

Efficient weed management through appropriate herbicides in groundnut

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In groundnut cultivation, several factors cause yield losses, weeds contribute about 40% in yield reduction. Krishi Vigyan Kendra Chhatarpur initiated a systematic and comprehensive effort to solve the most severe weed problem in groundnut cultivation through appropriate weed management. Application of appropriate herbicides i.e. Imazethapyr 10% SL @ 100 g a.i./ha + Quizalofop-ethyl 5% EC @ 37.5 g a.i./ha at 15-20 days after sowing along with use of appropriate nozzle and volume of solution. By adopting appropriate herbicide for weed management practices, farmers received higher yield (6.7q/ha) that fetched higher income (₹ 32,243/ha) due to reduction of weed density (93.6%) as compared to farmers' practices. Appropriate weed management practices help in efficient utilization of available resources and improve the product quality of groundnut crop.

Keywords: Groundnut, Herbicide, Weed management

GROUNDNUT (*Glycine max* L.) is one of the most important leguminous crops which contains about 44-50% oil and 22% protein. In India, it is cultivated in 39.31 lakh ha area with an annual production of 43.2 lakh MT. Groundnut is not only seen as an oil plant but also used for various purposes and can be grown in diverse environments throughout the world. Despite the high potential for rainfed groundnut production, low productivity is reported in these areas which has been ascribed to crop-weed competition and soil factors. In order to optimize groundnut yield, it is necessary to reduce the crop-weed competition with an efficient utilization of the given and available resources.

Weeds are one of the major resource consuming and limiting factors in groundnut production and cause substantial qualitative and quantitative losses in crop yield which may range from 25-45%. Degree of losses in groundnut yield depends on the type of weed flora, their density and duration of

competition for nutrient, water, light and space. Generally, farmers use inappropriate chemical herbicides (Imazethapyr 10% SL @ 70 g a.i./ha or Quizalofop-ethyl 5%EC @ 20 g a.i./ha) for the management of weeds, however, due to poor knowledge about the use of appropriate herbicides, their dose, time and method of application, it becomes less effective. Besides these, farmers do not use the appropriate nozzle for spraying of weedicides. They generally use hollow cone nozzle instead of flat fan nozzle for spraying

herbicides which significantly reduces the mortality of weeds, even after appropriate herbicides are being used. It has also been observed that farmers do not use recommended volume of solution which is necessary for a particular area, such as 200 litres of solution that facilitates the weed plants to be saturated sufficiently to cover an acre of land for effective control of weeds. If the recommended volume of solution is not applied, it will reduce the mortality of weeds significantly.

Table 1. Effect of herbicidal weed management in Groundnut

Technology	Yield q/ha	Cost of cultivation/ha	Gross return (₹/ha)	Net return (₹/ha)	Addit-ional income (₹/ha)	B:C Ratio	Weed density/ m ²	Weed control efficiency (%)
Imazethapyr 10% SL @ 70 g a.i./ (Farmers Practices)	9.5	37700	50112	12412	32243	1.3	78.5	
Imazethapyr 10% SL @ 100 g a.i./ha + Quizalofop-ethyl 5% EC @ 37.5 g a.i./ha (Recommended Practices)	16.2	40800	85455	44655		2.1	5	93.6

Performance

Verification trials (FLD) on weed management on the farmers' field recorded increase in production up to 6.7 q/ha which raised income of ₹32,243 per ha (Table 1) against their own traditional practices. Farmers were encouraged with these results and in next year they adopted same practice on their own on the whole groundnut area. Significant growth in yield, additional income, B:C ratio and reduction in weed density (93.6%) were recorded with the new technology as compared to farmers' traditional practices. This module effectively controls weeds at an early stage by using appropriate herbicides at 15-20 days after sowing, which results in reduction of the infestation of remaining weeds and ultimately reduces the crop-weed competition that leads to increase in yield of groundnut.

Benefits integrated with weed management are given here.

Saving natural resources

Low dose of weedicide leads to poor management of weeds, which

causes high competition for water and sunlight between crop and weeds, resulting in low yield of groundnut. While overdose of weedicide leads to pollution in soil, water and environment as well as damage the crops, which results in low yield. Therefore, all groundnut

growers should use an appropriate dose of herbicides.

Improved product quality

Due to integrated weed management practice, attack of other pests was significantly minimized and the quality of produce was better in terms of grain size, boldness of seeds and seeds were free from weeds. In contrast, under farmers' traditional practices, grain size is reduced along with contamination and objectionable weed seeds.

SUMMARY

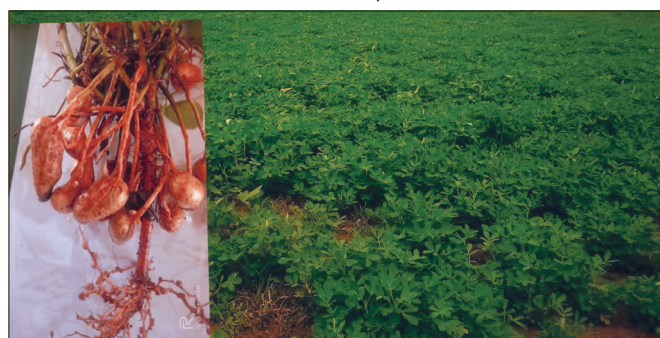
It can be stated that the imazethapyr along with quizalofop-ethyl can effectively control different categories of weeds in groundnut field. Higher economic yields may be achieved in groundnut crop without any phytotoxic effect under the treatment

(Imazethapyr 10% SL @ 100 g a.i./ha + Quizalofop-ethyl 5% EC @ 37.5 g a.i./ha at 20 DAS), where crops matured earlier than the control plots.

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Impact of appropriate herbicide on weed infestation and pod development



Complete weed management in groundnut under appropriate herbicides

Power operated groundnut stripper-cum-decorticator

Groundnut is the sixth most important oilseed crop in the world. An effort was made to combine the stripping and decortication operation and a small 0.5 hp motor operated groundnut stripper cum decorticator was developed. The equipment can be used only for stripping or stripping-cum-decortications purpose. The height of the hopper was kept as 93 cm considering the anthropometric body dimensions of female agricultural workers. In a manual stripper four women can strip

11 kg of pods in one hour. The developed power operated groundnut stripper has average output capacity of 12.1 kg/h and it needs only one operator, saving time as well as labour. The

threshing efficiency is around 95% and the total pod losses lies within 5%. The cleaning efficiency is 70%, which can be enhanced by adding a blower mechanism.

Source: ICAR Annual Report (2020)

