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Integrated weed management in *kharif* groundnut (*Arachis hypogaea* L.)

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ABSTRACT
A field experiment was conducted during the rainy (*kharif*) season of 2000-01 on integrated weed management in groundnut (*Arachis hypogaea* L.) on clay loam soils of Rahuri, Maharashtra. Weed density and weed dry matter was significantly less in weed free check. Pre-emergence application of oxyfluorfen @ 0.125 kg a. i. ha^{-1} with hand weeding 30 DAS or glyphosate (POE) @ 1.5 kg a. i. ha^{-1}, soil solarization for 30 days and oxyfluorfen (PE) @ 0.25 kg a. i. ha^{-1} effectively controlled dry matter accumulation in weed. Maximum values of shelling per cent, 100 kernel weight and yield were recorded in weed free check followed by two hand weedings, oxyfluorfen (PE) @ 0.125 kg a. i. ha^{-1} + glyphosate (POE) @ 1.5 kg a. i. ha^{-1} and oxyfluorfen (PE) @ 0.125 kg a. i. ha^{-1} + 1 HW 30 DAS, maximum net returns and B:C ratio were observed under weed free treatment (Rs. 14,766/- ha^{-1} & 2.8 respectively followed by two hand weedings, oxyflorfen (PE) @ 0.125 kg a. i. ha^{-1} + HW 30 DAS and oxyfluorfen (PE) @ 0.125 kg a. i. ha^{-1} + Glyphosate (POE) @ 1.5 kg ha^{-1}.

Key words : Groundnut, Weed biomass, Herbicide, Weed management, Yield, Economics.

INTRODUCTION

Groundnut is extensively grown in India during the *kharif* season. Initial slow growth combined with prostate nature of its growth and hot humid climate prevailing during the *kharif* season permit early and severe crop weed competition resulting in loss of yield to the tune of 75 per cent (Gnanamurthy and Balsubramanian, 1998). Chemical control of weeds form an excellent alternative to manual weeding. However, pre-emergence application of herbicides may allow the emergence of weeds after some time. Under such situation integration of pre-emergence herbicidal treatments with hand weeding or post-emergence herbicides may help in reducing the losses caused by weeds. Weed control can also be achieved by mulching moistened soil with transparent polyethylene sheet during hot season. This technique of soil solarization in India was reviewed by Yaduraju (1993). The present study was, therefore, initiated to find out an effective and economical weed control method in groundnut.

MATERIALS AND METHODS

A field experiment was conducted in clay loam soil during *kharif* 2000 at Post Graduate Institute Research Farm, Rahuri, Maharashtra. The soil was slightly alkaline in reaction (pH 7.8), containing 113.82, 15.18 and 421.70 kg ha^{-1} available nitrogen, phosphorus and potassium, respectively. The experiment comprised 10 treatments, the details of which are furnished in Table 1. The experiment was laid out in randomized block design and replicated three times. The groundnut variety SB-XI was sown as 30 x 10 cm apart during first week of July. A basal dose of 25 kg N and 50 kg P_2O_5 ha^{-1} was applied through urea and single super phosphate, respectively. All the recommended package of practices were followed to raise the crops.

For soil solarization, in summer months, the plots were covered with transparent polyethylene sheet (0.014 mm) for 30 days following the procedure of Chauhan *et al.* (1988). All such plots were uniformly irrigated to field capacity, one day prior to imposing the treatments. Fifteen days prior to sowing of groundnut, the finally prepared plot was uniformly irrigated to field capacity. A flush of young weed seedlings appeared was removed by harrowing in state bed technique.

Weed samples were collected 1 m^2 quadrate at harvest for weed dry matter. The weed index (WI) and weed control efficiency (WCE) were computed as per Somani (1992).

RESULTS AND DISCUSSION

Weed density and weed dry matter

The predominant weed species observed were *Cyperus rotundus, Panicum ischmi, Cyanotis auxillaris, Cynodon dactylon, Commelina benghalensis* among monocots and *Digera arvensis, Parthenium hysterophorus, Acalypha indica* L., *Phyllanthus niruri, Lactuca runcinata, Euphorbia geniculata, Portulaca oleracea, Tridex procumbens* among the dicot weeds.

All the weed control treatments effectively controlled the weeds. Significantly lower weed density and weed dry matter and significantly more weed control efficiency was observed in all weed control treatments over the unweeded control. The weed density was significantly lowest in weed free treatment and was at par with 2 hand weedings and pre-emergence application of oxyfluorfen @ 0.125 kg a. i. + glyphosate (POE) @ 1.5 kg a. i. ha^{-1}. The highest weed weight (17.13 q ha^{-1}) was recorded in unweeded control (T_{10}). Weed free check recorded significantly lowest weed weight. It was followed by pre-emergence application of oxyfluorfen @ 0.125 kg a. i. ha^{-1} + glyphosate (POE) @ 1.5 kg a. i. ha^{-1}, oxyfluorfen (PE) @ 0.125 kg a. i. ha^{-1} + 1 HW at 30 DAS, soil solarization for 30 days and early post application of oxyfluorfen @ 0.25 kg a. i. ha^{-1} which were at par with each other. The results are in confirmity with the reports of Patel *et al.* (1996) and Biradar *et al.* (1997). The weed index was the maximum with unweeded control compared with other treatments (Table 1). Under the present investigation, effectiveness of herbicidal application in reducing weed competition upto early crop-growth stage

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