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Integrated Weed Management in Brinjal (*Solanum melongena* L.)

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Eggplant (*Solanum melongena* L.) is one of the largely consumed principal vegetable crops grown in all parts of India. Since brinjal is a common vegetable, the demand for brinjal as a source of vegetable is increasing with increasing population. Therefore, there is a need to explore the possibilities for increasing the productivity through better understanding of the constraints on the production. Among the various production problems associated with brinjal, weed menace is one the major problems. Brinjal faces severe weed competition due to slow initial growth and wider spacing. Leela (1982) reported that 45% annual loss in brinjal would be due to weed menace. The integrated weed management system is basically an integration of effective, dependable and workable weed management practices that can be used economically by the farmers as a part of sound farm management system. Hence, the present study on integrated weed management in brinjal was taken up with the cultivar Annamalai.

A field experiment was conducted in the Department of Horticulture, Faculty of Agriculture, Annamalai University, Annamalainagar during December 2003 in a split plot design with three replications using cultivar Annamalai. The experiment consisted of four main plot treatments viz., glyphosate spray twice at 18 days interval @ 1.0 kg ha^{-1}, summer ploughing twice at 15 days interval, black polythene sheet mulching (300 gauge) and fallow and six sub-plot treatments viz., unweeded control, two hand weedings at 30 and 60 DAT, pendimethalin @ 1.5 kg ha^{-1} as pre-emergence+one hand weeding at 30 DAT, fluchloralin @ 1.5 kg ha^{-1} as pre-planting incorporation+one hand weeding at 30 DAT, pendimethalin @ 1.5 kg ha^{-1}+sugarcane trash mulching @ 12 t ha^{-1} and fluchloralin @ 1.5 kg ha^{-1}+sugarcane trash mulching @ 12 t ha^{-1}. Flat beds of 4 x 3 m were prepared and transplanting of the brinjal seedlings was done with a spacing of 75 x 60 cm. The herbicide and mulching treatments were followed as per the schedule. Necessary plant protection measures were adopted during the experimentation and field was irrigated as and when required. The weed species found in the experimental field were *Cyperus rotundus* Linn., *Trianthema portulacastrum* Linn., *Echinochloa crusgalli* (L.) Beauv. and *Cynodon dactylon* Pers. Weed count and weed dry matter production were recorded on 120 DAT. Weed control index was worked out as suggested by Misra and Tosh (1979).

All the weed control treatments increased the plant growth characters as compared to weedy check (Table 1). Among the off-season land management practices, black polythene sheet mulching recorded the least weed dry matter production (378.56 kg ha^{-1}), higher weed control index (42.04%), higher number of flowers $plant^{-1}$ (53.57) and fruit yield $plant^{-1}$ (0.69 kg), while the fallow recorded the highest weed dry matter production (1022.57 kg ha^{-1}), the least weed control index (29.06%), the highest number of flowers $plant^{-1}$ (32.54) and fruit yield (0.36 kg $plan^{-1}$) as compared with other treatments. In respect of sub-plot treatments, fluchloralin 1.5 kg ha^{-1}+ sugarcane trash mulching at 18 DAT recorded the least weed dry matter production (564.88 kg ha^{-1}), higher weed control index (40.57%) on 120 DAT, higher number of flowers $plant^{-1}$ (49.23) and the highest fruit yield (0.73 g $plant^{-1}$). The least growth characters were recorded by unweeded control treatments. The interaction effects were also found to be significant.

The integrated weed management treatments viz., black polythene sheet mulching followed by fluchloralin 1.5 kg ha^{-1}+ sugarcane trash mulching at 18 DAT favoured the growth and yield of brinjal

cv. Annamalai. The best performance of this treatment combination may be due to the integration of direct killing of weed seeds by black polythene sheet heat generation and indirectly killing through sub lethal heating and killing of germinating seeds whose dormancy is broken in the heated soil and also the herbicide application and sugarcane trash mulching which collectively reduced the crop-weed competition and conserved the soil nutrient status which ultimately favoured the better growth and yield performance of the crop. The results are in line with the findings of Sandhu *et al.* (1998).

Table 1. Effect of off and on season weed management treatments on weed dry matter production, weed control index, number of flowers plant^{-1} and yield plant^{-1}

Treatment	Weed dry matter production (kg ha^{-1})	Weed control index (%)	No. of flowers plant^{-1}	Yield plant^{-1} (kg)
Glyphosate 1 kg ha^{-1}	577.20	37.09 (36.55)	43.40	0.56
Summer ploughing twice	782.59	34.66 (33.14)	34.54	0.45
Black polythene sheet mulching	378.56	42.04 (44.91)	53.57	0.69
Fallow	1022.57	29.06 (23.70)	31.54	0.36
LSD (P=0.05)	2.88	1.36	0.25	0.03
Control	903.69	-	32.06	0.34
Two hand weedings	589.85	38.73 (39.75)	45.54	0.61
Pendimethalin @ 1.5 kg ha^{-1}	715.71	30.61 (26.12)	36.48	0.40
Fluchloralin @ 1.5 kg ha^{-1}	636.03	35.98 (35.19)	42.00	0.54
Pendimethalin @ 1.5 kg ha^{-1}+ sugarcane trash mulching	686.32	32.68 (29.41)	39.26	0.47
Fluchloralin @ 1.5 kg ha^{-1}+ sugarcane trash mulching	564.88	40.57 (42.89)	49.23	0.73
LSD (P=0.05)	3.45	1.27	2.27	0.02

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