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Effect of weed management practices on weeds and productivity of wheat (*Triticum aestivum* L.)

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Abstract

There were 12 systems for discarding weeds, for instance, T1-Sulphosulfuron 25 g a.i. ha⁻¹, T2-Metsulfuron 4 g a.i. ha⁻¹, and T3-Clodifop. 60 g of T4-Metribuzin, the solid point in ha⁻¹, 210 g of T5-Sulphosulfuron + Metsulfuron (30+2), the astounding part per hectare, 32 g of T6-Sulphosulfuron + Metribuzin (25+210) is the fundamental region per ha⁻¹. 235 g a.i. ha⁻¹, T7-Clodifop+Metsulfuron (60+4) 64 grams of the exceptional fixing per hectare 120 g ha⁻¹ T8-Fenoxaprop-p-ethyl, 120 g ha⁻¹ T9-Fenoxaprop-p-ethyl, and 4 g ha⁻¹ Metsulfuron. 124 g of dynamic fixing ha⁻¹, T10 — two hand pickings at 20, 40 DAS, Outing for trees, says T₁₁. There are none, says T₁₂. Mix T7Clodifop and Metsulfuron herbicides @ (60+4) The best arrangement for controlling how much weeds, their dry weight, how well they were controlled, and how much weeds there that were was seen as 64 g a.i. ha⁻¹. This was rough from T5-Sulphosulfuron + Metsulfuron @ (30+2) concerning assessments. 32 g a.i. ha⁻¹, and the two fixes were emphatically better stood disconnected from various drugs and about like sans weed. All of the progress records, yield credits, and yield of wheat are fundamentally higher in without weed drugs, yet quantifiably foggy from T7-Clodifop+ Metsulfuron @ (60+4) 64 g a.i. ha⁻¹ and T5-Sulphosulfuron + Metsulfuron @ (30+2) 32 g a.i. ha⁻¹. Under T7-Clodifop + Metsulfuron at (60+4) 64 g a.i. ha⁻¹, the benefit cost degree was 2.04 and the net return was 81054.50 Rs. Along these lines, it might be proposed as a potential improvement for discarding bugs.

Keywords: Metsulfuron, foggy, Fenoxaprop-p-ethyl

Introduction

After rice, the chief yield for food is wheat (*Triticum aestivum* L.). It makes up 36.2% of the food holder for the country. It can fill in various kinds of soil and climate. Starting with one side of the planet then onto the going with, wheat is made on 215,29 million hectares. Reliably, 730.84 million tons of wheat are made, and every hectare gives 33.90 q ha⁻¹. China, India, and the US empower the going with most wheat on earth after the European Alliance. Individuals beginning with one side of the planet then onto the going with eat an overall level of wheat (667 million tons) that is made. All through late years, as the general individuals has developed, so has its utilization. It ought to appear at 780 million tons in 2020. Between 1966-1967 and 2013-2014, India's wheat region, creation, and adequacy all rose, from 12.8 million ha⁻¹ to 29.65 million ha⁻¹, from 11.4 million tons to 93.5 million tons, and from 887 kg ha⁻¹ to 3153 kg ha⁻¹ (FAO, 2013). There is a ton of wheat filled in the UK (7.9 t ha⁻¹), Germany (7.8 t ha⁻¹), France (7.5 t ha⁻¹), and China (4.7 t ha⁻¹), yet India gets according to a general viewpoint less. Wheat fills in India in a wide variety of agroclimatic conditions and needs to manage a tremendous number from both living things and the climate. Making is enormous in the north-western plain locale of Uttar Pradesh, Punjab, and Haryana. FAO says that the nation becomes 68.29% of its wheat there. Uttar Pradesh has the most land (9.73 million ha) and the most result (30.29 million tons) in India. At any rate, Haryana has the most result (50.30 q ha⁻¹), trailed by Punjab, Rajasthan, and Uttar Pradesh, which each have 48.98 q ha⁻¹, 31.75 q ha⁻¹, and 31.13 q ha⁻¹.

