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Effect of Various Weedicides on Weed Control and Yield of Lentil (*Lens culinaris Medic*) Crop in Salt Affected Soil

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Abstract: Effect of various weedicides with different doses was studied for chemical weed control and yield of lentil crop. Stomp 330 EC (Pendimethalin) pre-emergence @ 1.00, 1.25 and 1.50 kg ai ha⁻¹, Treflan-R 48 EC (Trifluralin), pre-emergence incorporated @ 0.25, 0.50 and 0.75 kg ai ha⁻¹ and Fusillade 25 EC (Flauzifop butyl) post-emergence @ 0.125, 0.250 and 0.500 kg ai ha⁻¹ were compared with hand weeding on sandy loam saline-sodic soil. The soil having EC_e 4.9 dS m⁻¹, pHs 8.70 and SAR 18.10 (m mol l⁻¹)^{1/2} was selected. The test variety was masoor-85. All the weedicides at different doses significantly controlled the weeds but stomp @ 1.50 kg ai ha⁻¹ pre-emergence application produced higher grain yield (1465.00 kg ha⁻¹) among all other treatments which was followed by stomp @ 1.25 kg ai ha⁻¹ (1405.90 kg ha⁻¹) and hand weeding (1405.42 kg ha⁻¹).

Key words: Stomp, Treflan, Fusillade, masoor, weeding

Introduction

Among several arguments of low yield, weed infestation is prime importance because lentil has a very weak competitive ability. Lentil is one of the important traditional grain legumes. Despite its importance the yield is very low. In Pakistan lentil yield is 725.00 kg ha⁻¹ (Anonymous, 1999), which is very low than the production potential of existing varieties. Ross and Lembi (1985) studied that the use of chemicals is considered to easy, effective and efficient. Salkin and Naygaari (1983) and Rafique (1980) found that application of Treflan @ 1 L ha⁻¹ before sowing and Alachlor @ 3 L ha⁻¹, Tribanil @ 1 kg ha⁻¹ as pre-emergence herbicides gave reasonably good weed control with higher grain yield. In another experiment application of 1 and 2 L ha⁻¹, Alachlor (pre-emergence) either with or without hand weeding after 30 days of sowing gave maximum grain yields (0.814 t. ha⁻¹). Singh and Sharma (1987) and Borgahain (1987) investigated that effective weed control in green gram and highest seed yield were obtained with Disromate @ 7 kg ha⁻¹ pre-emergence. Ahmad *et al.* (1996) observed that pre-emergence application of stomp @ 1.25 kg ha⁻¹ produced more grain yield (1398 kg ha⁻¹) than Treflan, Gramenon and hand weeding in lentil crop. Jamil *et al.* (2000) studied that the maximum grain yield (1777 kg ha⁻¹) was obtained with the application of stomp @ 3250 ml ha⁻¹ at pre-soaking irrigation treatment under that irrigated conditions in lentil crop.

This study was conducted to investigate the importance of lentil crop and need to test the effect of various weedicides for weed control and increase in grain yield of lentil.

Materials and Methods

The investigation to evaluate the various chemical weed control practices in lentil was carried out on a sandy loam saline-sodic soil in Pindi Bhattian for three years from 1997-98 to 1999-2000. Laboratory analysis of the field before sowing the crop, was EC_e 4.9 dS m⁻¹, SAR 18.10 (m mol l⁻¹)^{1/2} and pH 8.70. The treatments were consisted of three levels each weedicides,

Stomp 330 EC (pre-emergence) @ 1.00, 1.25 and 1.50 kg ha⁻¹, Treflan-R 48 EC (pre-emergence) incorporated @ 0.25, 0.50 and 0.75 kg ai ha⁻¹ and Fusillade 25 EC (post-emergence) @ 0.125, 0.250 and 0.500 kg ha⁻¹. Hand weeding (two-hand weeding were applied with Kasola 25 and 45 days after sowing) and check (control) treatments were also included in the study to compare weedicides. The weedicides were applied according to treatments and plan. Treatments were replicated three times having plot size of 1.8 X 6.00m² in Randomized Complete Block Design. The variety Masoor-85 was sown in 30 cm apart in rows with a single row hand drill on well-prepared seedbed. A basal dose of fertilizer @ 30-60 NP kg ha⁻¹ was applied before sowing. Plant to plant distance was maintained (15 cm) by thinning. Stomp (pre-emergence) weedicide was sprayed with the help of Knapsack sprayer just after sowing, Treflan (pre-emergence) was incorporated into the soil after spraying and Fusillade (post-emergence) was sprayed 30 days after sowing in the rows using a special shield. All other crop management practices were kept uniform for all the treatments. The crop was sown in the mid November each year.

