



## RESEARCH PAPER

# Evaluation of efficacy of post - emergence herbicides for weed control in soybean under Marathwada region

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**Abstract :** An investigation was undertaken to evaluate the efficacy of post emergence herbicides for weed control in soybean under Marathwada region at department of Agronomy, Marathwada Agricultural University, Parbhani during the *Kharif* season of the year 2010. Highest number of pods plant<sup>-1</sup> (40.62), number of grains pod<sup>-1</sup> (2.22), seed weight plant<sup>-1</sup> (12.18g), 100 seed weight (13.50 g), seed yield (2888 kg ha<sup>-1</sup>) and straw yield (3570 kg ha<sup>-1</sup>) were recorded in treatment (T<sub>10</sub>) weed free check (2 HW+2 hoeing at 3<sup>rd</sup> and 5<sup>th</sup>WAS). Followed by pendimethalin PE @ 750 g a.i.ha<sup>-1</sup>+1 HW at 30 DAS, number of pods plant<sup>-1</sup> (38.66), number of grains pod<sup>-1</sup> (2.18), seed weight plant<sup>-1</sup> (10.53g), 100 seed weight (12.50g), seed yield (2820 kg ha<sup>-1</sup>) and straw yield (3503 kg ha<sup>-1</sup>). Amongst the post-emergence herbicides treatment (T<sub>8</sub>) imazethapyr POE @75 g a.i.ha<sup>-1</sup> at 21 DAS recorded highest number of pods plant<sup>-1</sup> (38.25), number of grains pod<sup>-1</sup> (2.14), seed weight plant<sup>-1</sup> (09.86g), 100 seed weight (12.05g), seed yield (2705 kg ha<sup>-1</sup>) and straw yield (3416 kg ha<sup>-1</sup>) as compared to other herbicidal treatments.

**Key Words :** Soybean, Post emergence, Weeds control

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## INTRODUCTION

Soybean (*Glycine max* L.), otherwise known as a 'miracle crop' with over 40 per cent protein and 20 per cent oil, originated in China. Soybean has been accredited as principle food crop since long time that produces 2-3 times more high quality protein yield per hectare than other pulses and cholesterol free oil. It is a multipurpose crop used for making soymilk, soya paneer, soya yogurt, soya ice-cream, soya flour, soya fortified foods staffs and biscuits have good acceptability among the people because of economical and nutritional advantages.

Moreover, it is widely used in oil production in India. Madhya Pradesh, Maharashtra and Rajasthan together contribute about 97 per cent to total area and 96 per cent production of soybean in the country (Jain and Kumar, 2011). The productivity of soybean in Marathwada region is found low as compared to Maharashtra state. One of the limiting factors for low yield was found to be weed competition. Weeds are known to compete with cultivated crops for water, light, nutrients, space and quality of crop produce. Muzik (1979) and Rao (1987) reported 76 per cent losses in soybean yield due to weed infestation in India. The effective and

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economical weed control may not be possible through manual or mechanical means every time due to heavy and continuous rainfall in *Kharif*, aberrant weather condition and labour shortages. Post-emergence herbicides may be applied as per need of time and place, saving time, money and labour. Therefore, there is a need of testing new post-emergence herbicides which have broader spectrum of activity (Kumar *et al.*, 2008). So keeping these facts in view, an attempt was made in study to evaluate efficacy of post emergence herbicides for weed control in soybean under Marathwada region.

## MATERIAL AND METHODS

The field experiment was conducted during *Kharif* season of the year 2010 at the Agronomy Farm, Marathwada Agricultural University, Parbhani. Soil of the experimental field was black and clayey in texture. The experiment was laid out in Randomized Block Design (RBD) with twelve treatments replicated three times. Allocation of treatment at each plot in each replication was done by randomization. The plot size was 4.8 m x 4.5 m and seeds were sown at 45 x 05 cm distance. The yield parameters for evaluating efficacy of post-emergence herbicides and other weed control treatments were studied in all 12 treatments that is number of pods

plant<sup>-1</sup>, number of grains pod<sup>-1</sup>, seed weight plant<sup>-1</sup>, 100 seed weight, seed yield kg ha<sup>-1</sup> and straw yield kg ha<sup>-1</sup>. These observations recorded in 5 plants of each treatment per plot in each replication and there average mean values were used for statistical analysis.

