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Response of weed management practices in the field of wheat (*Triticum aestivum*) crops

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ABSTRACT

The present investigation entitled “To study the effect of weed management practices in the field of wheat (*Triticum aestivum*) crops.” was conducted at Agronomy Research Farm, Rama University Mandhana, Kanpur (U.P.) during Rabi season of 2021-22. The experiment was laid out in Randomized block design with three replications keeping eight weed management practices Prosulfocarb 80 EC (PE) 1600 ml/ha, Prosulfocarb 80 EC (PE) 2000 ml/ha, Prosulfocarb 80 EC (PE) 3000 ml/ha, Sulfosulfuron @ 25g/h, clodinafop +Metsulfuron @ 60+4 gm.a.i./ha, Sulfosulfuron + Metsulfuron @ 30+4 gm.a.i./ha, Weed free up to 60 days, Weedy Check. Results revealed that among weed management practices weed free followed by Sulfosulfuron (30g) + metsulfuron (4g) a.i ha⁻¹ proved as superior than other treatments with respect to higher crop growth and yield attributes whereas weed density, dry weight, initial plant population, plant height, no of tillers and yield attributes. Maximum gross return and cost of cultivation was found with weed free treatment combination. While maximum net return was found with Sulfosulfuron (30g) + metsulfuron (4g) a.i ha⁻¹. Maximum B:C ratio was obtained in combination of Sulfosulfuron (30g) + metsulfuron (4g) a.i ha⁻¹. The planting was done on 4th december 2021. Among the various weed management treatments Sulfosulfuron (30g) + metsulfuron (4g) a.i ha⁻¹ recorded highest B:C ration and yield.

Keywords: Weed management, Wheat, Herbicides

Introduction

As per Second Advance Estimates for the agriculture year 2022-23, the Wheat production in the country is estimated at 112.18 million tons which is higher by 4.44 million tons than the production achieved during 2021-22. The Wheat Market size is forecast to increase by USD 73.16 billion, at a CAGR of 4.54% between 2023 and 2028. The market is influenced by several key factors, including the expanding vegan population, the rising adoption of healthy eating habits, cultured wheat and the increasing global production of wheat-based items. It is the second largest producer of rice, wheat, cotton, sugarcane, farmed fish, sheep & goat meat, fruit, vegetables and tea. The country has some 195 m ha under cultivation of which some 63 percent are raifed (roughly 125m ha) while 37 percent are irrigated (70m ha). India's wheat production is projected to reach 111.32 million tons in 2023-24, up from 109.52 million tons in 2022-23, reflecting a compound annual growth rate (CAGR) of 1.64%.

Soil degradation, water scarcity, and declining farm profitability further exacerbate the sustainability concerns associated with wheat cultivation by AllIndiaWheatSurveyReport2023-2024. In agriculture weed causes more damage compared to insects, pests and diseases but due to hidden loss by weed in crop production, it has not drawn much attention of agriculturists (Rao, 2001) [1]. Weeding at an early stage of crop growth in wheat is a very important practice because heavy infestation of weeds hampers the crop growth as well as greater reduction in wheat yield. Slow growth of wheat plants during the early growth stage provides specific conditions for the growth of various weed flora at the time of germination and also subsequent growth periods. Herbicides on account of their selectivity are the most important tools in weed management to sustain yield and quality of crop (Mitra et al., 2019) [2]. The prominent weeds noted in wheat field are *Phalaris minor*, *Cyperus rotundus*, *Cynodon dactylon*, *Chenopodium album*, *Anagallis arvensis*, *Avena fatua*, *Convolvulus arvensis* and *Lathyrus* spp. etc., which alone causes 33 percent reduction in wheat yield, Rice-Wheat is one of the most important cropping systems in the northern part of the country stretches from Jammu plains to lower Assam having an area about 10.8 m ha. The cultivators are not aware of proper dose of herbicides, time of application, economics and their persistence in the soil. Several selective herbicides are available in the market, which are treated to be effective for particular crops. The farmers have to make decisions about the selection of the right type of herbicides.

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Materials and Methods

The particulars of experimental material used and techniques adopted during the course of investigation entitled “Bio-efficacy of new herbicide (prosulfocarb) against weeds specially phalaris *minor* in wheat crop (*Triticum aestivum* L.)” are described in this chapter. Field experiment was carried out during rabi season of 2021-22 at Agriculture Research Farm Rama University, Mandhana Kanpur (U.P). The treatments were laid out in Randomized Block Design (RBD) being weed-management practices (8) with three replications and the basic principles of randomization were followed. In order to determine the physio-chemical characteristics of the soil and fertility status, the soil

samples were collected at random from 10 places of the experimental field with the help of soil auger to a depth at 0-15 cm. The collected soil samples were mixed together and a composite sample was drawn and analyzed in the laboratory for physio chemical properties.