Data regarding weed population m⁻², plant height, number of branches/plant, 1000-grain weight and grain yield were recorded. The data were pooled of all the three years and analyzed statistically by employing the analysis of variance techniques (Fisher, 1958). Treatment means were compared by using the LSD test at 5 % level of probability (Steel and Torrie, 1984).

Results and Discussion

In the field of experiment, weed population were comprised of Bathu (*Chenopodium album* L.), Shahtra (*Fumaria parviflora* Lam.), Maina (*Medicago denticulate* L.), Karand (*Chenopodium murale* L.) and It-sit (*Trianthema portulacastrum* L.) All the weedicide treatments suppressed the weed population significantly and there was considerable variation among different weedicides and their levels. Application of Stomp @ 1.25 and 1.50 kg ha⁻¹ appeared effective in decreasing the weed population (4.18 and

Table 1: Effect of different levels of various weedicides on weed control, grain yields and yield parameters of lentil crop in saline-sodic sandy loam soil

Weedicides (kg ai ha ⁻¹)	No. of weeds m ⁻²	Plant height at harvest (cm)	No. of branches/ plant	1000-grain weight (g)	Grain yield Kg ha ⁻¹
Stomp 330 EC (pre-emergence)	-	-	-	-	-
1.00	8.10g	50.15g	11.70c	15.70c	1210.10c
1.25	4.18j	47.59h	13.10b	17.85b	1405.90b
1.50	4.90i	46.00i	14.85a	19.10a	1465.00a
Treflan - R 48 EC (Incorporated in the soil)	-	-	-	-	-
0.25	10.70f	58.11c	9.25d	15.30c	925.75g
0.50	12.65e	54.00e	7.85de	14.00d	975.50f
0.75	7.10h	57.00d	6.00g	15.50c	1015.00d
Fusillade 25 EC (Post-emergence)	-	-	-	-	-
0.125	48.91b	54.35e	7.30ef	15.75c	795.31h
0.250	35.10c	52.98f	6.91f	13.90d	765.70i
0.500	23.05d	55.00e	7.00f	14.56d	985.00e
Handing weeding (Two hoeings)	2.5k	59.51b	13.15b	18.95a	1405.42b
Check (Un-weeded)	135.4a	60.5a	5.50g	11.00e	552.87j
LSD	0.7226	0.9873	0.8221	0.6791	7.011

Any two means not sharing a common letter differ significantly at 5 % level of probability.

4.90 weeds m^{-2}) and producing 1405.90 kg ha^{-1} and 1465.00 kg ha^{-1} grain yield of lentil, respectively (Table 1) as compared to other weedicides. However, hand weeding (two hoeing) proved the most effective method to reduce the weed population (2.5 weeds m^{-2}). Treflan at higher rate (0.75 kg ha^{-1}) suppressed more weed population than Fusillade. However, Fusillade (Table 1) checked the growth of weeds but weed plants were not killed. It killed only few broad-leaved weeds. The similar results were found by Ross and Lembi (1985), Salkin and Naygaari (1983), Rafique (1980), Singh and Sharma (1987) and Borgahain (1987).

Lentil grain yield significantly increased in all the treatments (Table 1). Stomp @ 1.50 kg ha^{-1} application significantly gave the maximum grain yield (1465.00 kg ha^{-1}) followed by Stomp @ 1.25 kg ha^{-1} giving grain 1405.90 kg ha^{-1} and hand weeding (1405.42 kg ha^{-1}), respectively. The increase in grain yield was due to better weed control leading less competition by weeds providing maximum space for lateral growth and reduction in plant height. Grain yield also increased due to increase in number of branches/plant, 1000-grain weight and reduction in weed population (Table 1). However Stomp @ 1.50 kg ha^{-1} bore relatively more number of branches/plant and higher 1000-grain weight as compared to rest of the doses and weedicides. The results are in accordance to the findings of Salkin and Naygaari (1983), Rafique (1980), Ahmad (1996) and Jamil *et al.* (2000).

It is concluded from the results (Table 1) that application of Stomp @ 1.50 kg ha^{-1} produced the highest grain yield (1465 kg ha^{-1}) of lentil under sandy loam salt affected soil. But hand weeding and Stomp @ 1.25 kg ha^{-1} remained statistically at par (Table 1) producing grain yield of 1405.90 kg ha^{-1} and 1405.42 kg ha^{-1} respectively.

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