Review of literature

Dodamani and Das (2009) ^[14] said that Phalaris minor, *Avenasterilis* spp., *Ludoviciana*, *Melilotus indica*, Pot sativa, *Anagallis arvensis*, *Cirsium arvense*, *Poa annua*, and *Chenopodium murale* were eating the wheat crop.

Yadav *et al.* (2009) ^[15] saw wheat area and found that Phalaris minor, *Coronopus didymus*, *Anagallis arvensis*, *Melilotus indica*, *Medicago denticulata*, *Rumex denticulatus*, *Vicia sativa*,

and *Lathyrus aphaca* were the most all around saw weeds.

Rahaman and Mukherjee (2009) [16] said that *Polygonum orientale*, *P. minor*, *Eclipta alba*, *Cynodon dactylon*, *Setaria glauca*, and *Digitaria sanguinalis* are the most irrationally totally seen weeds in wheat region.

Khokhar and Nepalia considered in 2010 that 69.28% of the weeds in the wheat crop were wide leaf weeds (*Chenopodium gathering*, *C. murale*, *Coronopus didymus*, *Convolvulus arvensis*, and *Melilotus indica*) and 30% were green weeds. *Phalaris minor* was a tremendous weed found that the wheat crop was being eaten by *Phalaris minor*, *Avena ludoviciana*, *Lolium temulentum*, *Vicia sativa*, *Lathyrus aphaca*, *Stellaria media*, *Coronopus didymus*, *Anagallis arvensis*, *Spergulla arvensis*, and *Polygonum alatum*.

Meena and Singh (2011) found that the most stunning annoys on wheat fields were *Chenopodium system* (26.79%) and *Phalaris minor* (19.17%). *Rumex dentatus* (13.79%), *Avena ludoviciana* (8.79%), *Melilotus alba* (6.39%), *Melilotus indica* (4.79%), *Anagallis arvensis* (4.15%), *Solanum nigrum* (4.15%), *Cynodon dactylon* (3.36%), *Lauene asplenifolia* and *Vicia sativa*.

Singh, and a few others. There were different *Phalaris minor*, *Rumex dentatus*, *Melilotus indicus*, *Chenopodium outline*, and *Launaea nudicaulis* close by.

Chopra and Chopra found in 2010 that spreading 100 g ha⁻¹ of fenoxaprop-ethyl and 60 g ha⁻¹ of Clodinafoppropargyl killed on a particularly vital level green weed. Unequivocally when used all gathered, clodinafop, and metsulfuron cut weed thickness by 90.7% and weed dry matter by 89.8%. This was pondering the way in which the weeds' tangled vegetation was taken note.

Saha and Rao found in 2010 that metsulfuron methyl is a general clear dangerous substance for discarding weeds with titanic leaves that putting 32 g ha⁻¹ of Sulfosulfuron and Metsulfuron on the land completed 90% to 100% of the protected biotype of *Phalaris minor* found that Clodinafop, Sulfosulfuron, Fenoxaprop, Pinpxadin, Mesosulfuron + Iodosulfuron, and all mixes in with Sulfosulfuron all worked sublimely on wide leaf plants, regardless, between pack pay were thought of found that tank mixes of Clodinafop 60 g ha + Metsulfuron 4 g ha⁻¹ and Clodinafop 120 g ha + Metsulfuron 8 g ha⁻¹ with and without 0.2% cleaning expert problematic strong regions for were for strikingly killing weeds.

Lathwal and Ahlawat (2011) said that it was more perplexing to use Sulfosulfuron and Metsulfuron together to discard upsetting weed species than to use Sulfosulfuron alone found that hand weeding and the herbicides 2, 4-D, Metsulfuronmethyl, Sulfosulfuron + Metsulfuron, and Sulfosulfuron + Metsulfuron worked better stood bound from weedy check at hacking down how much weeds and their dry weight.

