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Effect of Fertility Levels and Weed Management Practices on Weed Species and Weed Dry Matter Accumulation

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present investigation was conducted at Agronomy Research Farm, Acharya Narendra Deva University of Agriculture and Technology, Kumarganj, Ayodhya (U.P.) during *Rabi* season of 2019-20. The experiment was laid out in Factorial Randomized block design with three replications keeping four fertility levels viz., 100% RDF-IF (150 kg/h), 125% RDF-IF (25% through FYM), 100%

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RDF + 25%RDN through FYM, 75%RDF-IF+25%RDN through FYM and four weed management practices Weedy Check, Weed free up to 60 days, Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h, Clodinafoppropagynol(60 g) + metsulfuron(4 g)=(64 g/h). Results revealed that among fertility levels application of 125% RDF-IF (25% through FYM) and in weed management practices weed free followed by125% RDF-IF (25% through FYM)+Clodinafoppropagynol (60 g) + metsulfuron (4 g)=(64 g/h) a.i ha^{-1} proved as superior than other treatments with respect to weed population, nutrient loss by weed, dry matter accumulation in weed, was found with the application of 125% RDF-IF (25% through FYM) and weed free treatment combination.

Keywords: Weed management; wheat; species wise; fertility levels.

1. INTRODUCTION

Among the many factors adversely influencing wheat productivity, weed infestation is one of them [1]. Weed complete with crop plants forspace, light, nutrients, moisture and other growth factor. The weeds in India are causing substantial losses to agriculture production. In agriculture weed causes more damage among all pests but due to hidden loss by weed in crop production, it has not takenmuch attention of agriculture experts. Day by day, weed control through herbicides in increasing and popularizing among farmer. Because, weed control through manual methods istedious and time taking and become very costly due to lack of labor in peak period and labor charge are also high due to shifting of agricultural labors to industries for better and assured daily wages. Narrow spacing in wheat causes problem in intercultural operations. So, in irrigated wheat cropparticularly use of herbicides popularized. Herbicides have shown to be beneficial and very effective means of controlling weeds in wheat because they are quite effective and efficient. Second causes of low productivity of wheat imbalance fertilizers uses.

Phalaris minor is particularly most problematic weed in rice wheat cropping system, and it has been recorded to inflict nearly 100 percent crop losses at times. However, some broad leaf weed pause a hazard, but there control is comparatively easier and successful, *Phalaris mionor* has sown to be a difficult weed to eradicate. Since the year 1977, *Phalaris minor* was successfully controlled with isoproturon. However some resistant biotypes have emerged, possibly as result of continued use, particularly in Punjab, Hariyana, Uttarakhand, and a few pockets in western Uttar Pradesh [2]. Considering this facts in view, some new herbicide molecules individually and incombination are to be tested to study their bio-efficiency in control *Phalaris minor* and other weeds in wheat. For effective management of complex weed flora, mixture of more than one herbicide is required. Herbicide mixtures increase weed control efficacy against complex weed flora [3]. Weeding wheat crops at an early stage of growth is critical since excessive weed infestation stymie crop growth and result in lower yield. At the time of germination and also throughout future growth stages, the slow growth of wheat plants provides appropriates circumstances for the growth of diverse weed flora. The weed flora in the experimental field were collected, identified and classified at different stages of crop growth. Predominant weed species among broad leaf weeds *Chenopodium album* L., *Anagallis arvensis* L., *Melilotus alba*, *Fumaria parviflora* and*Vicia spp*whereas *Phalaris minor*, *Avenaludoviciana*and *Cynodondactylon*among grasses. Moreover, among sedges only one species i.e. *Cyperus rotundus*was observed. Malik et al. [4]. which alone causes 33 per cent reductionin wheat yield, The farmers have to make decisions about the selection of right type of herbicides and fertilizer with optimum dose.

