

Crop-weed Competition Studies in Summer Sown Blackgram (*Vigna mungo* L.)

Arun Kumar and A. N. Tewari

Department of Agronomy

Chandra Shekhar Azad University of Agriculture & Technology, Kanpur-208 002 (U. P.), India

ABSTRACT

A field experiment was conducted for two summer seasons to identify critical period in irrigated summer sown blackgram (*Vigna mungo* L.) at Kanpur. Unchecked weed competition throughout the crop growth period caused a reduction of 40.10% in seed yield. Initial weed condition for the first 10 days after sowing did not cause significant loss in yield. Weed-free conditions maintained 40 days after sowing could not bring significant increase in seed yield. The critical period of crop-weed competition thus lies between 10-40 days after sowing in irrigated summer sown blackgram.

INTRODUCTION

Blackgram (*Vigna mungo* L.) is grown in sizeable area during summer season under assured irrigation facilities as a sequence crop after harvesting of potato, mustard, sugarcane, etc. in northern India. Weeds are a major constraint in limiting the productivity of this crop. The loss due to weeds in this crop has been reported to the extent of 42-64% in seed yield of summer greengram (Singh *et al.*, 1999) and 50-80% in summer mash. The critical period of crop-weed competition has been identified in most of legumes especially grown during rainy season. However, information pertaining to critical period of crop competition is scanty in the crops raised during summer under irrigated condition. Owing to higher temperatures and frequent irrigations, the growth of obnoxious weeds like *Cyperus rotundus* and *Trianthema monogyna* becomes very aggressive, which ultimately affects the critical period of crop-weed competition. With this background, the present investigation was undertaken.

MATERIALS AND METHODS

A field experiment was conducted during two summer seasons at Students' Instructional Farm of

C. S. Azad University of Agriculture & Technology, Kanpur. Ten treatments viz., weedy for the first 10, 20, 30, 40 days after sowing and till harvest and weed-free for the first 10, 20, 30, 40 days after sowing and till harvest were laid out in a randomized block design with four replications. Soil was sandy loam with low in organic carbon and phosphorus and medium in potassium. Soil reaction was slightly alkaline. Pant Urd-19, a variety of blackgram maturing within 80-85 days, was sown at 30 cm apart during second week of March and harvested during first week of June during both the years. A uniform application of 100 kg diammonium phosphate supplying 18 kg N and 46 kg P₂O₅ ha⁻¹ was applied basally. Thinning of extra plants was done 10 days after sowing to maintain optimum plant population. Plot size was kept 4.50 m x 3.50 m accommodating 15 rows in gross plots.

RESULTS AND DISCUSSION

Effect on Weeds

The major weed flora were : *Cyperus rotundus*, *Sorghum halepense*, *T. monogyna* and *C. benghalensis* during both the years. There was progressive increase in the population of *C. rotundus*, *S. halepense*, *T. monogyna* and *C.*

Table 1. Effect of different treatments on weed density (No. m⁻²), dry matter (g m⁻²), pods plant⁻¹, weight of grains plant⁻¹ (g) and grain yield (kg ha⁻¹) (Average of two crop seasons)

Treatment	<i>C. rotundus</i>	<i>S. halepense</i>	<i>T. monogyna</i>	<i>C. benghalensis</i>	Dry matter (g m ⁻²)	Pods plant ⁻¹	Weight of grains plant ⁻¹ (g)	Grain yield (kg ha ⁻¹)
Weedy till 10 DAS only	18.55	18.33	18.33	16.78	313.52	77.22	14.99	980
Weedy till 20 DAS only	29.44	21.11	24.66	21.99	339.30	73.31	13.55	901
Weedy till 30 DAS only	30.99	27.11	28.33	26.89	385.18	68.99	12.50	742
Weedy till 40 DAS only	38.99	28.33	30.89	333.11	428.18	65.28	10.64	662
Weedy throughout	52.11	32.89	40.44	36.99	468.06	61.67	9.39	578
Weed-free till 10 DAS only	39.66	29.11	35.22	33.11	403.18	65.68	10.83	665
Weed-free till 20 DAS only	29.55	24.99	30.22	30.22	376.66	69.75	11.94	786
Weed-free till 30 DAS only	26.11	19.66	27.11	23.33	310.08	73.44	12.89	879
Weed-free till 40 DAS only	21.20	16.22	21.22	17.55	289.75	75.57	14.01	947
Weed-free throughout	7.89	7.89	7.89	7.89	7.89	76.86	15.07	975
LSD (P=0.05)		0.27			0.45	3.24	0.81	48

DAS-Days after sowing.

benghalensis with increase in duration of weed infestation and appreciable reduction in weed population was registered when weed infestation was checked periodically (Table 1). Similarly, significant decrease in weed accumulation was recorded when competition free environment prolonged from 10-40 days after sowing and throughout. The highest weed weight was estimated under weedy check throughout closely followed by weedy upto 40 days stage.

Effect on Crop

The higher yield was obtained when crop was sown in absence of weed competition (974 kg ha⁻¹) closely followed by weedy condition till 10 days after sowing (963 kg ha⁻¹) and the variation was non-significant (Table 1). Weedy throughout crop period caused a reduction of 40.1% in grain yield. The overall contribution of weed-free period provided only till 10, 20, 30 and 40 days after sowing was found to be 31.79, 19.3, 9.8 and 2.87% over weed-free throughout crop period. Gogoi *et al.*

(1992) also reported that weedy upto 10 days, weed-free upto 30-40 days and season long weed-free were at par in terms of grain yield. It was thus inferred that the critical period of weed competition lies between 10 to 40 days after sowing. This could be attributed to reduce crop-weed competition during initial 10 days after sowing. Similarly, crop smothered weed growth 40 days after sowing resulting in no significant reduction in grain yield. Saraswat and Mishra (1993) found that initial 20-40 days period was very critical for short duration rainy season and summer pulses.

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