## RESULTS AND DISCUSSION

Data presented in Table 1 revealed that the treatment (T<sub>10</sub>) weed free check (2 HW + 2 hoeing at 3<sup>rd</sup> and 5<sup>th</sup> WAS) recorded highest number of pods plant<sup>-1</sup> (40.62) which was at par with (T<sub>9</sub>) pendimethalin PE @ 750 g a.i. ha<sup>-1</sup>+1HW at 30 DAS and treatment (T<sub>8</sub>) imazethapyr POE @ 75 g a.i. ha<sup>-1</sup> at 21 DAS (38.25). Minimum number of pods plant<sup>-1</sup> were recorded in treatment (T<sub>12</sub>) weedy check (28.62). The relevant data recorded on number of grains pod<sup>-1</sup> and 100 seed weight of various weed control treatments revealed that the effect of different weed control treatments on number of grains pod<sup>-1</sup> and 100 seed weight was found to be non-significant. However, it was observed numerically higher in treatment (T<sub>10</sub>) weed free check (2.22 and 13.50 g) followed by (T<sub>9</sub>) pendimethalin PE @ 750 g a.i. ha<sup>-1</sup>+1HW at 30 DAS and lowest in treatment weedy check (1.98 and 10.30 g). Data on seed weight plant<sup>-1</sup> (g plant<sup>-1</sup>) as affected by different weed control treatments

**Table 1 : Yield attributing characters influenced by different treatments**

Treatments	Number of pods plant <sup>-1</sup> at harvest	Number of grains pod <sup>-1</sup>	Seed weight plant <sup>-1</sup>	100 seed weight	Seed yield (kg ha <sup>-1</sup> )	Straw yield (kg ha <sup>-1</sup> )
T <sub>1</sub> - Trifluraline POE @ 125 g a.i. ha <sup>-1</sup> at 15 DAS	33.87	2.09	8.04	11.36	2318	3076
T <sub>2</sub> - Trifluraline POE @ 150 g a.i. ha <sup>-1</sup> at 15 DAS	34.97	2.11	8.41	11.40	2364	3276
T <sub>3</sub> - Propaquizafop POE @ 625 g a.i. ha <sup>-1</sup> at 10-12 DAS	30.61	2.02	6.81	11.02	2305	3012
T <sub>4</sub> - Fenaxaprop-P-ethyl POE @ 75 g a.i. ha <sup>-1</sup> at 10-12 DAS	31.57	2.07	7.18	11.00	2328	2907
T <sub>5</sub> - Chlorimuron ethyl POE @ 12 g a.i. ha <sup>-1</sup> at 10-12 DAS	34.97	2.10	8.40	11.46	2441	3189
T <sub>6</sub> - Quisqualofop ethyl POE @ 40 g a.i. ha <sup>-1</sup> at 10-12 DAS	36.12	2.09	8.47	11.10	2471	3134
T <sub>7</sub> - Tank mix (Quisqualofop ethyl POE @ 40 g a.i. ha <sup>-1</sup> + chlorimuron ethyl POE @ 12 g a.i. ha <sup>-1</sup> ) at 20 DAS	37.13	2.12	9.33	11.86	2690	3325
T <sub>8</sub> - Imazethapyr POE @ 75 g a.i. ha <sup>-1</sup> at 21 DAS	38.25	2.14	9.86	12.05	2705	3416
T <sub>9</sub> - Pendimethaline PE @ 750 g a.i. ha <sup>-1</sup> + 1 HW at 30 DAS	38.66	2.18	10.53	12.50	2820	3503
T <sub>10</sub> - Weed free check (2 HW + 2 Hoeing) at 3 <sup>rd</sup> and 5 <sup>th</sup> WAS	40.62	2.22	12.18	13.50	2888	3570
T <sub>11</sub> - Farmers practice (1 HW + 1 Hoeing) at 30 DAS	37.00	2.12	9.25	11.80	2510	3296
T <sub>12</sub> - Weedy check	28.62	1.98	5.83	10.83	1746	2700
S.E. ±	0.83	0.22	0.62	0.70	87.67	51.53
C.D (P=0.05)	2.44	NS	1.83	NS	264.74	153.92
General mean	35.19	2.10	8.69	11.61	2465	3200

