

Effect of weed control on nutrient uptake, weed weight and yield of groundnut

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ABSTRACT

A field experiment conducted at Post Graduate Institute Research Farm, MPKV., Rahuri, Ahmednagar (M. S.) during the rainy season of 2000, revealed that the weed free condition throughout the crop growth period in groundnut (*Arachis hypogaea* L.) drastically reduced with dry matter, N, P and K uptake by weeds and increased the pod yield, N, P and K uptake by groundnut crop. Application of oxyfluorfen @ 0.125 kg a. i. ha⁻¹ + glyphosate @ 1.5 kg ha⁻¹, oxyfluorfen @ 0.125 kg a. i. ha⁻¹ + hand weeding 30 DAS and two hand weedings (20 and 40 DAS) were next to weed free in giving higher pod yield and nutrient uptake by crop and were at par.

Key words : Groundnut, Weed control, Herbicides, Soil solarization, Nutrient uptake, Weed dry matter.

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is an important oilseed crop of India. The productivity of groundnut during rainy season is not stable due to various reasons. Among them weed infestation is considered to be one of the problems. Yield loss due to weed infestation amounts to 75 per cent (Gnanamurthy and Balasubramanian, 1998). Weeds not only compete with crop for resources like soil moisture, nutrients, light and space but also interfere with pegging, pod development and harvesting of groundnut. The critical period of weed competition was found to be first three to four weeks of crop growth (Kalaiselvan *et al.* 1991). Cultural method of weed control is a common practice followed in groundnut. These practices are time consuming, expensive and tedious. Under such situation use of herbicides is the only choice available for weed control. Reduced rates of herbicides in combination with inter-row cultivation or post emergence herbicides may also offer a viable alternative. The present investigation was therefore undertaken to find out an efficient weed management system in groundnut for increasing the productivity of this crop.

MATERIALS AND METHODS

The experiment comprised of 10 treatments, the details of which are furnished in Table 1. The experiment was laid out in randomised block design with three replications at Post Graduate Institute Research Farm, Rahuri (19° 48' N latitude and 74° 19' E longitude) during *kharif* season of 2000. The soil was clay loam containing 113.82, 15.18 and 421.70 kg ha⁻¹ available nitrogen, phosphorus and potassium, respectively. Groundnut variety SB-XI was dibbled on 3.7.2000 at spacing of 30 x 10 cm. A uniform dose of 25 kg N + 50 kg P₂O₅ ha⁻¹ was applied as basal application. Crop was harvested on 18.10.2000. Pre-emergence application of oxyfluorfen was made one day after sowing and post emergence application of oxyfluorfen and glyphosate was made 20 days after sowing. 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.

RESULTS AND DISCUSSION

Weed dry weight

The data on weed dry weight, pod yield and nutrient uptake by crop and weeds are presented in Table 1. The highest weed weight (17.13 q/ha⁻¹) was recorded in unweeded control (T₁₀). 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 (DOE) @ 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.

Nutrient uptake by weeds and crop

Nutrient removal by weeds was maximum in unweeded control (16.45, 3.09 and 3.97 kg, N, P and K ha⁻¹, respectively) in which crop uptake was minimum (45.81, 17.40 and 9.94 kg N, P and K ha⁻¹). This may be due to higher weed density and weed dry matter. Weeds which competed with crop for various growth resources depleted greater amounts of nutrients and thus deprived the crop of nutrients. Sounder Rajan *et al.* (1985) also reported that nutrient removal by weeds was maximum in unweeded control, in which crop uptake was minimum. The maximum nutrient uptake by crop was observed in weed free check (90.82, 34.35 and 20.07 kg N, P and K ha⁻¹) followed by T₅, T₈ and T₃ which were at par with it for N and P uptake. This may be due to lower weed population and weed weight which led to lower uptake of nutrients by weeds thus resulting in higher pod yields. Pannu *et al.* (1989) reported that uptake of N, P and K by crop was dependent mainly on the dry matter accumulation by weeds.

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