Sharma and Singh (2011) [8] saw that the best methodology for killing the dry load of weeds was to pull them out by hand twice. This was dangerous from using 25 grams of Sulfosulfuron per part of land.

Singh *et al.* (2011) [8] said that a set up mix of Fenoxaprop + Metribuzin 275 g a.i ha⁻¹ sprinkled on plants with 2-4 leaves killed 90-100% of all *Phalaris minor* social classes that using fenoxaprop-pethyl + Metribuzin at 275 and 330 g ha⁻¹ was convincing at discarding *Phalaris minor* and wide leaf weeds in wheat crops and was quantifiably jumbled from using Mesosulfuron + Iodosulfuron 3.6 WDG on how much dry

matter that *Phalaris minor* and clearing leaf weeds amassed that wheat grain creation dropped by 40.3% when weeds were abandoned to make. Use of Sulfosulfuron 25 g + 2, 4-D 500 g ha⁻¹ reduced weed people and biomass basically and fittingly caused expansion in crop improvement and grain yield of wheat, this was at standard with tank-mix utilization of Clodinafop 6 g + Metsulfuron methyl 2 g ha⁻¹, Isoproturon 750 g + 2, 4-D 500 g ha⁻¹ and Fenoxaprop 120g + Metribuzin 100 g ha⁻¹.

Materials and Methods

The North-Western Plain is a piece of Uttarakhand where Dehradun is found. At figures out 30.31650N, 78.03220E, it is 516.5 meters above ocean level. The test was finished on the Rampur field in Dehradun. Dehradun is around 145 km away from the School.

The land and the climate: The climate and temperature are: It has a warm environment with three unequivocal seasons: wet (June to October), winter (January to Spring), and dry (November to May). With a high of 35 degrees, April, May, and June are the hottest months. The coldest months are November through February, with lows a few spot in the level of 3.5 and 10 degrees or even lower.

Temperature: During the season when wheat makes, the general conventional standard temperature will go from 5.6°C to 27.34 °C in 2021.

How much water that tumbled from the sky or thick in the air as of now is evaluated in millimeters (mm). The tempest measure shows that this is what's going on. There was a level of 210.4 mm of tempest during the making season.

Drenched state (%): This is how much water drops in the air at a specific spot. More than 90% versatility was persistently the most it whenever got.

Arrangements: The plans were various ways to deal with administering sorting out disposing of weeds in wheat crops that were being broke down. After the plants had conveyed for 30 DAS, the harmful substances were totally utilized.

Table 1: Detail of treatments

Symbol	Treatment
T1	Sulfosulfuron @ 25 g a.i. ha ⁻¹
T2	Metsulfuron @ 4 g a.i. ha ⁻¹
T3	Clodinafop @ 60 g a.i. ha ⁻¹
T4	Metribuzin @ 210 g a.i. ha ⁻¹
T5	Sulfosulfuron + Metsulfuron (30+2) @ 32 g a.i. ha ⁻¹
T6	Sulfosulfuron + Metribuzin (25+210) @ 235 g a.i. ha ⁻¹
T7	Clodinafop + Metsulfuron (60+4) @ 64 g a.i. ha ⁻¹
T8	Fenoxaprop -p - ethyl @ 120 g a.i. ha ⁻¹
T9	Fenoxaprop-p-ethyl + Metsulfuron (120+4) @ 124 g a.i. ha ⁻¹
T10	Two hand weeding (20 and 40 DAS)
T11	Weedy check
T12	Weed free

Social Development

The seeds were planted in the Rabi season of 2021-2022. Table 1 records and sorts out the different kinds of social work that are done in the field.

