https://doi.org/10.29321/MAJ.10.A01916

Madras Agric. J. 77 (1) : 36-39 January, 1990

EVALUATION OF HERBICIDAL CONTROL OF BERMUDAGRASS (CYNODON DACTYLON L.) IN GROUNDNUT (ARACHIS HYPOGAEA L.)

O.P.GILL, O.P.GUPTA, YOGENDRA KUMAR
Agricultural Research Station, Sukhadia University
Durgapura, Jaipur (Rajasthan)

ABSTRACT

Field trials were conducted on a bermudagrass infested field to evaluate certain herbicides and manual methods for controlling this grass selectively in groundnut. It was found that post emergance application of fluazifop-butyl at 125 and 250 g ha^{-1} reduced the weed yield by 8.76 and 12.73 q ha^{-1} over weedy check and increased the groundnut pod yield by 8.47 and 11.73 q ha^{-1}, respectively. These herbicide treatments were found more effective than even manual weeding, both in terms of suppression of bermudagrass and boosting of yield.

KEY WORDS: Bermuda grass, Herbicide, Groundnut yield.

Groundnut being a rainy season crop is seriously invaded by luxuriant growth of a variety of weeds. In many fields in India bermudagrass often forms a dominant weed flora. This perennial grass is not kept in check despite repeated manual weedings which suppresses the crop growth. The herbicides made available thus far for use in groundnut have been found effective only against annual grasses and broad leaf weeds. In India fluchloralin is most commonly used for this purpose (Ghosh, and Singh, 1977). During recent years, two new test herbicides, viz., fluazifop-butyl and Flex have been reported effective against bermudagrass. Both these are shoot active compounds. However, their field studies on selectivity to groundnut in different agro-climatic conditions are much limited. Therefore, the present field study was taken up with the objective of evaluating the two compounds vis-a-vis fluchloralin and manual weeding for selective control of bermudagrass in groundnut.

MATERIALS AND METHODS

The experiments are conducted during 1984 to 1986 on a site with past history of dense stand of bermudagrass. The soil of the experiment site was loamy sand, of pH 8.1 and with organic carbon content of 0.22 per cent. The herbicides evaluated were fluazifop-butyl (at 125 and 250

g ha^{-1}) and its combinations with Flex (at 125 and 250 g ha^{-1}) and fluchloralin (at 750 g ha^{-1}). Manual weedings and unweeded checks were included in the experiments. In all, there were thirteen treatments which were tried in a randomized block design with four replications. Fluazifop-butyl and flex were sprayed in water, 3 weeks after sowing whereas fluchloralin was used for preplant incorporation treatment. Groundnut variety M 13 was sown in rows 40 cm apart during first week of July each year. The crop received four irrigations during the season, besides a rainfall of 323.4 mm. It was fertilised with 20 kg N and 40 kg P_2O_5 ha^{-1}. The pods were dug 118 days after sowing. Observations were recorded on the yield of bermudagrass as well as the pod yield peanut.

RESULTS AND DISCUSSION

Of the three herbicides tried, fluazifop-butyl was found most effective in controlling bermudagrass. Its post emergence application caused a slow death of the shoots which turned Whitish green and the affected shoots never recovered during the crop season. In terms of dry matter yield of bermudagrass during the crop season, fluazifop-butyl caused a reduction of 8.76 q ha^{-1} at 125 g ha^{-1} dose and 12.73 q ha^{-1} at 250 g ha^{-1} dose over the weedy check plots (Table). In comparison to manually weeded plots, the higher dose of fluazifop-butyl (250 g ha^{-1}) caused a significant reduction of 4.36 q ha^{-1} in dry matter yield of bermudagrass. Fluchloralin and flex also tend to cause some reduction in the growth of bermudagrass though their effects were not so pronounced as that of fluazifop-butyl. The pod yield of groundnut was found lowest in the unweeded control plots (6.6 q ha^{-1}). Further, all manual and chemical methods of weed control tried increased the pod yield of groundnut (Table). But the increase was highest when fluazifop-butyl was applied 3 weeks after sowing at 250 g ha^{-1}. At this dose the increase in pod yield was 5.0 q ha^{-1}. At lower dose of 125 g ha^{-1}, fluazifop-butyl gave 3.26 q ha^{-1} less pod yield then at its high dose. It was interesting to note that fluazifop-butyl at 250 g ha^{-1} gave higher pod yield than even the hand-weeded crop. This was due to the fact that immediately after application of herbicide there was stunting of bermuda- and it never recovered to compete with the crop. But in handweeded

Table. Effect of Different Weed Control Treatments on Oven Dry Weight and Pod Yield of Cynodon dactylon in Groundnut (1984 to 1986)

