Indian J. Weed Sci. **36** (3 & 4) : 308-309 (2004) *Short Communication*

Economics of Integrated Weed Management Practices in Sunflower Based Intercropping System

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Now-a-days intercropping is common in intensive agriculture. Although intercropping is practised to maximize land use, it has also a significant effect in suppressing weed growth. Less weed infestation was recorded in an intercropping system than in monoculture system (Rao, 2000). But intercropping system alone is not sufficient to ensure adequate weed management practices because of varied canopy coverage prevailing in intercrops. Therefore, efforts are needed to develop suitable integrated weed management techniques in sunflower based intercropping system wherever irrigation facilities exist.

Field experiments were conducted at Annamalai University Experimental Farm during summer and **kharif** 2003. The soil of the experimental field was clayey loam in texture.The nutrient status of the experimental soil was low in nitrogen, medium in phosphorus and high in potassium with pH of 7.4. The experiments were laid out in split-plot design with three cropping systems [sole sunflower, sunflower+blackgram (1 : 1) and sunflower+sesame (1 : 1)] in main plots and four weed control measures (unweeded control, hand weeding twice at 20 and 40 DAS, fluchloralin 1 kg ha^{-1} and fluchloralin 1 kg ha^{-1}+one hand weeding at 30 DAS) in sub-plots with three replications. Sunflower hybrids Bioseeds-5468, blackgram ADT-3 and sesame TMV-3 were used as main plot treatments, respectively. The crops were sown as per treatments on specified spacing under the recommended package of practices. The herbicide fluchloralin 1 kg ha^{-1} was applied three days before sowing. Immediately after spraying, the herbicide was incorporated into the soil with the help of light irrigation. A knapsack hydraulic sprayer fitted with deflector nozzle was used for spraying the herbicides using a spray volume of 500 l ha^{-1}.

The experimental field was infested mainly with *Cyperus rotundus* (44%), *Trianthema portulacastrum* (36%), *Phyllanthus niruri* (9%) and *Echinochloa colonum* (27%) (Table 1).

Table 1. Influence of intercropping and weed management practices on sunflower yield, intercrop yield, sunflower equivalent yield, net income and B : C ratio (Mean of two seasons)

Treatment	Sunflower yield (kg ha^{-1})	Intercrop yield (kg ha^{-1})		Sunflower equivalent yield (kg ha^{-1})	Net income (kg ha^{-1})	B : C ratio
		Blackgram	Gingelly			
Cropping systems						
Sole sunflower	1169	-	-	1169	7975	1.70
Sunflower+blackgram (1:1)	1485	332	-	1941	19368	2.60
Sunflower+sesame (1:1)	1377	-	170	1653	15634	2.35
LSD (P=0.05)	78.52	-	-	-	-	-
Weed management practices						
Unweeded control	860	210	110	1016	7190	1.76
Hand weeding twice	1560	392	213	1855	17715	2.37
Fluchloralin 1 kg ha^{-1}	1355	305	135	1568	13874	2.22
Fluchloralin 1 kg ha^{-1}+1 HW	1598	423	220	1911	18524	2.50
LSD (P=0.05)	90.46	-	-	-	-	-

HW–Hand weeding.

Sunflower+blackgram cropping system followed by fluchloralin+one hand weeding produced the highest seed yield of sunflower. The increased seed yield was due to weed suppression by intercrops by covering the land surface and less weed biomass and higher WCE and WSE. This in turn increased the growth and yield attributes of sunflower. This is in conformity with the findings of Yogeswara Rao *et al.* (1973).

The blackgram and sesame intercropping with sunflower gave the highest sunflower equivalent yield than sole sunflower because of higher market price rate of blackgram and sesame. Chemical weed management resulted in the highest sunflower equivalent yield than other treatments.

Economics of different intercropping systems under study have been assessed with the help of expenditure incurred on cultivation ha^{-1}. The highest net income and B : C ratio were obtained from the sunflower+blackgram intercropping system with fluchloralin 1 kg ha^{-1}+one hand weeding at 30 DAS.

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