



INFLUENCE OF DIFFERENT HERBICIDES FOR WEED MANAGEMENT IN GROUNDNUT

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Abstract

It is imperative to develop cheaper methods of weed control with effective herbicides alone or mixed with other herbicides compared to integrated weed management that helps in reducing the weed population without much adverse effect on the crop productivity in groundnut. The field experiment was conducted during Kharif 2017 at farmer's field of Echanampatti village of palacode taluk, Dharmapuri district of Tamil nadu. Results of the experiment showed that pre emergence application of pendimethalin @ 1.0 kg a.i ha⁻¹ at 3 DAS + EPOE of sodium acifluorfen + clodinofof propergyl @ 900 g ha⁻¹ at 25 DAS gave higher yield (2590 kg ha⁻¹) and maximum net return on invested rupee (2.72) which was found to be more economically feasible weed management practice for groundnut.

Key words : Groundnut, Herbicides, Economics, Yield.

Introduction

Groundnut (*Arachis hypogaea* L.) is one of the most important oilseeds crop in India. It contributes more than 50 % of the edible oil production in our country. The demand for edible oil is rising day by day. Area as well as productivity of groundnut is declined drastically. Therefore concentrated efforts are being made to increase and to stabilize the oilseeds production. The yield of groundnut crop depends upon various agronomic management practices and there are several reasons for low productivity. One of the major factors responsible for low productivity of groundnut is weed infestation. As groundnut is grown mainly during *Kharif* when there is more favourable for weed growth, which encourages repeated flushes of grasses and broad leaved weeds during the entire season for competition with the crop, specially during early stages of crop growth. Jat *et al.* (2011) stated that the critical period of weed competition is found to be the first four to eight weeks after sowing. Weeds reduce yields by competing with the crop for sunlight, space, moisture and nutrients not only throughout the growing season, but also create problem during digging and inverting procedures and reduce harvesting efficiency.

Harvesting losses increases the biomass of weeds. Weeds have allelopathic effect with groundnut and they act as host for causal organisms of various diseases and insect pests at the time of Kharif season, effective and economical weed control is not possible through manual and mechanical weeding due to unfavourable soil condition and also the unavailability of laborers. The alternative way to use of herbicides for weed management, there are number of pre emergence herbicides like pendimethalin, fluchloralin etc. are used for weed control in groundnut. However, they often fail to control weeds emerging during early vegetative phase of the crop. Therefore, the present study was undertaken to identify the suitable early post emergence herbicides for weed management in groundnut.

Materials and Methods

With a view to determine the Influence of different herbicides for weed management in groundnut, the present study was carried out during Kharif season of 2017 at farmer's field of Echanampatti village of palacode taluk, Dharmapuri district of Tamil Nadu, India. The soil was clay loam in texture with pH of 7.8, available N (70 kg ha⁻¹), P₂O₅ (20 kg ha⁻¹) and K₂O (130 kg ha⁻¹). The experiment was laid out in randomized block designs with

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Table 1 : Effect of weed management practices on yield and economics of irrigated groundnut.

| T.No. | Pod yield (kg ha ⁻¹) | Haulm yield (kg ha ⁻¹) | Harvest index (%) | Benefit cost ratio(BCR) |
|---------------------|----------------------------------|------------------------------------|-------------------|-------------------------|
| T ₁ | 2361 | 3949 | 49.38 | 2.57 |
| T ₂ | 2215 | 3754 | 47.42 | 2.31 |
| T ₃ | 1815 | 2909 | 41.34 | 1.96 |
| T ₄ | 1854 | 2964 | 42.04 | 2.05 |
| T ₅ | 2005 | 3167 | 44.32 | 2.06 |
| T ₆ | 2173 | 3690 | 46.91 | 2.29 |
| T ₇ | 2590 | 4176 | 52.43 | 2.72 |
| T ₈ | 2410 | 4017 | 49.93 | 2.60 |
| T ₉ | 2645 | 4250 | 53.05 | 2.69 |
| T ₁₀ | 1012 | 2500 | 23.87 | 1.21 |
| SE _d | 62.40 | 63.95 | 1.10 | - |
| CD _(0.5) | 131.10 | 134.36 | 1.95 | - |