NS= Non-significant

revealed that treatments differed significantly in respect of seed weight plant<sup>-1</sup>. The treatment (T<sub>10</sub>) weed free check (2 HW + 2 hoeing at 3<sup>rd</sup> and 5<sup>th</sup> WAS) recorded more seed weight plant<sup>-1</sup> (12.18g plant<sup>-1</sup>) which was at par with treatment (T<sub>9</sub>) pendimethalin PE @ 750 g a.i. ha<sup>-1</sup> + 1 HW at 30 DAS (10.53 g) and significantly lowest seed weight plant<sup>-1</sup> recorded by treatment weedy check (5.83 g). Treatment (T<sub>10</sub>) weed free check (2 HW + 2 hoeing at 3<sup>rd</sup> and 5<sup>th</sup> WAS) recorded highest seed yield and straw yield (2888 and 3570 kg ha<sup>-1</sup>) However, it was found at par with (T<sub>9</sub>) pendimethalin PE @ 750 g a.i. ha<sup>-1</sup> + 1 HW at 30 DAS (2820 and 3503 kg ha<sup>-1</sup>), (T<sub>8</sub>) Imazethapyr POE @ 75 g a.i. ha<sup>-1</sup> at 21 DAS and (T<sub>7</sub>) tank mix (Quizalofop ethyl POE @ 40 g a.i. ha<sup>-1</sup> + chlorimuron ethyl POE 12 g a.i. ha<sup>-1</sup>) at 20 DAS and significantly superior over rest of the treatments. The treatments (T<sub>12</sub>) i.e. weedy check recorded significantly lowest seed and straw yield (1746 and 2700 kg ha<sup>-1</sup>). These results are in confirmation with Chhokar *et al.* (1996 and 1997); Jain *et al.* (1985); Reddy *et al.* (2003) and Rammoorthy *et al.* (1995). Study on evaluation of post-emergence herbicides for weed control in soybean revealed that, the treatment (T<sub>8</sub>) Imazethapyr POE @ 75 g a.i. ha<sup>-1</sup> at 21 DAS were recorded highest number of pods plant<sup>-1</sup> (38.25), number of grains pod<sup>-1</sup> (2.14), seed weight plant<sup>-1</sup> (9.86g), 100 seed weight (12.05 g), seed yield (2705 kg ha<sup>-1</sup>) and straw yield (3416 kg ha<sup>-1</sup>) which was followed by treatment T<sub>7</sub> tankmix (Quizalofop ethyl POE @ 40 g a.i. ha<sup>-1</sup> + chlorimuron ethyl POE 12 g a.i. ha<sup>-1</sup>) at 20 DAS that is number of pods plant<sup>-1</sup> (37.13), number of grains pod<sup>-1</sup> (2.12), seed weight plant<sup>-1</sup> (9.33g), 100 seed weight (11.86 g), seed yield (2690 kg ha<sup>-1</sup>) and straw yield (3325 kg ha<sup>-1</sup>) and minimum observations on above yield parameters were recorded in treatments (T<sub>3</sub>) propaquizafop POE @ 625 ga.i ha<sup>-1</sup> at 10 to 12 DAS. From the present investigation, it was observed that most of the yield parameters were found at par in treatment (T<sub>9</sub>) pendimethalin PE @ 750 g a.i. ha<sup>-1</sup> + 1 HW at 30 DAS and treatment (T<sub>8</sub>) imazethapyr POE @ 75 g a.i. ha<sup>-1</sup> at 21 DAS with superior treatment (T<sub>10</sub>) weed free check (2 HW + 2 hoeing at 3<sup>rd</sup> and 5<sup>th</sup> WAS). Almost similar results were reported by Balyan and Malik (2003). Thus, chemical weed control were found relatively

effective as compared with weed free check.

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