2. MATERIALS AND METHODS

The experiment was conducted at the Agronomy Research Farm, Acharya Narendra Deva University of Agriculture & Technology, Kumarganj, Ayodhya (U.P.), 26.470N latitude, 82.120E longitude and an altitude of 113 meters above mean sea level during winter (Rabi) season 2019-20. The experiment was laid out under factorial randomized block design with three replications. Soil texture was silty loam. Organic carbon was found 0.32%, whereas value of available N, available P and available K was 180 kgha-1, 14.7 kgha-1 and 280.5 ha-1. Soil having value of 8.5 result of chemical analysis given in indicated that the soil was low in nitrogen, organic carbon, phosphorus and rich in potassium. There action of soil was slightly alkaline. Treatment under fertility levels were

100% RDF-IF (150 kg/h), 125% RDF-IF (25% through FYM), 100% RDF + 25%RDN through FYM and 75% RDF-IF+25% RDN throughFYM while weed management practices comprises Clodinafoppropagynol (60 g) + metsulfuron (4 g) =(64 g/h), Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h, Weed free up to 60 days and Weedy Check. All herbicide were applied at 25 Days after sowing with the help of knapsack sprayer having spray volume of 700 liter/ha. The data recorded on different observations were analyzed statistically by using the analysis of variance (ANOVA) technique assuggested by Gomez and Gomez (1984).

3. RESULTS AND DISCUSSION

3.1 Weed Density (m^{-2})

3.1.1 *Phalaris minor*

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) butrecorded significantly lower density of *Phalaris minor* over rest fertility levels at all the crop stages. The highest weed density was found with 75% RDF-IF+25% RDN through FYM.Among weed management practices of *Phalaris minor* was found significant effect. *Phalaris minor* density was found significantly lower with weedy free over rest weed management practices. The maximum density of *Phalaris minor* was found under weedy check at all crop stages. Between herbicides minimum weed density was found with Clodinafoppropagynol + metsulfuron.

3.1.2 *Cyprus rotundus*

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) butrecorded significantly lower densityof *Cyprus rotundus* over rest fertility levels at 30 and 60 DAS. At 90 and at harvest 125% RDF-IF (25% through FYM) found significant lower weed density over 75%RDF-IF+25%RDN and found at par over rest of the treatments. The highest weed density was found with 75%RDF-IF+25%RDN through FYM.All the weed management practices of *Cyprus rotundus* was found significant effect. *Cyprus rotundus* density was found significantly lower with weed free over rest weed management practices. The maximum density of *Cyprus rotundus* was found under weedy check at all crop stages. Between herbicides minimum weed density was found with Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h).

Table 1. *Phalaris minor* density (m^{-2}) as affected by various fertility levels and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150kg/h)	3.23 (13.13)	2.76 (10.69)	3.14 (12.77)	2.92 (11.03)
125% RDF-IF (25% through FYM)	3.15 (12.46)	2.77 (10.60)	3.11 (12.57)	2.89 (10.87)
100% RDF + 25%RDN through FYM	3.37 (14.48)	2.92 (11.93)	3.29 (14.00)	3.05 (12.10)
75%RDF-IF+25%RDN through FYM	3.45 (15.15)	3.05 (12.83)	3.45 (15.23)	3.18 (13.10)
SEm ±	0.06	0.05	0.05	0.04
CD at 5%	0.18	0.15	0.14	0.09
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h)	4.68 (21.46)	1.93 (3.25)	2.05 (3.73)	1.85 (2.93)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	4.54 (20.20)	2.57 (6.15)	2.72 (6.93)	2.43 (5.43)
Weed Free (Up to 60 days)	0.71 (00)	0.71 (00)	1.24 (1.05)	1.17 (0.88)
Weedy check	4.65 (21.21)	5.37 (28.39)	5.78 (32.95)	5.43 (29.03)
SEm ±	0.06	0.05	0.05	0.04
CD at 5%	0.18	0.15	0.14	0.09

***Data parenthesis is original *data after square root transformation*

3.1.3 *Chenopodium album*

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) at 30 DAS, 90 DAS and at harvest but recorded significantly lower density of *Chenopodium album* over rest fertility levels at 30 DAS, 90 DAS and at harvest. At 60 DAS 125% RDF-IF (25% through FYM) found significant lower weed dendity over 75%RDF-IF+25%RDN and found at par over rest of the fertility levels. The highest weed density was found with 75%RDF-IF+25%RDN through FYM.All the weed management practices of *Chenopodium album* was found significant. *Chenopodium album* density was found significantly lower with weed free over rest weed management practices. The maximum density of *Chenopodium album* was found under weedy check at all crop stages. Between herbicides minimum weed population of *Chenopodium* album was found with Clodinafoppropagynol + metsulfuron.