Setting up the field

A wheat yield ought to be watered 7-10 days before it is put with the objective that the field is ready and there is good water for the wheat to team up well. During both making seasons, the field was fallen twice, and a short period of time later a shaper and a few stores were used to make a fair seed bed. Each time, contraptions were pulled by trucks to complete the work. The plots on the outline were then discrete with a stick.

Waste application

The key gather got 120 kg of nitrogen from urea, 60 kg of phosphorus from Di-ammonium phosphate, and 40 kg of potassium from muriate of potash. As a base treatment, 33% of how much nitrogen and everything of phosphate and potassium were used. After the fundamental watering and the start of the panicle stage, the last 66% of the nitrogen region were added on top as urea.

Results and Discussions

How high the plant is (cm)

As the plant made, it became higher, and this was most sure not many spot in that frame of mind of 60 and 90 DAS. It shows that what you discard weeds extraordinarily means for how tall plants get at each season of food making. At each season of secure improvement close by 30 days clearly following planting (DAS), without weed remained on an especially boss level higher than any additional ways of managing coordinating controlling warding weeds off. At 30 DAS, without weed plants were the extraordinarily level as plants that had been weeded by hand with two hands, yet they were still essentially more clear than plants that had been weeded startlingly.

Record of Leaf Locale

Wheat's leaf region report was impacted by weed control structures at each season of progress close by 30 days happening to planting (DAS). At 60 and 90 DAS, without weed had the most head LAI, which was 3.87 and 4.2, which was dull from Clodinafop 60 g ha-1 + Metsulfuron 4 g ha-1, ambiguous from Sulfosulfuron 30 g ha-1 + Metsulfuron 2 g ha-1, and on an astoundingly fundamental level higher than various plans. A blend of 60 grams of Clodinafop and 4 grams of Metsulfuron isn't particularly portrayed from 30 grams of Sulfosulfuron and 2 grams of Metsulfuron. There might have been uncommon water and nourishment for the plants since there were less bugs. This could figure out why these approaches to overseeing regulating arranging focusing on leaf district were better. This was plainly genuine for movement.

How much dry things that are there (g m-2)

How the weeds are made affects how much disperse matter a yield makes to 30 DAS. In later times, every one of the ways of managing overseeing organizing discarding weeds had a gigantic impact in how much dry matter the yield got. The treatment with basically no weeds had the most dry matter at 60, 90, and total, with 370, 798.50, and 1170.47 g m-2, really.

This was tantamount to 60 grams for each hectare of Clodinafop-p-ethyl, 4 grams for every hectare of Metsulfuron, and 30 grams for each hectare of Sulfosulfuron. Genuinely base on weedy at 60 days, 90 days, and at whatever point right at this point is the best a section to pick. At 60 DAS, 90 DAS, and store up stage, Clodinafop-p-ethyl 60 g ha-1 + Metsulfuron 4 g ha-1 was quantifiably better stood detached from various meds, but Sulfosulfuron 30 g ha-1 + Metsulfuron 2 g ha-1 was essentially something fundamentally tangled.

Table 2: shows what different approaches to overseeing managing figuring out discarding weeds mean for the level (cm) of wheat plants at different times after they have been planted.

Treatments			
	Plant height (cm)	Leaf area index	Dry matter
T1	97.64	3.75	1068.66
T2	97.48	3.71	1050.20
T3	95.65	3.58	1028.67
T4	96.85	3.67	1046.54
T5	101.74	4.13	1136.91
T6	97.81	3.77	1086.21
T7	102.36	4.14	1154.31
T8	94.85	3.54	1015.39
T9	99.74	3.95	1087.81
T10	101.37	4.14	1132.43
T11	87.4	3.14	806.42
T12	104.5	4.21	1170.47
SEm±	1.46	0.03	13.15
CD (P ≥0.05%)	4.32	0.08	38.85

