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Yield and weed dynamics of Wheat (*Triticum aestivum* L.) influenced by post emergence herbicides

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ABSTRACT
A field experiment was carried out at college of Agriculture, Malegaon camp using Randomize block design with three replications during Rabi 2016-17 and 2017-18 to evaluate the effect of post emergence herbicides on wheat. The study comprises of different six weed management methods as treatments. The predominance weed of the experiment field during the season in wheat were Cyperus rotundus, Parthenium hystoriphorus, Tridex procumbens, Amaranthus viridis, Alternet heraechinata and Euphorbia hirta. The data showed that all weed control treatments brought out significant effect on weed population and dry weight of weeds. Treatment T_3 (Metsulfuron-methyl 20% WP) recorded significantly lowest weed count, weed dry weight and higher weed control efficiency. All weed control treatments significantly enhanced the grain and straw yield of wheat over weedy check.Significantly higher grain yield was obtained from treatment T_5 (HW at 20 and 40 DAS). Significantly higher straw yield was obtained from treatment T_3 (Metsulfuron-methyl 20% WP) over rest of the treatments.
Keywords: *Weed, yield, wheat and herbicides*

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INTRODUCTION

Wheat *(Triticum aestivum L.)* is an important cereal crop of a large number of countries in the world and provides about 20% of total food calories for the human race [1, 2]**.** In India it is the second important staple food crop, rice being the first. The irrigated wheat is infested with several Broad leave weeds which create competitive stress resulting in yield losses is verying from 07 to 50% depending upon their density. At present, 2,4-D as post emergence is effective herbicide to control the BLW's in wheat, but has sown little control of several non grassy weeds. Therefore, there is urgent need to have alternative herbicide which may provide wide range of weed control. In this direction, some new herbicides were tried alone to find out their efficacy.

MATERIAL AND METHODS

Present investigation was carried out at Agricultural college farm, HH SS MS college of Agriculture, Malegaon (MH) during *Kharif* 2016-17 and 2017-18 to find out effectiveness of post emergence herbicides in wheat. The experiment was conducted on vertisols, in a randomized block design with 06 treatments. The gross and net plot sizes were 5.00 x 4.00 and 4.00 x 3.55 m, respectively. Wheat variety PhuleSamadhan was grown as test crop with row to row 22.5 cm spacing. The total rainfall of 1160.3 and 1280.8 mm were received during the 2016-17 and 2017-18 years, respectively. The average maximum temperature for different months varied from 24^0C to 45^0C, while monthly average minimum

temperature ranged between 22.9^{0}C to 38.8^{0}C. The observation on yield weed density, WDW, WFW were recorded, computed and were subjected to statistical analysis.

RESULTS AND DISCUSSION

Grain and straw yields

The grain yield of wheat was found significantly affected during both years due to weed management treatments and the data are furnished in Table 1. Application of treatment T_5 (HW @ 20 and 40 DAS) recorded significantly higher grain yield (39.13 and 35.68 q ha^{-1}) during the year 2016-17 and 2017-18, respectively. Treatment T_5 (HW @ 20 and 40 DAS) was also found at par with treatment T_1 (2,4 –D 38% EC) andT_2 (2,4-D 58 % SL)and T_3 (Metsulfuron-methyl 20 WP), T_1(2,4-D 58 %SL) andT_2(2,4-D 58 %SL)during the year 2016-17 and 2017-18, respectively.

Application of T_3 (Metsulfuron-methyl 20 WP) recorded significantly higher straw yield i.e. 71.71 and 10.26 q ha^{-1}, respectively during the years 2016-17 and 2017-18 over rest of the treatments.

Table 1: The grain yield of wheat found significantly affected during both years due to weed management treatments

	Grain Yield (q ha^1)		**Straw Yield (q ha^1)**		**WEED COUNT at harvest (m^2)**		**WDW m^2 at harvest (g)**		**WCE (%)**		**WI (%)**	
Year/ Tret.	**2016-17**	**2017-18**	**2016-17**	**2017-18**	**2016-17**	**2017-18**	**2016-17**	**2017-18**	**2016-17**	**2017-18**	**2016-17**	**2017-18**
T1	34.15	36.06	67.3	69.33	27.68	24.45	3.72	3.53	49.60	64.20	12.72	7.35
T2	35.28	32.28	65.43	67.61	39.55	36.43	4.11	4.25	50.77	61.99	9.84	17.08
T3	36.83	38.93	**71.71**	**70.26**	**1.13**	**1.64**	**0.085**	**1.125**	**99.06**	**89.99**	5.88	8.35
T4	33.46	29.59	66.58	67.98	45.62	37.57	4.305	4.565	48.37	59.46	14.49	23.99
T5	**39.13**	**35.68**	68.28	69.20	2.58	1.88	0.2175	1.4	97.39	87.78	**0.00**	**0.00**
T6	29.83	28.20	64.063	61.85	58.49	58.43	8.4375	58.425	00.00	00.00	23.76	27.55
CD	**4.95**	**4.62**	**8.57**	**8.26**	**4.48**	**3.54**	**0.59**	**1.92**	**5.26**	**4.78**	**NS**	**NS**

Weed dynamics

All the treatments registered significantly lower number of weeds and total dry matter production than weedy check treatment. The Treatment T_3 (Metsulfuron-methyl 20 WP) recorded least weed count (1.13 and 1.64) during the years 2016-17 and 2017-18 than remaining treatments, but was found at par with T_5 (HW @ 20 ad 40 DAS) with 2.58 and 1.88 during 2016-17 and 2017-18, respectively.WDW m^2 at harvest were found significant in both the years. Significantly lower weed dry weights (0.085 and 1.125) were observed in T_3 and it was at par with T_5 during both the years. In case of the weed control efficiency all the methods of weed control was lowering the weed biomass, but T_3 (Metsulfuron-methyl 20 WP) recorded maximum weed control efficiency (99.06 and 97.39%) during the years 2016-17 and 2017-18, respectively. However treatment T_5 was remained at par with treatments T_5 (89.66 and 87.78%) in the year 2016-17 and 2017-18, respectively.Non significantresult were observed in case of the weed index during both of the years.

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