3.1.4 *Anagallis arvensis*

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) but recorded significantly lower density of *Anagallis arvvensis*over rest fertility levels at 30DAS, 60 DAS and at harvest of crop growth. At 90 DAS found significant lower weed density over all the fertility levels. Highest weed density was found with 75% RDF-IF+25% RDN through FYM.

All the weed management practices of *Anagallis arvvensis* was found significant. *Anagallis arvvensis* density was found significantly lower with weed free over rest weed management practices. The maximum density of *Anagallis arvvensis* was found under weedy check at all crop stages. Between herbicides minimum weed population of *Anagalis arvensis* has recorded with Clodinafoppropagynol + metsulfuron.

3.1.5 *Cynodondactylon*

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) at all stages of crop growth but recorded significantly lower density of *Cynodondactylon*over at rest fertility levels at all stages of crop growth. The highest weed density was found with 75% RDF-IF+25% RDN through FYM.

Table 2. *Cyperus rotundus*density (m^{-2}) as affected by various fertility levels and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150kg/h)	*2.74 **(9.10)	2.38 (7.40)	2.68 (8.93)	2.49 (7.70)
125% RDF-IF (25% through FYM)	2.68 (8.63)	2.37 (7.37)	2.72 (8.93)	2.52 (7.70)
100% RDF + 25%RDN through FYM	2.86 (10.03)	2.49 (8.33)	2.89 (10.27)	2.69 (8.87)
75%RDF-IF+25%RDN through FYM	2.92 (10.50)	2.43 (8.23)	2.77 (9.90)	2.58 (8.60)
SEm ±	0.05	0.03	0.04	0.04
CD at 5%	0.15	0.11	0.13	0.12
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64g/h)	3.92 (14.88)	1.66 (2.28)	1.76 (2.60)	1.59 (2.05)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	3.80 (14.00)	2.05 (3.73)	2.18 (4.30)	1.96 (3.38)
Weed Free (Up to 60 days)	0.71 (0.00)	0.71 (0.00)	1.26 (1.10)	1.19 (0.93)
Weedy check	3.89 (14.70)	4.49 (13.78)	4.85 (23.13)	4.56 (20.35)
SEm ±	0.05	0.039	0.048	0.042
CD at 5%	0.15	0.11	0.13	0.12

***Data parenthesis is original data after square root transformation*

Table 3. *Chenopodium album* density (m^{-2}) as affected by various Fertilizer management and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150 kg/h)	*3.21 **(13.00)	2.78 (10.7)	3.23 (12.93)	2.99 (11.13)
125% RDF-IF (25% through FYM)	3.14 (12.33)	2.85 (11.00)	3.26 (13.20)	3.02 (11.33)
100% RDF + 25%RDN through FYM	3.36 (14.33)	2.99 (12.33)	3.44 (14.83)	3.18 (12.77)
75%RDF-IF+25%RDN through FYM	3.43 (15.00)	3.07 (13.30)	3.56 (16.03)	3.30 (13.83)
SEm ±	0.06	0.05	0.05	0.05
CD at 5%	0.18	0.15	0.14	0.15
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h)	4.66 (21.25)	1.95 (3.30)	2.11 (3.98)	1.90 (3.13)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	4.52 (20.00)	2.66 (6.58)	2.81 (7.43)	2.50 (5.80)
Weed Free (Up to 60 days)	0.71 (00.00)	0.71 (0.00)	1.49 (1.73)	1.39 (1.45)
Weedy check	4.63 (21.00)	5.40 (28.83)	5.83 (33.60)	5.47 (29.55)
SEm ±	0.06	0.05	0.05	0.05
CD at 5%	0.18	0.15	0.14	0.15

***Data parenthesis is original *data after square root transformation*

All the weed management practices of *Cynodondactylon* was found significant effect. *Cynodondactylon* density was found significantly lower with weed free over rest weed management practices. The maximum density of *Cynodondactylon* was found under weedy check at all crop stages. Between herbicides minimum weed population of *Cynodondactylon* was found with Clodinafoppropagynol + metsulfuron.