ten treatments and replicated thrice. The treatments includes T₁ – pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb post emergence application of quizalofop ethyl 100 g ha⁻¹, T₂- pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb hand weeding on 45 DAS, T₃- EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ at 15 DAS, T₄- EPOE quizalofop ethyl + imazethapyr 100 g ha⁻¹ at 15 DAS, T₅- EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ at 15 DAS fb hand weeding on 45 DAS, T₆- EPOE quizalofop ethyl + imazethapyr 100 g ha⁻¹ at 15 DAS fb hand weeding on 45 DAS, T₇- pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ at 25 DAS, T₈- pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE quizalofop ethyl + imazethapyr 100 g ha⁻¹ at 25 DAS, T₉-Two hand weedings (20 and 40 DAS) and T₁₀- Unweeded control.

The *kharif* groundnut variety TMV-7 was sown manually at a spacing of 30 × 10 cm with 120 kg ha⁻¹ of seed rate during first week of July 2017. The experimental field was irrigated immediately after sowing. Life irrigation was given three days after sowing and subsequent irrigations were given as and when required. Weeding was done as per the treatment schedule. A fertilizer schedule of 17: 34: 54 kg NPK ha⁻¹ in the form of urea, SSP and MOP, respectively were applied to all plots uniformly in lines and incorporated at the time of sowing. The entire dose of NPK was applied at basal. Gypsum @ 400 kg ha⁻¹ was applied during earthing up at 45 DAS. The observations are taken at 30 and 60 DAS and at maturity.

Results and Discussion

The findings of the present study as well as relevant discussion have been presented under following heads :

Effect on yield parameters

Pod yield (kg ha⁻¹)

Significantly higher pod yield was recorded under hand weeding. Whereas, unweeded control recorded the lower pod yield in groundnut. The higher pod yield (2645 kg ha⁻¹) was recorded under the treatment (T₉) hand weeding twice at 20 and 40 DAS which was 61.73% higher than unweeded control and it was on par to that obtained in the treatment T₇-pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ (2590 kg ha⁻¹). These two treatments were superior over rest of the other treatments. Herbicide application reduces the weed population at early stages of crop growth, which permitted better growth of crop, peg initiation and development at the critical growth stages of groundnut, leading to synergistic effect on yield attributes reported by Mulik *et al.* (2010) and Wani *et al.* (2010). The lower pod yield (1012 kg ha⁻¹) was obtained under unweeded control (table 1).

Haulm yield (kg ha⁻¹)

Weed management practices are significantly influenced the haulm yield of groundnut. Significantly higher haulm yield was recorded under T₉ - hand weeding twice at 20 and 40 DAS (4250 kg ha⁻¹), it was on par with T₇- pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ (4176 kg ha⁻¹). The lower haulm yield (2500 kg ha⁻¹) was obtained under unweeded control (T₁₀).

Harvest index (%)

The harvest index was maximum under T₉ - hand weeding twice at 20 and 40 DAS (53.05 per cent), which were on par with T₇- pre emergence application of

pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ (52.43 per cent). Unweeded control (T₁₀) registered minimum harvest index (23.87 per cent).

Effect of weed management practices on economics of groundnut

Pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ was most effective in controlling weeds with higher net returns (Rs. 83354 ha⁻¹) and benefit cost ratio (2.72). This might be due to effective control of weeds and less cost of cultivation (Sagvekar *et al.*, 2015). This cost was reduced in pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ by using herbicides for effective control of weeds with minimizing human laborers.

Conclusion

From the above results, it can be concluded that pre emergence application of pendimethalin 1.0 kg ha⁻¹ at 3 DAS fb EPOE of sodium acifluorfen + clodinofof propergyl 900 g ha⁻¹ at 25 DAS was practically more

convenient, efficient and economically feasible weed management practice for groundnut.

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