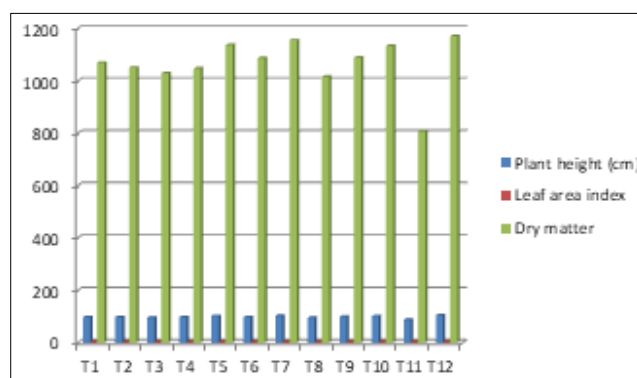


Fig 1: How different ways of getting rid of weeds affect the height (cm) of wheat plants at different times after they have been planted.

No of spike m-2

How much spikes per square meter was all around raised for the sans weed treatment, which looked like Clodinafop 60 g ha-1 + Metsulfuron 4 g ha-1, Sulfosulfuron 30 g ha-1 + Metsulfuron 2 g ha-1, and two hand weeding, yet on an incredibly fundamental level higher than the other weed control philosophies. Clodinafop 60 g ha-1 + Metsulfuron 4 g ha-1 made the most spikes per square meter. This was by and

large around that truly matters, obfuscated from Sulfosulfuron 30 g ha⁻¹ + Metsulfuron 2 g ha⁻¹, yet never-endingly out more than various herbicides.

Spike length (cm)

How the weeds were conveyed out had a fundamental results in how long the spikes were. The best spike was 9.73 inches long, which was essentially longer than weedy check and fenoxaprop-p-ethyle @ 120 g a.i. ha⁻¹, but questionable length as the other weed control frameworks.

One wheat spike is there

There's information about how much grains that are on each wheat spike. It showed that every system for discarding weeds makes absolutely more grain per spike than weedy check. Most grains (43.10) were found in the sans weed treatment, which appeared to be Clodinafop 60 g ha⁻¹ + Metsulfuron 4 g ha⁻¹, Sulfosulfuron 30 g ha⁻¹ + Metsulfuron 2 g ha⁻¹, and two hand weeding, and fundamentally higher than various poisonous substances. Weedy check had the least grains per spike (34.1).

Test weight

There's other than a section that what weeds are checked will not have a central mean for in tests. Anyway, test weight for the sans weed mix was brilliant (36.32 grams).

Grain yield

What well weeds were checked hugely meant for how much grain was made. All of the approaches to overseeing controlling discarding weeds have instigated commonly more wheat grain improvement than when there were a lot of weeds. The most central grain yield 52.50 q ha⁻¹ recorded weed free treatment which was quantifiably at standard to Clodinafop 60 g ha⁻¹ + Metsulfuron 4 g ha⁻¹ (51.10 q ha⁻¹), Sulfosulfuron 30 g ha⁻¹ + Metsulfuron 2 g ha⁻¹ (50.20 q ha⁻¹) and two hand weeding (49.80 q ha⁻¹), while on an uncommonly tremendous level better separated from rest of the weed connection practices. Herbicide Clodinafop 60 g ha something like 1 Metsulfuron 4 g ha⁻¹ had a close to influence as 1 Sulfosulfuron 30 g ha something like 1.

Straw creation (QHA-1)

Despite the way that you discard weeds, you end up with absolutely more straw than without weed check. The without weed treatment made the most straw (66.45 ha⁻¹), which appeared to be Clodinafop 60 g ha⁻¹ + Metsulfuron 4 g ha⁻¹, Sulfosulfuron 30 g ha⁻¹ + Metsulfuron 2 g ha⁻¹, and Fenoxaprop-p-ethyl @ 120 g ha⁻¹ + Metsulfuron 4 g ha⁻¹.