3.1.6 *Melilotus alba*

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) 30 DAS, 60 DAS and at harvest but recorded significantly lower density of *Melilotus alba* over rest fertility levels at 30 DAS, 60 DAS and at harvest. At 90 DAS 125% RDF-IF (25% through FYM) found significant lower weed density over 75% RDF-IF+25% RDN and found at par over rest of the fertility levels. The highest weed density was found with 75% RDF-IF+25% RDN through FYM.

All the weed management practices of *Melilotus alba*was found significant effect with any weed management practices. *Chenopodium album* density was found significantly lower with weed free over rest weed management practices. The maximum density of *Melilotus alba* was found under weedy check at all crop stages. Between herbicides minimum weed density was found with Clodinafoppropagynol + metsulfuron.

3.1.7 Other weed density

At all stages fertility levels found significant for other weed density except at 60 DAS. Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) but recorded significantly other weed density over rest fertility levels at all stages of crop growth. The highest weed density was found with 75%RDF-IF+25%RDN through FYM.

All the weed management practices of other weeds was found significant effect. Other weed density was found significantly lower with weed free over rest weed management practices. The maximum density of other weed was found under weedy check at all crop stages. Between herbicides minimum other weed density was found with Clodinafoppropagynol + metsulfuron.

Table 4. *Anagallis arvensis* density (m^{-2}) as affected by various fertility levels and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150kg/h)	2.91 (10.40)	2.53 (8.47)	2.86 (10.20)	2.64 (8.77)
125% RDF-IF (25% through FYM)	2.84 (9.87)	2.50 (8.40)	2.84 (10.07)	2.63 (8.70)
100% RDF + 25%RDN through FYM	3.04 (11.47)	2.67 (9.70)	3.06 (11.80)	2.85 (10.20)
75%RDF-IF+25%RDN through FYM	3.10 (12.00)	2.73 (10.13)	3.12 (12.13)	2.89 (10.47)
SEm ±	0.06	0.04	0.05	0.04
CD at 5%	0.182	0.135	0.157	0.137
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h)	4.18 (17.00)	1.76 (2.60)	1.88 (3.05)	1.70 (2.40)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	4.05 (16.00)	2.31 (4.88)	2.47 (5.65)	2.21 (4.43)
Weed Free (Up to 60 days)	0.71 (0.00)	0.71 (0.00)	1.25 (1.08)	1.18 (0.90)
Weedy check	4.15 (16.80)	4.80 (22.65)	5.18 (26.43)	4.87 (23.28)
SEm ±	0.06	0.04	0.05	0.04
CD at 5%	0.18	0.13	0.15	0.13

***Data parenthesis is original *data after square root transformation*

Table 5. *Cynodondactylon*density (m^{-2}) as affected by various fertility levels and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Factor-A Fertilizer Management:				
100% RDF-IF (150kg/h)	2.56 (7.80)	2.23 (6.33)	2.51 (7.67)	2.33 (6.60)
125% RDF-IF (25% through FYM)	2.50 (7.40)	2.23 (6.37)	2.51 (7.60)	2.34 (6.57)
100% RDF + 25%RDN through FYM	2.67 (8.60)	2.34 (7.23)	2.73 (9.10)	2.55 (7.90)
75%RDF-IF+25%RDN through FYM	2.73 (9.00)	2.50 (8.07)	2.84 (9.70)	2.63 (8.33)
SEm ±	0.04	0.03	0.04	0.04
CD at 5%	0.14	0.10	0.11	0.12
Factor-B Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h)	3.63 (12.75)	1.56 (1.93)	1.75 (2.60)	1.58 (2.03)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	3.53 (12.00)	2.07 (3.80)	2.18 (4.28)	1.95 (3.35)
Weed Free (Up to 60 days)	0.71 (0.00)	0.71 (0.00)	1.22 (1.00)	1.16 (0.85)
Weedy check	3.61 (12.60)	4.20 (17.20)	4.55 (20.28)	4.27 (17.85)
SEm ±	0.04	0.03	0.04	0.04
CD at 5%	0.14	0.10	0.11	0.12

***Data parenthesis is original *data after square root transformation*

The similar results have been also reported by Singh et al. [5], Chopra and Chopra [6], Malik et al. [7] and Tomar and Tomar [8].

