



## Role of MSO adjuvant in enhancing bioefficacy of imazethapyr applied to greengram

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Green gram is the second most important pulse crop grown in Telangana state in an area of 4.40 lakh ha with a productivity of 493kg/ha. Weed management is an important factor for enhancing the productivity of green gram. Yield losses in green gram due to weeds have been estimated in the range of 30-50%. Imazethapyr usage is not very popular among green gram growers of the state due to phytotoxicity at 75 g/ha dose or growth reduction. Spray adjuvants are used with post-emergence herbicides to the spray tank to improve the herbicide activity and they will improve the herbicide absorption. MSO adjuvant is a kind of oil based adjuvant which enhances the efficacy of herbicides by increasing the absorption of the herbicides by weeds and helps in reducing the herbicide dosage while achieving desired weed control. Keeping this in view, the present investigation was undertaken in green gram.

### METHODOLOGY

A field experiment was conducted during *Kharif* 2013 at student Farm, College of Agriculture, PJTSAU, Rajendranagar, Hyderabad in Southern Telangana Agro-climate zone of Telangana State. Ten weed control treatments were evaluated (Table-1) in randomized block design and replicated thrice. Green gram (WGG-37) was sown on at 30 X10 cm. Pendimethalin 30% EC was applied as pre-emergence (PE) after sowing, imazethapyr and quizalofop-ethyl were sprayed at 2-3 leaf stage of weeds (15 days after sowing) and manual weeding was done at 15 and 30 DAS. Weed density (no./m<sup>2</sup>), weed dry weight (g/m<sup>2</sup>) were recorded at 20, 40 DAS and at harvest.

### RESULTS

Predominant weed species found in experimental site were *Digitaria sanguinalis*, *Dinebra arabica* (grasses), *Cyperus rotundus* (sedge) and *Parthenium hysterophorus*, *Amaranthus viridis* (broad leaf weeds). Application of imazethapyr resulted in significantly lower weed population and higher weed control efficiency (WCE) at all the growth stages of green gram compared to control.

Application of imazethapyr alone 75g/ha resulted in significantly higher weed control at 20 DAS but was on par with 50 g/ha and 62.5 g/ha applied at 40 DAS. Addition of adjuvant 2ml/l resulted in significantly lower weed density, WDM and higher WCE at 20 and 40 DAS compared to the lone application of imazethapyr at the same dose. WCE recorded with 62.5 g/ha imazethapyr + adjuvant was superior to imazethapyr sole application at 75 g/ha, which indicated enhanced imazethapyr efficacy with addition of MSO adjuvant. This will help in reducing the herbicide dose and consequent phytotoxicity on the crop and lower herbicide load on the environment. Weed density, WDM and WCE recorded in 62.5 and 75 g/ha imazethapyr + adjuvant treatments were statistically at par with each other at 20 and 40 DAS. Using the pendimethalin alone could provide weed control only upto 25-30 DAS beyond which poor WCE was recorded. Quizalofop application resulted in only grass weed control and poor BLW weed control during subsequent crop growth stages. Similar observations in green gram due to weed competition were earlier reported by Parasuraman (2000).

**Table 1. Effect of post-emergence application of imazethapyr 10 % SL on weeds and yield of green gram during *Kharif* 2013**

Treatment	Weed density (no/m <sup>2</sup> )		Weed dry matter (g/m <sup>2</sup> )		Weed control efficiency (%)		Seed yield (kg/ha)	Net returns (₹/ha)	B:C ratio
	20DAS	40DAS	20DAS	40DAS	20DAS	40DAS			
Imazethapyr 10%SL 50 g/ha	4.86 (22.70)	4.55 (19.70)	5.14 (25.42)	5.44 (28.57)	40.26	53.10	666	10,527	1.5
Imazethapyr 10% SL 62.5 g/ha	4.63 (20.50)	4.45 (18.80)	4.89 (22.96)	5.31(27.26)	46.05	55.24	714	11,638	1.6
Imazethapyr 10% SL 75 g/ha	4.16 (16.30)	4.29 (17.40)	4.39 (18.26)	5.12(25.23)	57.11	58.57	802	13,897	1.6
Imazethapyr 10% SL 50 g/ha + MSO adjuvant 2ml/l of water	4.58 (20.00)	4.43 (18.60)	4.84 (22.40)	5.29(26.97)	47.37	55.71	694	11,537	1.6
Imazethapyr 10%SL 62.5 + MSO adjuvant 2ml/l of water	3.83 (13.70)	3.62 (12.10)	4.02 (15.14)	4.31(17.55)	64.40	71.19	1073	27,593	2.3
Imazethapyr 10% SL 75 g/ha +MSO adjuvant 2ml/l of water	3.74 (13.00)	3.59 (11.90)	3.96 (14.66)	4.26(17.26)	65.55	71.67	1034	24,122	2.1
Quizalofop - ethyl 5% EC 50 g/ha	4.36 (18.00)	4.81 (22.20)	4.60 (20.16)	5.75(32.19)	52.63	47.14	608	6,868	1.3
Pendimethalin 30%EC 1000 g/ha as PE	3.27 (9.70)	5.21 (26.20)	3.44 (10.86)	6.24(37.99)	74.47	37.62	464	1,437	1.1
Weed free check (MW at 20 and 40 DAS)	2.23 (4.00)	2.77 (6.70)	2.34 (4.48)	3.27 (9.72)	89.47	84.05	934	1,8187	1.8
Control	6.24 (38.00)	6.56 (42.00)	6.60 (42.56)	7.85(60.90)	0.00	-	406	827	1.0
LSD (P=0.05)	0.30	0.30	0.26	0.46	-	-	41.56	-	-

Original values are given in parentheses, which were transformed to “ x+1, DAS : Days after sowing,

Highest grain yield (1.07 t/ha) was recorded in imazethapyr 10% SL + MSO adjuvant 2ml/L of water applied at 62.5 g/ha followed by imazethapyr 10% SL + MSO adjuvant 2ml/l of water applied at 75 g/ha. Yield recorded in all the imazethapyr treatments (sole application), quizalofop and pendimethalin were significantly inferior to imazethapyr 10% SL + MSO adjuvant 2 ml/l of water applied at 62.5 g/ha.

Highest net returns (Rs. 27593/ha) and B:C ratio (2.3) were recorded in imazethapyr 10% SL + MSO adjuvant 2 ml/l of water applied at 62.5 g/ha.

### REFERENCES

Parasuraman P. 2000. Title of the research paper is missing. *Indian Journal of Agronomy* 45(4):732