Indian J. Weed Sci. **37** (1 & 2) : 135-136 (2005) *Short Communication*

Studies on the Efficacy of Trifluralin and Imazethapyr for Weed Control in Lucerne

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The area under lucerne or alfalfa is fluctuating and the perenniability of this fodder crop is not fully exploited by the farmers due to the problems related to weeds, more so to the specific weed cuscuta. The problem is more severe in the crop sown by broadcasting. Weeds in alfalfa are reported to cause yield losses as high as 95% (Dawson and Rincker, 1982). In order to tackle the weed problem, the efficacy of two promising herbicides, trifluralin and imazethapyr at different stages of application was tested in an experiment conducted during 2002 at Students Farm, College of Agriculture, Rajendranagar, Hyderabad. There were 13 treatments (Table 1). Trifluralin at 1.0 kg ha^{-1} was tested as PPI (pre-plant incorporation), pre-emergence (one day after sowing), early post-emergence (8 DAS) and post-emergence (12 DAS). Imazethapyr was tested at two doses–0.1 and 0.2 kg ha^{-1} under different stages as above, except PPI. These treatments were tested with three checks – one hand weeding at 20 DAS, two hand weedings at 20 and 40 DAS and unweeded control. All the treatments were replicated thrice in randomized block design. The crop was sown on February 14, 2002 at a row spacing of 30 cm adopting 10 kg ha^{-1} seed rate. Lucerne seed contaminated with cuscuta seed available in the local market was deliberately used to have the incidence of cuscuta in the field. Herbicides were applied with knapsack sprayer as per the treatments at spray volume of 600 l ha^{-1}.

Cyperus rotundus, Cynodon dactylon, Dactylactenium aegyptium, Echinocloa colona, Amaranthus spinosus, Parthenium hysterophorus, Tribulus terrestris, Trianthema portulacastrum, Euphorbia hirta, volunteer weed *Crotolaria juncea* and the parasitic weed cuscuta were noticed in the field. Untreated plots at 20 DAS had 182 to 187 weeds m^{-2}. Trifluralin as PPI could bring 79% weed

Table 1. Effect of treatments on weed density, weed dry weight, cuscuta dry weight and green fodder yield of lucerne at first cut

Treatment	Dose (g ha^{-1})	Application stage (DAS)	Weed density (No. m^{-2})	Weed dry weight (g m^{-2})	Cuscuta dry weight (g m^{-2})	Green fodder yield (t ha^{-1})
Trifluralin	1000	PPI	16.1 (261)	118.6	2.93	2.7
Trifluralin	1000	1	15.2 (233)	115.3	3.16	2.8
Trifluralin	1000	8	17.7 (313)	136.0	3.96	2.6
Trifluralin	1000	12	18.5 (345)	137.3	4.13	2.5
Imazethapyr	100	1	9.0 (83)	41.0	0.00	3.5
Imazethapyr	100	8	14.6 (215)	81.0	0.00	3.1
Imazethapyr	100	12	15.5 (241)	88.3	0.46	2.9
Imazethapyr	200	1	7.9 (63)	31.6	0.00	3.6
Imazethapyr	200	8	13.8 (192)	79.6	0.00	3.2
Imazethapyr	200	12	15.5 (240)	86.0	0.23	3.1
Hand weeding	-	20	13.2 (176)	54.6	3.63	3.3
Hand weeding	-	20 & 40	6.7 (46)	18.0	0.96	3.8
Weedy	-	-	20.9 (440)	161.0	6.26	2.3
LSD (P=0.05)			0.91	3.3	0.21	0.23

DAS–Days after sowing, PPI–Pre-plant incorporation.
Figures in parentheses are actual weed counts, data subjected to square root transformation.

control. Pre-emergence application was relatively less effective. The effectiveness was reduced further with delayed application as early post-emergence and post-emergence treatments. Imazethapyr was more effective than trifluralin. Pre-emergence use of this herbicide controlled 97 to 98% of total weeds.

By the time of first cut (60 DAS), the weed number increased very rapidly in all the treatments. The weed density was significantly low in the plots that were hand weeded twice (Table 1). Most importantly, the effect of pre-emergence imazethapyr continued till the first cut and WCE was comparable with that under hand weeding twice.

The results with parasitic weed cuscuta were more conspicuous. The infestation of cuscuta was measured in terms of dry weight. Cuscuta was not noticed in the pre-emergence and early post-emergence treatments with imazethapyr at both the doses tested.

Pre-emergence application of imazethapyr resulted in good crop stand and growth coupled with excellent weed control ultimately leading to higher green fodder yield.

The results clearly favour the pre-emergence use of imazethapyr at 200 g ha^{-1} in lucerne, considering the control of all types of weeds including cuscuta, suppression of the growth of emerged weeds, very low crop-weed competition during the critical period of crop establishment coupled with higher green fodder yield.

REFERENCE

Dawson, J. H. and C. M. Rincker, 1982. Weeds in new seedlings of alfalfa (*Medicago sativa*) for seed production : computation and control. *Weed Sci.* **30** : 20-25.