3.1.8 Total weed density

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) but recorded significantly lower density of total weeds over rest fertility levels at 30DAS, 60 DAS and at harvest of crop growth. At 90 DAS found significant lower weed density over all the fertility levels. The highest weed density was found with 75% RDF-IF+25% RDN through FYM.All the weed management practices of total weeds was found significant. Total weeds density was found significantly lower with weedy free over rest weed management practices. The maximum density of total weeds was found under weedy check at all crop stages. Between herbicides minimum total weed density was found with Clodinafoppropagynol + metsulfuron.

Table 6. *Melilotus alba density* (m^{-2}) as affected by various Fertilizer management and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150 kg/h)	2.15 (5.20)	1.89 (4.23)	2.13 (5.17)	1.98 (4.43)
125% RDF-IF (25% through FYM)	2.11 (4.93)	1.87 (4.17)	2.09 (5.03)	1.96 (4.37)
100% RDF + 25%RDN through FYM	2.24 (5.73)	1.98 (4.80)	2.20 (5.70)	2.04 (4.90)
75%RDF-IF+25%RDN through FYM	2.29 (6.00)	2.07 (5.27)	2.36 (5.03)	2.19 (5.47)
SEm ±	0.04	0.03	0.03	0.03
CD at 5%	0.12	0.09	0.19	0.08
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4g)=(64 g/h)	2.99 (8.50)	1.32 (1.25)	1.88 (1.68)	1.35 (1.33)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	2.91 (8.00)	1.71 (2.43)	2.47 (2.75)	1.62 (2.13)
Weed Free (Up to 60 days)	0.71 (0.00)	0.71 (0.00)	1.25 (0.68)	1.02 (0.55)
Weedy check	2.98 (8.40)	3.45 (11.43)	5.18 (13.28)	3.49 (11.70)
SEm ±	0.04	0.03	0.03	0.03
CD at 5%	0.12	0.09	0.19	0.08

***Data parenthesis is original *data after square root transformation*

Table 7. Other weeds density (m^{-2}) as affected by various Fertilizer management and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150kg/h)	*1.91 **(3.90)	1.70 (3.20)	1.98 (4.10)	1.67 (2.57)
125% RDF-IF (25% through FYM)	1.87 (3.70)	1.67 (3.13)	1.76 (2.97)	1.66 (2.57)
100% RDF + 25%RDN through FYM	1.99 (4.30)	1.76 (3.57)	2.08 (4.63)	1.93 (3.97)
75%RDF-IF+25%RDN through FYM	2.03 (4.50)	1.78 (3.70)	2.06 (4.63)	1.92 (3.97)
SEm ±	0.03	0.02	0.02	0.02
CD at 5%	0.09	NS	0.07	0.08

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h)	2.62 (6.38)	1.22 (1.00)	1.29 (1.18)	1.17 (0.88)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	2.55 (6.00)	1.49 (1.73)	1.60 (2.08)	1.45 (1.60)
Weed Free (Up to 60 days)	0.71 (0.00)	0.71 (0.00)	1.22 (1.00)	1.16 (0.85)
Weedy check	2.60 (6.30)	2.99 (8.48)	3.09 (9.18)	2.78 (7.35)
SEm ±	0.03	0.02	0.02	0.02
CD at 5%	0.09	0.08	0.07	0.08