Result and Discussion

Initial plant population

The data pertaining to initial plant population was recorded at 15 DAS and Plant height presented in Table.1. It clearly reveals that different weed control treatments did not influence significantly.

Table 1. Initial plant population and plant height affected by different weed management practices.

Treatment	Initial plant population (m ⁻²)	Plant Height	
		30 DAS	90 DAS
Prosulfocarb80EC(PE)1600 ml.a.i./ha	121	21.07	68.65
Prosulfocarb80EC(PE)2000 ml.a.i./ha	123	22.07	71.14
Prosulfocarb80EC(PE)3000 ml.a.i./ha	122	22.22	72.5
Sulfosulfuron@25g.a.i./ha(POE)	120	23.07	74.43
Clodinafop+Metsulfuron@60g+4ga.i./ha(POE)	122	23.77	78.91
Sulfosulfuron+Metsulfuron@30g+4a.i./ha(POE)	123	24.1	81.35
Weed freeup to 25-50DAS	121	25.07	87.71
Weedy check till maturity	123	20.67	60.71
SEm±	1.04	0.93	1.42
CD(P = 0.05)	NS	NS	4.33

At 30 days' stage, weed free up to 25-50 days recorded the non-significantly tallest plant followed by post-emergence spray of Clodinafop + Metsulfuron @ 60g+4g a.i./ha (POE). Among the post-emergence herbicide, application of sulfosulfuron + metsulfuron @ (60+4) recorded slightly higher plant height (24.10 cm) followed by Clodinafop + Metsulfuron @ 60g+4g a.i./ha (POE) 23.77 cm. The data recorded highest under the treatment sulfosulfuron + metsulfuron @ (60+4) are 24.10 followed by Clodinafop + Metsulfuron @ 60g+4ga.i./ha (POE) 23.77. The herbicide treatment application of sulfosulfuron + metsulfuron @ (60+4) recorded significantly more plant height 24.1 cm and 81.35 cm over prosulfocarb at the rate of 2000 ml & prosulfocarb 1600 ml at 30 days and 90 days.

Among the prosulfocarb treatment pre-emergence spray of prosulfocarb 2000 ml/ha recorded non-significantly more height followed by prosulfocarb 3000 ml/ha. A similar higher value of crop growth was recorded by Pandey *et al.* (2007) [3], Meena *et al.* (2011) [4]. **Dry matter accumulation:**

Data regarding the effect of various weed management methods on dry matter accumulation in wheat is presented in the table. 2. Across all treatments, dry matter accumulation increased continuously from 30 DAS to 90 DAS. At 30 DAS, dry matter accumulation ranged from 1.85 to 2.62 g m⁻², with the highest value (2.62 g m⁻²) recorded in the weed-free treatment. Among the herbicidal treatments, the highest dry matter accumulation (2.43 g m⁻²) was recorded with post-emergence (POE) application of sulfosulfuron + metsulfuron (30 + 4 g a.i. ha⁻¹), followed by clodinafop + metsulfuron (60 + 4 g a.i. ha⁻¹) (2.36 g m⁻²). The lowest dry matter accumulation was observed in the weedy check (1.85 g m⁻²). However, the differences between treatments at 30 DAS were not significant, as indicated by the non-significant (NS) CD (*P* = 0.05) value. At 90 DAS, dry matter accumulation increased substantially, ranging from 15.17 to 22.17 g m⁻². The

highest dry matter accumulation was recorded in the weed-free treatment (22.17 g m⁻²), followed by sulfosulfuron + metsulfuron (20.55 g m⁻²) and clodinafop + metsulfuron (19.94 g m⁻²). Applications of prosulfocarb 80 EC at rates of 1600, 2000, and 3000 ml a.i. ha⁻¹ resulted in dry matter accumulation of 17.35, 17.98, and 18.33 g m⁻², respectively. The lowest value was recorded in the weed-infested check (15.17 g m⁻²). A CD (*P* = 0.05) value of 1.40 g m⁻² indicated that the treatments significantly influenced dry matter accumulation at 90 DAS. The higher dry matter accumulation observed in weed-free and effective herbicide treatments can be attributed to reduced weed competition for light, moisture, nutrients, and space, leading to enhanced crop growth and biomass production. Conversely, where weeds were not removed, their continued presence stunted crop growth and resulted in lower dry matter accumulation. Similar findings regarding improved crop growth and dry matter production through effective weed management in wheat have been reported by Chopra *et al.* (2008) [5] and Mahajan *et al.* (2012) [6]. The present results also align with the general consensus that early removal of weeds during the critical period of crop-weed competition alleviates competition, thereby resulting in greater biomass accumulation. Similarly, efficient control of weed.

