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Effect of Intercropping and Weed Management Practices on Weeds in Maize

T. Selvakumar and A. Sundari
Department of Agronomy
Annamalai University, Annamalainagar-608 002 (Tamil Nadu), India

Maize is one of the most important cereal crops cultivated in an area of 6.56 million hectares with a production of 12.0 million tonnes in India. Now-a-days, intercropping is common in intensive agriculture. Although intercropping is practised to maximize land use, it also has significant effect in suppressing weed growth (Rao, 2000). But intercropping system alone is not sufficient to ensure adequate weed management practices, because of varied canopy coverage occurred by intercrop. Labour is becoming a scarce and costly input in Indian agriculture. This has resulted in increased technical grade herbicide consumption. Hence, the present thrust in weed research is to reduce the herbicide use and to formulate integrated management practices by combining non-chemical methods, which are efficient, economical and ecofriendly. Based on this background, the field study was programmed.

Field experiment was conducted at Annamalai University Experimental Farm during summer and **kharif** 2002. The soil of the experimental field was clay loam, low in available N, medium in available P and high in available K with pH 7.7. The experiment was laid out in spilt-plot design with three replications. The main plot consisted of intercropping system and the sub-plots consisted of weed management practices (Table 1). The herbicides were applied with a manually operated knapsack sprayer fitted with flood jet nozzle at spray volume of 500 l ha^{-1} on 3 DAS. Density and biomass of weeds were recorded at 30 and 60 DAS with the help of 25 cm x 25 cm quadrate by throwing it randomly at four places from each plot.

Experimental field was infested with *Trianthema portulacastrum* Linn. (54.3%), *Cyperus rotundus* L. (40.7%), *Cynodon dactylon* (L.) Pers. (3.2%) and *Phyllanthus niruri* L. (1.8%). Among the weeds, *C. dactylon* and *P. niruri* occurred in lesser proportion and not significantly influenced by treatments. *T. portulacastrum* and *C. rotundus* were predominantly and significantly altered by weed control treatments.

Maize+cowpea intercropping system recorded the highest WCE of 90.6% at 60 DAS. It was followed by maize+blackgram intercropping system. The highest yield advantages viz., maize equivalent yield (MEY) of 5284 kg ha^{-1} and income equivalent ratio (IER) of 1.44 were recorded in maize+ cowpea intercropping compared to maize+ blackgram and maize alone. Among the weed management practices, pre-emergence application of pendimethalin+one HW recorded the highest WCE of 97.9% and MEY of 5856 kg ha^{-1}.

REFERENCE

Rao, V. S. 2000. *Principles of Weed Science*. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi. pp. 5 & 12.

Table 1. Influence of intercropping and weed management practices on weeds and crop (Mean of two seasons)

Treatment	Total weed density on 60 DAS	Total weed dry matter on 60 DAS ($g\ m^{-2}$)	WCE (%)	Grain yield ($kg\ ha^{-1}$)			MEY ($kg\ ha^{-1}$)	IER
				Maize	Blackgram	Cowpea		
Cropping systems								
Sole maize	8.89 (90.23)	49.19	88.5	3692	-	-	3692	-
Maize+blackgram	7.61 (69.80)	39.62	89.9	3974	347	-	4956	1.34
Maize+cowpea	6.84 (59.17)	35.44	90.0	4274	-	404	5284	1.44
LSD (P=0.05)	0.24	0.97	-	116	-	-	-	-
Weed management practices								
Weedy check	13.63 (189.07)	164.56	-	2501	201	262	2909	1.47
Twice hand weeding	4.45 (20.20)	4.11	97.6	4885	425	485	5690	1.35
Alachlor 2.0 $kg\ ha^{-1}$	10.55 (111.23)	39.70	75.7	3304	277	325	3837	1.42
Pendimethalin 1.0 $kg\ ha^{-1}$	8.75 (76.67)	30.19	81.0	3775	338	390	4419	1.40
Alachlor+one HW at 30 DAS	5.00 (25.33)	6.31	96.0	4429	381	437	5153	1.36
Pendimethalin+one HW at 30 DAS	4.31 (18.90)	3.64	97.8	4984	461	525	5856	1.36
LSD (P=0.05)	0.37	1.05	-	0170	-	-	-	-

Market price of maize=Rs. 6.00 kg^{-1}, blackgram=Rs.17 .00 kg^{-1}, cowpea=Rs.15.00 kg^{-1}.
Figures in parentheses indicate original values.