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EFFICACY OF *FLUAZIFOP.BUTYL* (FUSILADE 25 EC) AND *FENoXAPROP. P.ETHYL* (pUMA·S 69 EW) FOR WEED CONTROL IN . MUNGBEAN

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The study was conducted to find efficacy of *Fluozifop-butyl* and *Fenoxaprop-p-ethyl* applied post-emergence on mungbean. The mungbean *(Vigna radiata* (L) Wilczek) is a short duration, early maturing legume crop, whicb can fit well in tbe prevalent cropping system. Dry weigbt of weeds was maximum in weedy cbeck plots. The best weed control was found in band-weeding treatment hence weed dry weigbts were also minimum. Grain yield signifficantly varied among different treatments and was maximum in band-weeding. Application of *Fluozifop-butyl* or *Fenoxaprop-p-ethyl,* post-emergence berbicides at lower dose was as effective as at bigber rate. Increase in grain yield due to weed control was up by 45 % over weedy plots throughout the growing season.

Key words: herbicides, mungbean, weed control

INTRODUCTION

Pulses are important world food crops because they provide a cbeaper source of vegetable protein. The mungbean *(Vigna radiata)* containing 24 % protein (Poehlman, 1991) is a drought tolerant, legume crop, which can fit well in the prevalent cropping system. It is grown in Pakistan on 197.6 thousand hectares with a production of 91.2 thousand tonnes of grain annually giving an average yield of 461.5 kg per hectare (AnonymouS, 1998) which is much below the potential of our existing varieties. Abmad (1992) assessed that annual losses of food crops caused by weeds may be more than 10 billion rupees. Due to high competitive ability and high reproductive potential of weeds,. it is imperative to check their infestation. Moreover, intertillage with conventional tillage implements is quite difficult. It is labour intensive, uneconomical, weather dependent and crop damaging. It is very difficult to control weeds with methods other than chemical control. Chemical weed control is a quick method to control dense weed populations. The rate of herbicide application should be adjusted to give maximum weed control without significant injury to mungbean plant. Application rates in excess of those needed for effective control of weeds, cause unnecessary rise in production costs, increase the potential for injury to the mungbean plant, and enhance the risks of environmental contamination. A shift in weed flora from broad leaved to grassy weeds has been observed during past few years. A good number of new selective herbicides have been introduced in the country to combat weed problem. Performance of herbicides should be tested in the area of intended use before their adoption. Thus, their testing and evaluation under our conditions is necessary for their rational use. This experiment was aimed at studying the efficacy of two newly introduced herbicides Le. *Fluazifop-butyl* (Fusilade 25 EC) and *Fenoxaprop-p-ethyl* (Puma-S 69 EW) applied post-emergence at two different rates.

MATERIALS AND METHODS

Studies on weed management for mungbean were carried out at the Agronomic research area, University of Agriculture, Faisalabad during spring of 1992 and 1993. The experiment was conducted on a field heavily infested with important grassy weed flora. The weed seeds were broadcast and incorporated in each plot before sowing mungbean to ensure uniform stand of weeds. The study involved four replications and net plot measured 1.8 x 6 m. The mungbean variety 'NM-54' was sown in six rows 30 cm apart. Experimental plots were sown manually with a single row hand drill using 25 kg seed per hectare. Three irrigations, each of 75 mm, were applied. in addition to 47.6 and 59.5 mm rain received during the growing season of 1992 and 1993, respectively. All other cultural practices, except the treatments, were uniform for all the plots. Treatments under trial were weedy check, hand-weeding, and the application of *Fluazifop-butyl* (Fusilade 25 EC) @ 2.0 1 ha'\ *Fluazifop-butyl* (Fusilade 25 EC) @ 3.0 1 ha'\ *Fenoxaprop-p-ethyl* (Puma S 69 EW) @ 1.0 1 ha,l and *Fenoxaprop-p-ethyl* (Puma S 69 EW) @ 1.25 1 ha,l. The herbicides were sprayed 21 days after crop sowing, and the soil was in proper moisture condition. Knapsack hand

sprayer CP-3 having a boom of 1.8 m fitted with 4 T-Jet nozzles adjusted at a distance of 45 cm each was used for the purpose. In all chemical treatments, 500 litres of water per hectare was used. In hand-weeding treatment, two hoeings were given, each after last 1992 and 1993 irrigation. All other agronomic practices were kept uniform. Observations on weed dry weight, viable nodules and grain yield were recorded during the growing season. Herbicides used in this study were new and were not marketed in Pakistan. The data were analysed using analysis of variance and multiple comparison was made where necessary to test the significant difference of treatment means (Muhammad, 1995).

