



Research Article

Effect of herbicides and cultural practices on nutrient uptake by chickpea and weed

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ABSTRACT : A field experiment was conducted during winter season 2010-2011 at farm of Agronomy Department, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, to study the effect of herbicides and cultural practices on nutrient uptake by chickpea and weed. The maximum nutrient uptake by chickpea was found in 2H at 15 and 30 DAS + HW at 40 DAS (T_{10}) followed by T_8 , T_4 , T_9 and T_5 and the lowest uptake of nutrients was found in treatments T_{10} followed by T_8 , which may be due to lowest weed count.

KEY WORDS : Herbicides, Cultural, Practices on nutrient, Uptake, Chickpea

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INTRODUCTION

Chickpea is an important crop of *Rabi*, besides this limited moisture crop has to compete with weeds. Timely weed management practices plays an important role in the successful cultivation of the crop. Chickpea suffers severely due to competition stress of weeds with yield reduction to the tune of 20 to 49.5 per cent depending on nature and density of weeds. The conventional method of weed control by hoeing and hand weeding are very laborious, expensive and time consuming and needs to be often repeated at different intervals. Therefore, the present investigation was planned to find out efficacy of herbicides and cultural management on weed control in gram

(*Cicer arietinum*).

EXPERIMENTAL METHODS

An investigation was carried out during 2010-2011 at farm of Agronomy Department, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The experiment was laid out in Randomized Block Design with 3 replications and 10 treatments. These treatments combination of pre and post emergence herbicides with cultural practices and one weedy checks. Treatments combinations as Weed check (T_1), Imazethapyr PRE 75 g ha⁻¹ (T_2), Imazethapyr POE 75 g ha⁻¹ (T_3), Pendimethalin PRE 1 kg ha⁻¹ (T_4), Quizalofop-p-ethyl POE 50g ha⁻¹ (T_5), Imazethapyr PRE 75 ha⁻¹ + 1H at 30 DAS (T_6), Imazethapyr POE 75g ha⁻¹ + 1H at 40 DAS (T_7), Pendimethalin PRE 1kg ha⁻¹ + 1H at 40 DAS (T_8), Quizalofop-p-ethyl POE 50g ha⁻¹ + 1 H at 40 DAS (T_9), 2H at 15 and 40 DAS + 1 HW at 30 DAS (T_{10}). The chickpea variety (Jaki 9218) sown at gross plot size 5 x 5.5 m and net plot size 4.2 x 4 m, on 4th November, 2010. Weed dry weight, WCE, weed index, nutrient uptake by crop and weed were workout.

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EXPERIMENTAL RESULTS AND ANALYSIS

In chickpea, major weed flora were observed during *Rabi* season was *Agemone mexicana*, *Melilotus alba*, *Portulaca oleraceae*, *Euphorbia hirta*, *Digera arvensis*, *Phasalis minima*, *Cyperus rotundus*, *Convolvus arvensis*, *Amaranthus viridis* etc. in field.

Lowest weed population and weed dry weight was

found in Pendimethalin 1 kg ha⁻¹ with 1H at 40 DAS which was at par with cultural treatments 2H at 15 and 40 DAS with HW at 30 DAS. Weed control efficiency is highest in cultural treatments 2H at 15 and 40 DAS with HW at 30 DAS (85.09%) which was at par with treatments PE Pendimethaline 1kg ha⁻¹ with H at 40 DAS (Table 1). Weed index also minimum with treatments PE Pendimethaline 1kg ha⁻¹ with H at 40 DAS. Similar results were also observed

Table 1: Weed dry weight, WCE and weed index in chickpea as affected by different treatments

Treatments	WDW(g)	WCE(%)	WI (%)
Weedy check	17.31	0	61.59
Imz PE 75 g ha ⁻¹	4.64	73.19	17.71
Imz POE 75 g ha ⁻¹	4.54	73.77	22.88
PEN PE 1 kg ha ⁻¹	4	76.89	6.07
QEZ POE 50 g ha ⁻¹	4.41	74.52	12.53
Imz PE 75 g ha ⁻¹ +H at 30 DAS	4.20	75.73	16.39
Imz PE 75 g ha ⁻¹ +H at 40 DAS	4.36	74.81	18.89
PEN PE 1 kg ha ⁻¹ +H 40 DAS	3.10	82.09	2.28
QEZ POE 50 g ha ⁻¹ +H 40 DAS	4.13	76.14	12.38
2H at 15 and 40 DAS + HW at 30 DAS	2.58	85.09	0
S.E.±	0.76		
C.D.	2.26		
G.M.	5.33	69.22	61.59

Table 2: Nutrient uptake by plant (kg ha⁻¹) as influenced by different weed control treatments