***Data parenthesis is original *data after square root transformation*

3.1.9 Weed dry weight

Application of 125% RDF-IF (25% through FYM) found at par with 100% RDF-IF (150 kg/h) at all stages of crop growth but recorded significantly lower density of *Cynodondactylon* over at rest fertility levels at all stages of crop growth. The highest weed density was found with 75%RDF-IF+25%RDN through FYM.All the weed management practices on dry weight of weed were found significant effect. Weed dry weight was found significantly lower with weedy check over rest weed management practices. The maximum weed dry weight was found under weedy check at all crop stages. Between herbicides minimum weed dry weight was found with Clodinafoppropagynol + metsulfuron. The similar findings have been also reported by Khoker and Nepalia [9], Shehzad et al. [10] and Tomar and Tomar [8].

Table 8. Total weed density (m^{-2}) as affected by various fertilizer management and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150kg/h)	6.70 (65.53)	5.73 (50.89)	6.81 (61.77)	6.24 (52.23)
125% RDF-IF (25% through FYM)	6.53 (59.53)	5.72 (51.03)	6.75 (60.37)	6.24 (52.10)
100% RDF + 25%RDN through FYM	7.02 (68.94)	6.07 (57.90)	7.29 (70.33)	6.72 (60.70)
75%RDF-IF+25%RDN through FYM	7.18 (72.15)	6.27 (61.53)	7.48 (74.00)	6.52 (63.77)
SEm ±	0.143	0.110	0.137	0.100
CD at 5%	0.413	0.319	0.0396	0.288
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h)	10.12 (102.21)	4.01 (15.60)	4.38 (18.80)	3.89 (14.73)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	9.81 (96.20)	5.45 (29.28)	5.81 (33.40)	5.15 (26.10)
Weed Free (Up to 60 days)	0.71 (0.00)	0.71 (0.00)	2.84 (7.63)	2.62 (6.40)
Weedy check	10.06 (101.01)	11.69 (136.74)	12.59 (158.83)	11.79 (139.10)
SEm ±	0.14	0.11	0.13	0.10
CD at 5%	0.41	0.31	0.39	0.28

***Data parenthesis is original *data after square root transformation*

Table 9. Weed dry weight (g m^{-2}) as affected by various fertilizer management and weed management practices

Treatments	30 DAS	60 DAS	90 DAS	At harvest
Fertility levels:				
100% RDF-IF (150 kg/h)	*5.25 **(37.52)	4.84 (35.62)	6.47 (55.59)	5.92 (47.01)
125% RDF-IF (25% through FYM)	5.12 (35.59)	4.83 (35.72)	6.41 (54.33)	5.92 (46.89)
100% RDF + 25%RDN through FYM	5.50 (41.37)	5.13 (40.53)	6.92 (63.30)	6.38 (54.63)
75%RDF-IF+25%RDN through FYM	5.62 (43.29)	5.29 (43.07)	7.10 (66.60)	6.54 (57.39)
SEm ±	0.12	0.08	0.12	0.11
CD at 5%	0.34	0.24	0.36	0.32
Weed Management:				
Clodinafoppropagynol(60 g) +metsulfuron(4 g)=(64 g/h)	7.85 (61.33)	3.37 (10.92)	4.16 (16.92)	3.70 (13.25)
Sulfosulfuron @ 30 g/h + Carfentazole @ 20 g/h	7.62 (57.72)	4.57 (20.49)	5.52 (30.06)	4.89 (23.49)
Weed Free (Up to 60 days)	0.71 (0.00)	0.71 (0.00)	2.71 (6.68)	2.50 (5.76)
Weedy check	7.80 (60.61)	9.79 (95.72)	11.95 (142.94)	11.19 (125.19)
SEm ±	0.12	0.08	0.12	0.11
CD at 5%	0.34	0.24	0.36	0.32

***Data parenthesis is original *data after square root transformation*

4. CONCLUSION

After summerising all the results it can be concluded that application of 125% RDF-IF (25% through FYM) ha^{-1} among fertility levels and among weed management practices weed free have minimum weed population, nutrient loss by weed, dry matter accumulation in weed follwed by Clodinafop propagynol (60 g) + metsulfuron (4 g)=(64 g/h) a.i ha^{-1}.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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