RESULTS AND DISCUSSION

Dry weight of weeds is a better criterion of the weed-crop competition than the weed density. Higher dry weight of weed reflects more utilization of soil and environmental resources by the weeds at the expense of the crop. Data on weed's dry weight in various weed control treatments showed significant differences (Table 1). In 1992 year, the lowest weed dry weight (3.74 g m") was recorded in plots where two hand-weedings were given each after 1992 and 1993 irrigation. Non-significant difference in weed dry weight was recorded among each other in plots treated with both herbicides at both levels. These weights were significantly lower than weed dry weights recorded in weedy check plots. The highest dry weight of weeds (86.79 g m") was recorded in weedy check treatment. Data for the 1993 year showed almost similar trend.

Data presented in Table 1 indicated that the differences among treatment means were not significant in both the years under study. It appears that herbicide application did not affect the nodulation activity of mungbean plants.

Grain yield per hectare is the major economic part of plant which is affected to a varying degree by contribution from yield components. The data presented in Table 2 showed that grain yield was affected significantly by various weed control treatments in both the years of study. Highest grain yield of 1380 and 1395 kg ha'! was obtained with hand-weeding in year 1992 and 1993, respectively. It was followed by *Fluazifop-butyl* applied at the rate of 2.0 and 3.0 I ha'! and *Fenoxaprop-p-ethyl* at the rate of 1.0 and 1.25 I ha'! producing grain yield from 1322 to 1343 kg ha", In 1992 hand-weeding was significantly effective while in 1993 the results were non-significant. This was attributed to effective weed control potential of these herbicides. Both the herbicides at each dose were effective in controlling weeds. The lowest grain yields of 960 and 979 kg ha'! in year 1992 and 1993, respectively were recorded in weedy check plots. The percentage increase in grain yield in weed control treatments over the weedy check ranged between 37.8 and 43.8 in year 1~92 and 37.5 and 42.5 in 1993. Yield components like pods per plant, number of grains per pod and 1000-grain weight contributed positively towards final yield. Balyan and Malik (1989) also found higher grain yield with the application of herbicides in mungbean.

Table 1. Efficacy *ofFluazifop-butyl* (Fusilade 25 EC) and *Fenoxaprop-p-ethyl* (Puma-S 69 EW) for weed control in mungbean and effect on weed dry weight and viable nodules

Treament	Dose (Iha'!)	Weed dry weight (g m") 1992	1993	Viable nodules (per plant) 1992	1993:
Weedycheck	-	86.79 a	93,29 a	33.68 b	36.34~
Hand-weeding	-	3.74 e	6.41 d	,42.69 a	40.99'
Fluazifop-butyl	2.00	15.02 b	19,08 be	39.38 ab	40.81
Fluazifop-butyl	3.00	14,25 b	18,28 e	37,42 ab	39.38
Fenoxaprop-p-ethyl	1,00	14.18 b	20.96 be	40.64 a	40,49
Fenoxaprop-p-ethyl	1.25	15.05 b	23,74 b	36.53 ab	45.57

Means not sharing a letter in common differ significantly at 0.05 probability; N.S. = Non-significant.

Table 2. Efficacy of *Fluazifop-butyl* (Fusilade 25 EC) and *Fenoxaprop-p-ethyi* (Puma-S 69 EW) for weed control in mungbean and effect on grain yield

Treatment	Dose (I ha,I)	1992	% increase over control	1993	% increase over control
Weedy check	-	960 c	-	979 b	-
Hand-weedina	-	1380 a	43.8	1395a	42.5
Fluazifoo-butvl	2.00	1322b	37.8	1354a	38.3
Fluazifoo-butvl	3,00	1343b	39.9	1361 a	39.0
Fenoxaoroo-o-ethvl	1,00	1334 b	39.0	1346 a	37,5
FenoxaoroD-D-ethyl	1,25	1340b	39.6	1347 a	37.6

Means not sharing a letter in common differ significantly at 0.05 probability.

Conclusions: Grain yield significantly varied among different treatments and was maximum in hand-weeded plots. Lower rates of herbicides were as effective in increasing grain yield as the higher rates. Grain yield in weed control plots was 37.8 to 43.8 % higher than weedy check.

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