

INFLUENCE OF DIFFERENT WEED CONTROL TREATMENTS ON PRODUCTION OF MAIZE (ZEA MAYS L) INTERCROPPED WITH LEGUMES

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Abstract: Field experiments were conducted during *Kharif* season 2005-06 and 2006-07 at Department of Agronomy, college of Agriculture, VNMKV, Parbhani (MS). The research findings concluded that in sole maize significantly lowest weed density, total dry weed weight were observed while maize based intercropping systems significantly higher maize equivalent yield and monetary returns. Among weed control treatments, application of fluchloralin@1.35 kg/ha alone which was found to be at par with the fluchloralin@0.90 kg/ha followed by hand weeding at 6 weeks after sowing and recorded significantly lowest number of weeds with minimum dry weed weight and significantly highest weed control efficiency, maize grain yield, maize grain equivalent yield and monetary returns compared to rest of chemical and cultural weed control treatments and weedy check.

Keywords: Weed, maize, intercrop, equivalent yield.

Introduction: Sole cropping is unable to suppress the weeds as compared with intercropping system and provides an opportunity to utilize crop themselves as tools of weed management (Rao and Shetty, 1976). Maize based intercropping systems are often subjected to severe stress offered by weeds. Intercropping is not only a way to check the weed growth but also it offers the possibility of capturing a greater share of available resources than sole crop (Altieri and Liebman, 1986). Although intercropping is one of the options to control the weeds but it is not a way to fully depend on this in monsoon season. Comparing the effects of various intercrops in maize reported that growing one row of urdbean in between two rows of maize (60 cm spacing) gave an increase of about 40 per cent yield over the sole crop of maize. Although intercrops smother the weeds in a system, but studies on crop-weed association, critical-crop weed competition period, safer herbicides and integrated weed management practices need to be studied. Pulses being legumes, short duration and dwarf offer promise as intercrop in maize which is generally wide spaced cereal crop.

Combination of intercropping with differently applied herbicides i.e. pre-emergence and pre-plant incorporation herbicides, which are selective to maize and intercrops, can give better option. Hence experiment was conducted to investigate influence of different weed control treatments on production of maize (*Zea mays* L) intercropped with legumes.

Material and Methods: The field experiment was conducted for two years during *kharif* 2005-06 and 2006-07, respectively at College Farm, Department of Agronomy, V N Marathwada Agricultural University, Parbhani. Experimental soil was medium deep black and well drained. The soil was clayey in texture, low in available nitrogen and medium in available phosphorus, high in available potassium and slightly

alkaline in reaction.

The experiments were laid out in Split Plot Design with three replications. There were 21 treatment combinations of three cropping system and seven weed management treatments. The trials were conducted during *kharif* 2005 and 2006. Details of treatment A]

Main plot: Cropping systems (3) M₁ - Sole Maize M₂ - Maize + soybean, M₃ - Maize + blackgram Sub-plot Weed management (7) W₁ - Fluchloralin @ 1.35 kg/ha W₂ - Fluchloralin @ 0.90 kg/ha fb 1 HW & hoeing at 6 WAS, W₃ - Pendimethalin @ 1.00 kg/ha W₄ - Pendimethalin @ 0.75 kg/ha fb 1 HW & hoeing at 6 WAS, W₅ - Two hoeing and weeding at 3 & 6 WAS W₆ - Weed free check (weeding at 20 days interval) * W₇ - Unweeded check * In case of weed free weeding at 20 days interval was followed.

Results and Discussion

Effect on Weed control: Data presented in Table.1 shows that sole maize significantly lowest weed density, total dry weight, however maize+ soybean intercropping controlled weed flora efficiently to the tune of 81.39% as compared to sole maize. Use of fluchloralin @1.35 kg/ha alone which was found to be at par with the fluchloralin @0.90 kg/ha fb HW at 6 WAS and both these treatments recorded significantly lowest weed dry weight and highest weed control significantly in comparison to remaining treatments. Application of herbicides before sowing and before emergence suppressed the weed population very well than that of the traditional practices in combination with the herbicides. These results are in the conformity with those reported by Kolage *et al* (2004)

Effect on maize grain yield: Obviously sole maize yielded significantly higher grain yield (q/ha) than intercropped maize. Ennin *et al* (2001) observed that the competition between maize and intercrop begins

from 30 DAS and the time of cob emergence time it is at peak stage. Therefore, the sole better yielded than intercropped maize. If compared with black gram and soybean intercropped maize + blackgram intercropping was next best which was significantly superior over maize yield in maize + soybean intercropping system. As blackgram is short durational crop than soybean hence there is less competition with black gram (Willey, 1979).