Treatments	Nutrient uptake by seed (kg ha ⁻¹)			Nutrient uptake by straw (kg ha ⁻¹)			Total nutrient uptake by plant (kg ha ⁻¹)		
	N	P	K	N	P	K	N	P	K
T ₁ -Weedy check	23	7.05	12.35	8.59	1.92	17.63	31.72	8.97	29.98
T ₂ -IMZ PE @ 75 g ha ⁻¹	71.4	16.78	27.83	16.98	3.77	33.13	88.39	20.56	60.97
T ₃ -IMZ POE @ 75 g ha ⁻¹	67.3	15.66	26.55	17.03	3.74	32.41	84.37	19.41	58.97
T ₄ -Pen @ 1000 g ha ⁻¹ PE	82.6	19.69	33.18	19.79	4.89	38.53	102.39	24.59	71.71
T ₅ -QZF @ 50 g ha ⁻¹ POE	76.4	18.03	30.28	18.38	4.16	35.31	94.79	22.19	65.60
T ₆ -IMZ @ 75 g ha ⁻¹ PE+1H at 30DAS	73.9	17.20	29.04	17.27	4.11	33.79	91.18	21.31	62.84
T ₇ -IMZ POE @ 75 g ha ⁻¹ + 1H at 40DAS	70.93	16.17	27.57	16.71	3.79	32.77	87.64	19.97	60.34
T ₈ -Pen @ 1000 g ha ⁻¹ PE + 1H at 40DAS	87.75	21.09	36.48	19.40	4.91	41.10	107.16	26.01	77.58
T ₉ -QZF @ 50 g ha ⁻¹ POE +1H at 40DAS	77.64	18.78	30.7	18.70	4.31	36.66	96.34	23.09	67.36
T ₁₀ -2H at 15 and 40 DAS + 1HW at 30 DAS	75	21.88	36.87	21.15	5.193	41.80	108.49	27.08	78.67
S.E.±	7.5	1.39	2.80	4.7	0.57	2.1	7.95	1.78	4.61
C.D. at 5%	22.3	4.14	8.33	14.05	1.71	6.3	23.63	5.3	13.71
G.M.	71.84	17.14	29.08	17.40	4.08	34.31	89.25	21.32	63.40

Table 3 : Nutrient uptake of weeds (kg ha⁻¹) as influenced by different weed control treatment

Treatments	Nutrient uptake by weeds		
	N (kg ha ⁻¹)	P (kg ha ⁻¹)	K (kg ha ⁻¹)
T ₁ -Weedy check	22.96	9.21	20.17
T ₂ -IMZ PE @ 75 g ha ⁻¹	12.06	10.72	10.63
T ₃ -IMZ POE @ 75 g ha ⁻¹	13.78	11.11	10.41
T ₄ -Pen @ 1000 g ha ⁻¹ PE	10.30	8.50	8.74
T ₅ -QZF @ 50 g ha ⁻¹ POE	10.88	8.55	8.72
T ₆ -IMZ @ 75 g ha ⁻¹ PE+1H at 30DAS	12.38	10.21	10.07
T ₇ - IMZ POE @ 75 g ha ⁻¹ +1H at 40DAS	11.51	9.98	9.65
T ₈ -Pen @ 1000 g ha ⁻¹ PE+ 1H at 40DAS	7.71	5.44	5.11
T ₉ -QZF @ 50 g ha ⁻¹ POE+ 1H at 40DAS	7.59	6.36	6.33
T ₁₀ -2H at 15 and 40 DAS+ 1HW at 30 DAS	7.80	5.84	5.68
S.E. ±	1.18	0.46	0.48
C.D. at 5%	3.52	1.38	1.42
G.M.	11.7	8.59	9.55

by Balyan and Bhan (2007); Dungarwal and Chaplot (2002) and Yadav *et al.* (1983) in chickpea.

Total nutrient uptake (N, P and K) by crop as influenced by various weed control treatments are presented in Table 2.

Treatment weedy check (T₁) recorded significantly lowest nutrient uptake among all the treatments. The maximum nutrient uptake was found in 2H at 15 and 30 DAS + HW at 40 DAS (T₁₀) followed by T₈, T₄, T₉ and T₅. Similar results were observed by Naidu *et al.* (1982) in groundnut crop and Singh *et al.* (2003) in chickpea.

Nutrient uptake (N, P and K) by weeds as affected by various treatments are presented in Table 3.

The above data showed that treatment weedy check (T₁) recorded significantly maximum nitrogen, phosphorus and potassium uptake than other weed control treatment.

The lowest uptake of nutrients was found in treatments T₁₀ followed by T₈, which may be due to lowest weed count. Similarly Sumathi *et al.* (2009) shows that un-weeded check removed 42 kg N, 15.5 kg P and 45.0 kg ha⁻¹ and monetary loss in terms of nutrient removal by weeds was maximum in un-weeded check.

REFERENCES

- Balyan, R.S. and Bhan V.M. (1987). Promising herbicides for weed control in chickpea. *Indian J. Weed Sci.*, **40**:10-17.
- Dungarwal, H.S. and Chaplot, P.C. (2002). Chemical weed control in chickpea (*Cicer arietinum* L.). *Indian J. Weed Sci.*, **34** (3&4): 208-212.
- Naidu, L.G.K., Reddy, G.H.S. and Rajan, M.S.S. (1982). Nutrient uptake as influenced by crop weed competition in groundnut. *Indian J. Weed Sci.*, **14** (2): 137-140
- Singh, R.V., Sharma, A. K. and Tomar, R.K.S. (2003). Weed control in chickpea (*Cicer arietinum*) under late sown condition. *Indian J. Agron.*, **48** (2): 114-116.
- Sumathi V., Rao D.S. Koteswara1, Subramanyam, D. and Reddy, D.S. (2009). Effect of planting pattern and weed management on nutrient uptake and economics of *Rabi* sunflower and its associated weed. *Indian J. Weed Sci.*, **41** (1&2): 65-70.
- Yadav, S.K., Singh, S.P. and Bhan, V. M. (1983). Weed control in chickpea. *Tropi. Pest Mgmt.*, **29**(3):297-398.

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