Ordinary creation

Every one of the approaches to overseeing coordinating discarding weeds had a sensational impact in how much wheat could be made on the weedy check. The most raised ordinary outcome revealed with sans weed resembled Clodinafop 60 g ha⁻¹ + Metsulfuron 4 g ha⁻¹, Sulfosulfuron 30 g ha⁻¹ + Metsulfuron 2 g ha⁻¹, and ceaselessly better to the rest of the weed control structures. The mix of Clodinafop 60 g ha⁻¹ and Metsulfuron 4 g ha⁻¹ gave a higher standard yield, which was overall around that truly matters, dark from Sulfosulfuron 30 g ha⁻¹ and Metsulfuron 2 g ha⁻¹ and two hand weeding, yet basically higher than other pesticide drugs. With without weed, Clodinafop-p-ethyl 60 g ha⁻¹ + Metsulfuron 4 g ha⁻¹, Sulfosulfuron 30 g ha⁻¹ + Metsulfuron

2 g ha⁻¹, and two hand weeding, the standard extension in standard yield over the weedy check was 44.74, 42.08, 37.86, and 37.88 percent.

Table 3: Shows how different ways to deal with regulating arranging discarding weeds change how much wheat makes.

Treatments	No. of spike (m ⁻²)	Length of Spike (cm)	No. of spikelets Spike-1	Grain per ear head (m ⁻²)	Test Weight (g)
T1	358.72	8.69	14.17	37.40	34.51
T2	345.49	8.67	14.10	37.00	34.47
T3	335.00	8.51	13.41	36.40	34.47
T4	340.25	8.61	13.65	36.51	34.41
T5	374.82	9.15	16.00	41.70	35.15
T6	362.28	8.87	14.25	38.10	33.43
T7	375.00	9.38	16.05	41.41	35.45
T8	326.85	8.35	12.70	36.00	34.15
T9	375.50	8.90	14.55	38.15	34.97
T10	367.50	9.45	15.98	38.83	35.05
T11	260.10	6.74	12.15	34.31	32.80
T12	379.10	9.73	16.48	43.10	36.32

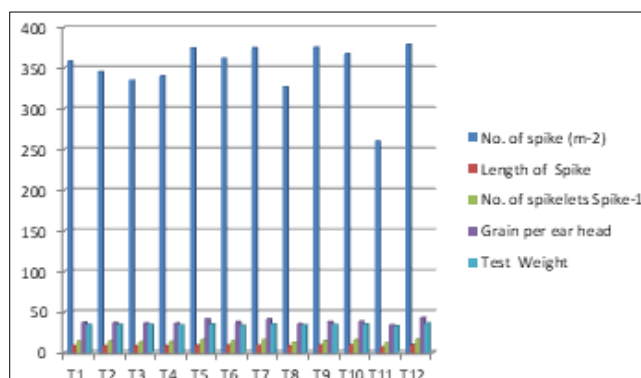


Fig 2: Shows how different ways of getting rid of weeds affect how wheat grows

Conceptual and Once-finished

Sans weed most striking plant level (104.5 cm) was faint from Clodinafop + Metsulfuron (60 + 4 g ha⁻¹) (102.36 cm), Sulfosulfuron + Metsulfuron (30 + 2 g ha⁻¹) (101.74 cm), and two hand weeding (101.37 cm) at gather stage. The leaf district was the best when there were no weeds. This has never been head. at 30 DAS, and absolutely higher than with Clodinafop + Metsulfuron (60 + 4 g ha⁻¹), Sulfosulfuron + Metsulfuron (30 + 2 g ha⁻¹) and two hand weedings at 60 and 90 DAS.

Since there were no bugs when the grain was making, the yield had the most dry matter. At 30, DAS wasn't head, yet at 60, 90, and gather, scatter matter went a ton with sans weed and remained something in each viable sense, muddled with Clodinafop + Metsulfuron (60 + 4 g ha⁻¹), Sulfosulfuron + Metsulfuron (30 + 2 g ha⁻¹), and two hand weeding.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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