Lower crop weed competition to crop and higher availability of plant nutrient to crop under herbicide applied in combination resulted in higher plant growth in terms of dry matter accumulation as compared to herbicide applied alone which having poor efficiency to control weed resulted in lower growth attributes. Higher crop weed competition due to higher weed population and dry weight of weed resulted in poor availability of nutrients to crop causing poor dry matter accumulation. A similar higher value of dry matter accumulation of crops was recorded by Pal *et al.* (2012).

Treatment	Dry Matter Accumulation (gm ⁻²)	
	30 DAS	90 DAS
Prosulfocarb80EC(PE)1600 ml.a.i./ha	2.05	17.35
Prosulfocarb80EC(PE)2000 ml.a.i./ha	2.12	17.98
Prosulfocarb80EC(PE)3000 ml.a.i./ha	2.17	18.33
Salfoslfuron@25g.a.i./ha(POE)	2.22	18.81
Clodinopop+Metsulfuron@60g+4ga.i./ha(POE)	2.36	19.94
Sulfosulfuron+Metsulfuron@30g+4a.i./ha(POE)	2.43	20.55
Weed free up to 25-50DAS	2.62	22.17
Weedy check till maturity	1.85	15.17
SEm±	0.12	0.46
CD(P = 0.05)	NS	1.40

Conclusion

The results of experiments conducted at Agronomy research farm Rama University Mandhana Kanpur (U.P.) during 2021-22 conducted that to ensure maximum grain yield and remuneration from wheat. Weed free found no-significant at the stage of initial plant population and 30 DAS, but latter stage of the growth of plant at the stage of 90 DAS among the treatment Sulfosulfuron + Metsulfuron (30 + 2 g ha⁻¹) (81.35 cm) found significant effect on crop growth followed by clodinafop + Metsulfuron (60+4) g/ha (78.91) at 90 DAS stage. Highest plant heights were recorded under the weed free plot while minimum plant height under weedy check treatment. Weed free found most effective to dry matter accumulation.

Among the herbicide post emergence application of Sulfosulfuron + Metsulfuron (30+4) gm.a.i./ha which was found to be the most effective weed control.

References

1. Rao VS. Principles of weed science. New Delhi: Oxford and IBH Publishing Co.; 2001. p. 2-3.
2. Mitra B, Barman R, Mondal T. Control of broad-leaved weeds in wheat under eastern sub-Himalayan plains. *Indian Journal of Weed Science*. 2019;51(1):27-31.
3. Pandey IB, Dwedi DK, Pandey RK. Efficiency of herbicide and fertilizer management on weed dynamics in wheat (*Triticum aestivum*). *Indian Journal of Agronomy*. 2007;52(1):49-52.
4. Meena RS, Singh MK. Weed management in late sowing zero-till wheat (*Triticum aestivum*) with varying seed rate. *Indian Journal of Agronomy*. 2011;56(2):127-132.
5. Chopra NK, Angiras NN. Effect of post-emergence herbicides on weed control and productivity of wheat (*Triticum aestivum* L.). *Indian Journal of Weed Science*. 2008;40:23-26.
6. Mahajan G, Chauhan BS, Johnson DE. Weed management in wheat using herbicides and crop competition. *Crop Protection*. 2012;35:114-119.
7. Rana L, Banerjee H, Ray K, Sarkar S. System of wheat intensification (SWI) – A new approach for increasing wheat yield in a small holder farming system. *Journal of Applied and Natural Science*. 2017;9(3):1,453-1,464.
8. Singh S, Singh K, Punia SS, Yadav A, Dhawan RS. Effect of stage of phalaris minor on the efficacy of accord plus (Fenoxaprop + Metsulfuron+ ready mix). *Indian Journal of weed science*. 2011;43(1&2):23-31.
9. Singh S, Punia SS, Malik RK. Interaction of water temperature for spraying clodinafop formulation on phalaris minor biotype. *Indian Journal of weed science*. 2010;42:44-51.

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