Fluchloralin @0.90 kg/ha fb 1HW at 6 WAS which was found to be at par with fluchloralin @1.35 kg/ha and noticed to be significantly higher maize grain yield than rest of the weed control treatments. As concern to traditional weed control treatments yielded significantly higher maize yield than weedy check because of longer durational weed control (after 6 WAS) in weed free treatment did not give additional production. If we are able to control the weeds during the critical period it is almost equal to the full season weed free situation.

Effect on Intercrop yield: On two years pooled data basis soybean recorded 7.51 q/ha and black gram 3.57 q/ha during the experiment duration.

Application of fluchloralin @0.90 kg/ha fb 1HW at 6 WAS which was found to be at par with fluchloralin

@1.35 kg/ha and noticed to be significantly higher soybean and black gram yield than rest of the weed control treatments. Use of pre-plant incorporation fluchloralin and pre-emergence pendimethalin herbicides found to be useful in reduction of the weed density and weed dry matter in both soybean and blackgram. Now a days focus is on integrated weed management system is also found to be better for soybean and blackgram crop instead of any single method. Same type of results were reported by Shewta and Singh (2005).

Maize grain equivalent yield and Monetary returns: Data presented in Table.1 clear that maize + soybean was at par with maize + blackgram and recorded significantly highest maize grain equivalent yield and net monetary returns than sole maize. Such increase in yield due to additional yield of intercrop. Obviously sole maize recorded significantly lowest yield and monetary returns.

Fluchloralin @0.90 kg/ha fb 1HW at 6 WAS which was found to be at par with fluchloralin @1.35 kg/ha and noticed to be significantly higher maize grain equivalent yield and net monetary returns than traditional weed control and weedy check.

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Table. 1 Weed Density, Total dry weed weight, Weed control efficiency, Maize, Intercrop and Maize equivalent yields, Net monetary returns (Pooled mean

Treatments	Weed density				Maize grain yield		Intercrop yield two years average (q/ha)		Maize grain equivalent yield (q/ha)	Net monetary returns (Rs./ha)
	Monocot	Dicot	Total weed dry wt.(g/m ²)40 DAS	Weed Control Effici.(%)	2005-06	2006-07	Soy.	Black gram		
Cropping system										
M1-Sole maize	24.68	12.29	21.39	44.87	72.84	76.21	-----	-----	74.52	31874
M2 Maize + Soybean	8.58	4.65	7.27	81.39	62.77	66.84	7.65	-----	85.35	35219
M3-Maize + Blackgram	12.34	6.78	11.36	70.86	68.02	71.44	-----	3.71	85.19	35924
M3-Maize + Blackgram	0.80	0.34	0.71	--	1.05	1.39	----	----	1.04	664.91
SE \pm CD at 5 %	2.37	1.02	2.05	--	3.18	4.15	-----	-----	3.28	1958.4
Weed management										
W1- Fluchoralin@1.35 kg /ha	4.42	2.49	3.51	90.96	79.83	84.63	9.20	4.20	96.27	44440
W2-Fluchloralin@0.90 kg/ha fb 1 HW & H at 6 WAS	5.96	2.87	4.63	88.11	82.03	85.84	9.52	4.30	98.40	45290
W2-Fluchloralin@0.90 kg/ha fb 1 HW & H at 6 WAS	9.55	5.13	8.29	78.66	71.05	75.50	7.99	3.72	85.57	37550
W3- Pendimethalin@ 1.00 kg /ha	10.59	5.58	9.05	76.70	74.49	78.83	8.39	3.84	89.48	39430
W4- Pendimethalin @0.75 kg /ha fb 1 HW at H at 6 WAS	15.89	8.25	15.17	61.03	66.33	68.41	7.19	3.50	78.66	31801
W5- 2 H + 2 HW at 3 & 6 WAS	14.50	8.15	13.89	64.28	68.84	71.06	7.58	3.63	81.76	30532
W6- Weed free	45.46	22.89	38.91	--	32.58	36.24	3.73	2.83	41.66	11368
W7-Weedy Check	1.28	0.74	1.13	---	1.35	1.98	-----	-----	1.52	1448.66
SE \pm CD at 5 %	3.84	2.13	3.20	---	4.02	6.01	-----	-----	5.61	4248.81
Interaction (M x W) SE \pm CD at 5 %	2.53 N.S.	1.34 N.S.	1.99 N.S.	---	2.01 N.S.	2.76 N.S.	-----	-----	2.55 N.S.	2538.89 N.S.
General Mean	15.19	7.91	13.35	65.68	67.88	71.50	7.65	3.71	81.69	34339