield due to weed competition throughout the cropping period was 47%. When weed-free conditions were maintained only up to the first 15, 30, 45 and 60 days after sowing, the reduction in seed yield was 30.4, 16.2, 4.2 and 2.6% respectively. The presence of weeds during every crop stage reduced the crop yields. The production levels in general showed

Table 1. Effect of weed-control treatments on growth, yield and quality of clusterbean

Treatment	Plant height (cm)		Branches/ plant		Pods/ plant		Seed yield (q/ha)		Protein content (%)	Gum content (%)
	1992	1993	1992	1993	1992	1993	1992	1993		
Weed check	100.0	124.8	4.7	9.0	33.0	57.5	8.1	12.2	35.8	28.0
Weedy for 15 days	115.1	158.1	4.5	11.4	33.9	96.4	8.8	15.5	36.8	28.4
Weedy for 30 days	112.3	156.0	4.5	11.7	46.2	88.3	12.2	17.0	38.2	28.9
Weedy for 45 days	118.6	142.4	4.7	9.3	30.4	89.0	9.3	15.7	37.4	28.6
Weedy for 60 days	125.2	147.4	4.6	9.2	37.2	87.0	8.6	12.7	36.4	28.1
Weed free for 15 days	121.9	158.1	5.2	10.8	37.0	100.7	9.3	17.4	36.6	28.2
Weed free for 30 days	132.1	151.6	7.5	10.5	48.4	103.7	12.7	19.4	38.9	29.1
Weed free for 45 days	129.1	160.0	7.8	11.6	51.9	110.0	14.3	22.3	38.5	29.2
Weed free for 60 days	140.0	174.0	8.4	12.0	55.1	112.0	15.4	21.8	39.0	29.2
Weed free control	142.0	176.1	8.5	13.5	57.8	118.8	15.4	22.9	39.1	29.4
Interculture at 30 days	129.8	177.0	7.7	10.2	44.3	92.1	12.7	18.2	36.7	28.9
CD (P = 0.05)	13.5	18.5	2.6	2.0	16.6	19.1	2.7	3.0	0.4	0.3

Data on protein and gum content are given on pooled basis

Table 2. Effect of weed-control treatments on seed yield, dry weight of weeds, weed index and weed-control efficiency (pooled value)

Treatment	Seed yield (q/ha)	Dry weight of weed at harvest (q/ha)	Weed index (%)	Weed-control efficiency (%)
Weed check	10.1	62.2	47.1	
Weedy for 15 days	12.1	45.4	36.6	27.0
Weedy for 30 days	14.6	30.1	23.5	51.6
Weedy for 45 days	12.5	19.5	34.5	68.6
Weedy for 60 days	10.6	19.5	44.5	68.6
Weed free for 15 days	13.3	44.9	30.4	27.8
Weed free for 30 days	16.0	38.7	16.2	37.8
Weed free for 45 days	18.3	20.1	4.2	67.7
Weed free for 60 days	18.6	17.0	2.6	72.7
Weed free control	19.1	12.9		79.3
Interculture at 30 days	15.4	35.8	19.4	42.4
CD (P = 0.05)	2.4	4.9	6.5	5.4

decline trend with increasing delay in weeding and also the losses were higher when the weedings were stopped early. However, the most severe reduction occurred within the first 15 to 30 days after sowing which can be taken as critical period of crop-weed competition in *guar* (Table 2). These findings confirm the results of Ved Prakesh *et al.* (1982).

In the present study, a reduction in dry matter from 62.2 q/ha in weeded control to 38.7 q/ha in 30 days weed-free period resulted in better seed yield of 16.0 q/ha, which was at par with 45 days weed-free period. Hence a weed-free period of 0-30 days was necessary under this situation.

Thus crop-weed competition showed

that a weed-free period of 30 days is needed for obtaining the higher yield of *guar* or clusterbean.

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