

Chemical and cultural methods for weed control of mung bean under limited moisture conditions of Kandi belt of Jammu

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ABSTRACT

An experiment was conducted during *kharif* season of 2006 and 2007 in Jammu to study the efficacy of pre and post emergence herbicides for controlling weeds of mung bean under limited moisture conditions of Kandi belt of Jammu. Hand weeding twice at 20 and 40 DAS produced the highest average seed yield (697.8kg/ha) which was at par with metolachlor (PE, 0.75kg/ha) *fb* one hand weeding at 20 DAS (691.6kg/ha). Among the other herbicidal treatments, pendimethalin (PE 1.0 kg/ha) *fb* 1HW at 30 DAS) was superior in controlling weeds and increasing the seed yield.

Key words : mung bean, Pre-emergence, Cultural practices, Kandi area, Chemical control.

Mung bean is the main *kharif* pulse crop grown in limited moisture conditions of Kandi belt of Jammu. The sowing of crop is done immediately after the onset of monsoon. Weed can cause 77-85% yield loss in the crop. The control of weeds during the critical period of crop-weed competition is very important to avoid yield losses. Selective herbicide may be one of the best alternatives for economic and timely weed control in moongbean. With this objective, bio-efficacy of different pre and post-emergence herbicides in comparison to hand weeding (HW) and hoeing was evaluated in mung bean.

The experiment was conducted at the Pulses Research Sub-Station, Samba of SKUAST-Jammu in the *kharif* seasons of 2006 and 2007. The soil of the experimental site was sandy loam in texture, low in organic carbon (0.42%), medium in available phosphorus (14 kg/ha) and low in potassium (182kg/ha) with a pH of 7.2. Nine treatments comprising weedy check, one HW at 20 DAS, HW twice at 20 and 40 DAS, pendimethalin 1.0 kg/ha PRE pendimethalin 1.0 kg/ha PRE *fb* one HW at 20 DAS, fluchloralin (PPI, 1.5 kg/ha), fluchloralin (PPI, 1.5 kg/ha) *fb* one HW 20 DAS, metolachlor (PRE, 0.75kg/ha) and metolachlor (PRE, 0.75kg/ha) *fb* one HW at 20 DAS were evaluated in RBD with three replications. The cultivar *SML-668* was sown on 9th July, 2006 in first year and on 18th July, 2007 in second year of experimentation at row spacing of 30 cm. Uniform doses of 20 kg nitrogen, 17 kg phosphorus and 16 kg potassium were applied to all the experimental plots at the time of sowing. Two quadrat of 1x1m were placed at randomly in each plot, weeds were removed and after drying in hot air oven (70 ± 1°C for 72 hrs), weed dry weight was recorded.

The predominant weed flora comprised of *Echinochloa colona* (80%), *Cynodon dactylon* (15%) and

Cyperus rotundus (5%) in monocots and *Commelina benghalensis* (75%) and *Ageratum conizoides* (15%) in dicot. All weed control treatments significantly lowered the weed population. Among different treatments, application of metolachlor (PRE, 0.75kg/ha) *fb* one HW at 20 DAS significantly controlled the weeds during both the years which was at par with two HW at 20 and 40 DAS, (Table 1). Balyan *et al.* (1988) also reported similar findings. All the weed control treatments significantly decreased the weed dry weight. Metolachlor application (PRE, 0.75kg/ha) *fb* one HW at 20 DAS showed significantly lower weed dry weight (4.2g/m²) which was at par with two HW (6.4g/m²) treatment. The maximum weed dry weight was recorded in weedy check (77.7g/m²) plots (Table 1).

The number of pods/plant were highest to the tune of 24.5 in 2006 and 23.5 in 2007 with the treatment metolachlor (PRE 0.75 kg/ha) *fb* one HW at 20 DAS which was at par with that of two HW at 20 and 40 DAS. Results were in close proximity to that as reported by Srinivasan *et al.* (1992). Highest average net returns (Rs 19545/ha) amongst the weed management treatments in mung bean during both the years was recorded with the application of metolachlor (PRE 0.75 kg/ha) *fb* one HW at 20 days after sowing (Table 2). It can be concluded that in mung bean, application of metolachlor (PRE, 0.75kg/ha) *fb* one HW 20 DAS proved superior to all other options and was followed by HW twice at 20 and 40 days after sowing.

REFERENCES

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Table 1. Effect of weed management treatments on number of pods per plant and weed parameters in mung bean.

Treatments	Weed population		Weed dry weight		Pods/plant		Weed control efficiency (%)	
	2006	2007	2006	2007	2006	2007	2006	2007
One HW at 20 DAS	5.2(26)	4.7(21)	3.2(9.1)	3.0(8.2)	22.3	24.7	66.7	69.8
HW twice at 20 and 40 DAS	3.6(12)	3.3(10)	2.7(6.4)	2.7(6.5)	23.4	25.7	80.0	81.5
Pendimethalin 1.0 kg/ha as PRE	8.9(78)	8.5(72)	5.8(32.4)	5.5(29.3)	12.7	14.5	25.7	26.8
Pendimethalin 1.0 kg/ha as PRE + one HW 20DAS	8.1(65)	8.3(68)	4.5(19.1)	4.9(22.5)	21.7	20.5	38.1	40.5
Fluchloralin (PPI,1.5 Kg/ha)	6.8(41)	7.0(48)	5.2(26.5)	5.5(29.0)	20.5	18.7	60.95	62.5
Fluchloralin (PPI,1.5 Kg/ha) /fb one HW 20 DAS	9.0(80)	8.5(72)	4.2(16.4)	4.4(18.4)	21.5	19.7	23.8	25.0
Metolachlor (PRE,0.75kg/ha)	8.5(71)	8.7(75)	3.7(12.5)	4.2(16.2)	22.6	23.7	32.5	25.2
Metolachlor (PRE,0.75kg/ha) /fb one HW 20 DAS	3.3(10)	3.0(8)	2.3(4.2)	2.1(3.5)	25.4	26.2	90.4	91.2
Weedy check	10.3(105)	9.9(98)	8.9(77.7)	8.4(68.9)	21.5	23.2	-	-
LSD (P=0.05)	2.5	1.8	1.3	1.0	N S	N S	-	-

Figures in parenthesis indicate the original values and are transformed by using $\sqrt{x+1}$ transformation.

Table 2. Seed yield and net returns as influenced by the weed control treatments in mung bean

Treatments	Seed yield (kg/ha)		Net return (Rs/ha)	
	2006	2007	2006	2007
One hand weeding at 20 DAS	533.5	543.2	14405	15753
Hand weeding twice at 20 and 40 DAS	695.9	699.8	18789	20294
Pendimethalin 1.0 kg/ha as pre-emergence	540.5	546.0	14594	15834
Pendimethalin 1.0 kg/ha as pre-emergence /fb one hand weeding 20 DAS	573.76	580.3	15492	16829
Fluchloralin (PPI,1.5 Kg/ha)	503.1	504.2	13584	14622
Fluchloralin (PPI,1.5 Kg/ha) /fb one hand weeding 20 DAS	566.0	570.5	15282	16545
Metolachlor (PE,0.75 kg/ha)	570.9	573.5	15414	16632
Metolachlor (PE,0.75 kg/ha) /fb one hand weeding 20 DAS	690.6	692.6	18646	20085
Weedy check	350.5	365.2	9464	10591
LSD (P=0.05)	87.7	88.8		

The sale rates of moongbean during 2006 and 2007 were Rs.27/kg and Rs.29/kg, respectively.