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Response of Summer Blackgram to Irrigation Schedules and Weed Management Practices

Key words : Blackgram, Economics, Irrigation, Weed management, Yield.

Blackgram is grown during summer in Andhra Pradesh when the available water supply is not adequate for rice and other crops. Among various techniques advocated for economy in water utilization, proper scheduling of irrigation water assumes greater significance. Application of irrigation water either in excess or in deficit will adversely affect the blackgram yield. Hence, optimization of irrigation schedule plays a vital role. Further, the productivity can be greatly improved by controlling the weeds with suitable weed management practices. In this context, the present study was carried out to elicit the effect of irrigation schedules and weed management practices on growth and yield of blackgram.

A field experiment was conducted during summer, 2001 at S.V.Agricultural College Farm, Tirupati on sandy loam soil with pH 7.6, low in organic carbon (0.22%) and available N (206 kg ha^{-1}) and medium in available P (20 kg ha^{-1}) and K (178 kg ha^{-1}). The experiment was laid out in split plot design replicated thrice with four irrigation schedules *viz*., I_1-irrigation at branching and pod development stages; I_2- irrigation at braching and flowering stages; I_3- irrigation at flowering and pod development stages and I_4- irrigation at branching, flowering and pod development stages as main plots and four weed management practices *viz*., W_1-weedy check; W_2-hand weeding at branching and flowering; W_3- pre emergence application of pendimethalin @ 1.5kg ai ha^{-1} and W_4- pre emergence application of metolachlor @ 1.5 kg ai ha^{-1} as sub plots. A pre sowing irrigation was given to all the treatments and the remaining irrigations were given as per treatment schedule. Measured quantity of irrigation water (5 cm) was delivered at each experimental plot by installing water meter at water outlet. The test variety LBG-20 was sown on 6-1-2001 @ 2 seeds $hill^{-1}$ at a spacing of 30 x 10 cm and harvesting was done on 18-3-2001. The other cultural practices were uniformaly applied to all the treatments.

Perusal of the data revealed the irrigations scheduled at branching, flowering and pod development stages recorded significantly taller plants (19.83 cm), higher dry matter production (2316 kg ha^{-1}) and more number of nodules $plant^{-1}$ (19.83). Improvement in these growth parameters can be attributed to optimum soil moisture available for crop growth throughout its life cycle. The superiority of irrigations scheduled at three growth stages was observed in number of pods $plant^{-1}$, number of seeds pod^{-1} and test weight compared to other irrigation schedules (Table. 1). With two irrigations, inadequate available soil moisture resulted in shorter plants and lower dry matter production leading to decreased yield attributes. Highest seed and haulm yield was with irrigations scheduled at branching, flowering and pod development stages and was signifcantly superior to other irrigation schedules. Three irrigations at different phenological growth stages would have resulted in increased fruiting capacity of the plant and setting sound seeds. These findings are in accordance with Pal and Jana (1991) and Sarkar (1992). The highest net returns and benefit cost ratio were observed with irrigations scheduled at branching, flowering and pod development stages.

The highest growth, yield attributes and yield of blackgram were recorded with hand weeding twice at branching and flowering, which was significanlty superior to rest of the weed management practices. This might be due to better weed control at critical growth stages of crop growth facilitating the crop to utilize abailable growth resoureces more efficiently. Jain et al. (1977) and Choubey et al. (1999) reported the similar findings. Hand weeding twice at branching and flowering registered highest net returns and benefit cost ratio.

With regards to interaction, irrigation scheduled at branching, flowering and pod development stages coupled with hand weeding twice at branching at flowering registered higher seed yield (Table 2) and were lowest with irrigation applied at branching and pod development stages along with weedy check. Thus the present study revealed that that irrigating blackgram at branching, flowering and pod development stages and hand weeding twice at branching and flowering resulted in higher growth, yield and net returns.

Table 1. Growth, Yield attributes and economics of blackgram as influenced by irrigation schedules and weed managment practices.

Treatment	Plant Height (cm)	Dry matter Production (kg ha^{-1})	No. of Nodules Plant^{-1}	No.of Pods Plant^{-1}	No.of Seeds Pod^{-1}	1000 Seed Wt. (g)	Haulm Yield (kg ha^{-1})	Net returns (Rs. ha^{-1})	Benefit Cost ratio
Iggiration schedules									
I_1	14.69	1960	12.83	11.63	4.37	32.18	892	4599	1.73
I_2	15.50	2020	19.25	12.46	5.10	35.99	904	8037	2.20
I_3	14.02	1616	12.83	9.29	4.29	32.59	698	955	1.13
I_4	16.81	2316	19.83	13.01	5.32	42.71	1048	9286	2.35
CD (P=0.05)	1.45	57	0.82	0.86	0.50	2.04	2	-	-
Weed Management Practices									
W_1	13.68	1453	14.67	9.38	4.69	34.93	755	3469	1.63
W_2	16.89	2390	18.08	13.08	4.80	36.77	1002	8388	2.23
W_3	15.60	2107	16.42	12.15	4.80	36.04	947	6206	1.83
W_4	14.85	1972	15.58	11.42	4.79	35.74	839	4813	1.73
CD (P=0.0.5)	1.20	56	0.51	0.80	NS	1.26	4	-	-

Table 2. Interactive effect of irrigation schedules and weed managment practices on seed yield of blackgram (kg ha^{-1})

Weed managment practices	Irrigation schedule				Mean
	I_1	I_2	I_3	I_4	
W_1	474	534	306	605	480
W_2	681	1000	483	1161	831
W_3	662	900	442	966	743
W_4	559	751	889	681	595
Mean	594	796	405	853	
CD (P=0.0.5)					
I	36		I at F		34
W	19		F at I		24

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