Treatments	Dose gm ha^{-1}	Oven dry weed weight (g ha^{-1})				Pod yield (g/ha)			
		1984	1985	1986	Pooled Average	1984	1985	1986	Pooled Average
1. Weedy check	-	16.47	19.45	15.96	17.29	7.67	4.62	7.47	6.59
2. Manually weeded 3 w.a.s.	-	8.30	9.98	8.48	8.92	14.59	9.44	16.15	13.39
3. Fluchloralin p.p.i.	750	11.00	15.78	9.59	12.12	11.37	8.85	10.42	10.21
4. Fluazifop-butyl 3 w.a.s.	125	7.70	10.46	7.44	8.53	16.31	11.98	16.89	15.06
5. Fluazifop-butyl 3 w.a.s.	250	3.83	5.28	4.56	4.56	20.08	14.45	20.44	18.32
6. Flex 3 w.a.s.	125	9.90	14.91	10.74	11.85	11.89	9.24	10.55	10.56
7. Flex 3 w.a.s.	250	9.20	14.20	9.90	11.10	13.35	9.76	11.72	11.61
8. Fluchlorelin p.p.i. + Fluazifop-butyl 3 w.a.s.	750 250	9.07	12.61	8.38	10.02	13.48	11.00	13.09	12.52
9. Fluchloralin p.p.i. + Fluazifop-butyl 3 w.a.s.	750 250	8.57	8.59	7.56	8.24	13.84	11.72	15.36	13.64
10. Fluazifop-butyl 3 w.a.s. + Flex 3 w.a.s.	125 125	8.00	12.73	9.82	10.18	14.55	8.98	14.52	12.8
11. Fluazifop-butyl 3 w.a.s. + Flex 3 w.a.s.	250 125	7.67	9.22	8.36	8.42	16.44	11.20	15.49	14.38
12. Fluazifop-butyl 3 w.a.s. + Flex 3 w.a.s.	125 250	9.00	11.30	9.89	10.06	13.78	9.57	15.23	12.86
13. Fluazifop-butyl 3 w.a.s. + Flex 3 w.a.s.	250 250	7.87	8.66	8.60	8.38	16.57	11.46	15.49	14.51
F test		sig.	sig.	sig.	sig.	sig.	sig.	sig.	sig.
S.Em±		0.71	0.94	0.71	0.86	0.93	0.60	0.62	0.73
C.D. at 5%		2.06	2.70	2.04	2.40	2.73	1.72	1.78	2.06
C.V. %		13.66	15.99	15.86	-	11.44	11.79	8.80	

Fluazifop-butyl was applied through fusilade and fluchloralin through Basalin.

w.a.s. = Weeks after sowing

p.p.i. = Preplant Incorporation

plots every time the weed was cut, it regenerated into green mass and competed with the crop. This effect of fluazifop-butyl was less apparent at its lower dose of 125 g ha^{-1} than at its higher dose of 250 g ha^{-1}. Further, a comparison of treatments T5 and T9 indicated that despite the weed yield in the two treatments being equal, the groundnut yield was reduced in treatment combining fluchloralin and fluazifop-butyl (T9). It is quite possible that after the preplant application of fluchloralin the groundnut crop became less tolerant to post emergent fluazifop-butyl.

Thus, the three years' studies established that fluazifop-butyl was a highly selective herbicide for groundnut and that its post emergence application at 125 to 250 g ha^{-1}, 3 weeks after sowing, could very well control dense growth of bermudagrass. However, fluazifop-butyl was not found compatible with fluchloralin, which is recommended in groundnut to control annual weeds. This is the first report of highly successful bermudagrass control in groundnut with post-emergent fluazifop-butyl in India.

ACKNOWLEDGEMENT

The Authors acknowledge the help rendered by field staff of Agronomy Department in the field work and appreciate the facilities given for research by the then Joint Director (Research), A.R.S., Durgapura. The facilities offered by Dr.B.L.Sharma, currently Professor & Incharge, Department of Agronomy in preparation of this manuscript are also acknowledged.

REFERENCES

GHOSH, A.K. and SINGH, S.S., 1977. Response of groundnut to weed control. Weeds Abst. 26 (11): 348.

RESEARCH NOTES:

Madras Agric. J. 77 (1) : 39-40 January, 1990

SEED SIZE, SEEDLING VIGOUR AND STORABILITY IN CLUSTERBEANS

The bulk seeds of clusterbeans var. Pusanavbhagar obtained from the seed crop raised during rabi of 1986-87 at the Agricultural Research Station, Bhavanisagar were size graded by using different size sieves to study the influence of seed size on