Original Research Article

Impact of long term integrated plant nutrient system (IPNS) in rice –wheat cropping system on population dynamics and dominance of weed species in wheat

Abstract

Weeds are the serious constraints in field crops. In 2014-15 and 2015-16 long term experiment was conducted which was earlier established from the year 1994 on IPNS in rice-wheat cropping system using randomized block design with four replications at Badiarkhar farm of the university. Twelve treatments *viz*., control (no fertilizer/manure), 50, 75 and 100% NPK each to rice and wheat through fertilizers, 50% NPK to rice and 100% NPK to wheat through fertilizers, 50% substitution of Nitrogen through FYM, wheat straw and green manure in rice and 100% NPK through fertilizers in wheat; 25% substitution of Nitrogen through FYM, wheat straw and green manure in rice and 75% NPK through fertilizers in wheat; and farmers' practice (40% NPK through fertilizers to each crop plus 5 t FYM/ha on dry weight basis to rice) were evaluated for a period of two years (2014-15and 2015-16). *Phalaris minor* was the most dominant weed during both years followed by *Alopecurus* sp., *Vicia sativa*, *Polygonum hydropiper*, *Lathyrus aphaca* and *Polygonum alatum. Artemisia* sp. and other weeds had a little infestation

during *rabi* 2014-15. While *Cynodon dactylon*, *Anagallis arvensis*, *Centella asiatica* and other weeds had shown their invasion during *rabi* 2015-16.

Keywords: Importance value index, Integrated plant nutrition system, Weed dominance, Wheat

Introduction

Wheat Of the 30 major cropping systems identified in India, rice-wheat cropping system is the most predominant occupying around 10.5 m ha area (Sharma 2009). Farmers realize much of their food security from this cropping system. Besides food security, the low production levels jeopardize farmers' economic security to a considerable extent. To strengthen the economic conditions of the farmers, it is imperative to sustain the productivity of this system. Wheat plays a main role in the diet of humans globally, contributing more to our daily calorie and protein intake. In India, total area under wheat is 30.9 mha with production of 93.5 mt (Anonymous 2016). However, fertilizers are the kingpin in increasing crop productivity. But in case of intensive cultivation, growing of exhaustive crops like rice, use of unbalanced and inadequate fertilizers accompanied by restricted use of organic manures and biofertilizers have made the soils not only deficient in the nutrients, but also deterioration in its health resulting in decline in crop response to the recommended dose of N-fertilizer. Under such a situation, integrated nutrient management (INM) has assumed a great importance and has vital significance for the maintenance of soil productivity (Puli *et al.* 2016).

Weeds are the serious constraints in rice-wheat cropping system. Wheat plays main role in the diet of humans globally, contributing more to our daily calorie and protein intake. For this reason, preventing weed induced yield losses in wheat has high significance for food sustainability. Weed infestation is one of the factors responsible for low productivity (Singh *et al.* 2015). If left uncontrolled, the weeds in many fields are capable of reducing yields by more than 80% (Karlen *et al.* 2002). Weeds are dynamic in nature. The crop(s), cropping systems and management practices mainly influence the weed shifts. Of the total losses caused by pests, weeds have a major share (30%). Studying the weed dynamics is helpful to understand the dominance or absence of a particular species in a crop/cropping system, devise means and ways to reduce their population, find out ways to delay or avoid the development of resistance by them against a herbicide, identify suitable crops for crop rotation/diversification and modify agronomic practices in favour of healthy crop growth. Manure is mainly used as a nutrient source and also in order to improve soil fertility (Ali *et al.* 2012). However, it was found that application of organic manure can increase weeds population (Arif *et al.* 2013) as most of the time incorporation of organic manure such as FYM served as weed seeds store bank (Ali *et al.*2015).

Materials and methods

Experimental site

Geographically, the experimental site is situated at 32°6^{0}N latitude, 76°3^{0}E longitude and 1223.7 m altitude in North Western Himalaya in the Palam Valley of Kangra district of Himachal Pradesh. The present study was undertaken during 2014 and 2015 in an ongoing long - term experiment which was initiated during *kharif* 1991 with rice - wheat cropping system at the Bhadiarkhar farm of CSK HPKV (Choudhary Sarwan Kumar Krishi Vishavvidhyalaya) Palampur university. Palampur represents the sub-temperate humid zone of Himachal Pradesh which is characterized by mild summers and cool winters. The area receives a very high rainfall during monsoon and medium to high rainfall with an occasional snowfall during winters. Agro-climatically, the experimental site falls in the sub-temperate zone in the mid-hills of Shivalik ranges of Himalayas which is endowed with mild summers and cool winters along with high rainfall during south-west monsoons. Average rainfall at the experimental site is 2600 mm/annum, major portion of which(80%) is received during monsoon season (June to September).

The soil of the experimental site was silty clay loam in texture, acidic in reaction (pH 5.5), high in available nitrogen (675 kg/ha), medium in available P (22 kg/ha) and K (221 kg/ha) with CEC (Cation Echange Capacity) of 11.5 c mol (p±). Taxonomically the soils of the region are classified as 'Typic Hapludalf'. The field experiment was established with rice and wheat as test crops. In this field investigation, 12 treatments were evaluated in a randomized block design with four replications which are as follows (Table 1):

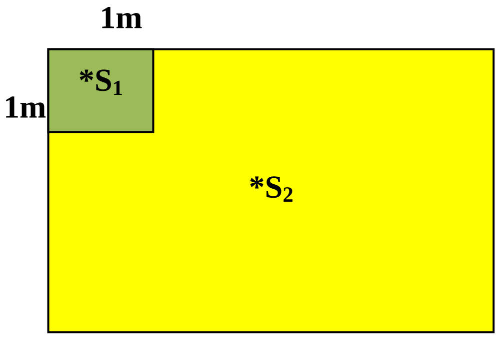
Table 1. Details of treatments in rice-wheat cropping system

Treatment	*Kharif*	*Rabi*
T_1	Control (No fertilizer, no manures)	Control (No fertilizer, no manures)
T_2	50% NPK* through fertilizer	50% NPK through fertilizer
T_3	50% NPK through fertilizer	100% NPK through fertilizer
T_4	75% NPK through fertilizer	75% NPK through fertilizer
T_5	100% NPK through fertilizer	100% NPK through fertilizer
T_6	50% NPK+50% N through farmyard manure (FYM)	100% NPK through fertilizer
T_7	75% NPK+25% N through farmyard manure	75% NPK through fertilizer
T_8	50% NPK+50% N through wheat cut straw (WCS)	100% NPK through fertilizer
T_9	75% NPK+25% N through wheat cut straw	75% NPK through fertilizer
T_{10}	50% NPK+50% N through green manure (GM)	100% NPK through fertilizer
T_{11}	75% NPK+25% N through green Manure	75% NPK through fertilizer
T_{12}	Farmers' practice (40% NPK+ 5t FYM/ha)	Farmers' practice (40% NPK through fertilizer)

*NPK - Through chemical fertilizer

In farmers' practice, FYM 5 t/ha was applied along with 40% NPK to rice followed by 40% NPK to wheat. The recommended (100%) dose of nutrients in rice and wheat was 90:40:40 and 120:60:30 kg N, P_2O_5 and K_2O/ha, respectively. Quantity of farmyard manure (FYM), wheat cut straw (WCS) and *ex-situ* green manure (GM) used in the experiment were worked out on field weight basis and incorporated before transplanting of rice.

Weed studies



*(i) S_1 - No weed control/weedy without herbicide spray or hand weeding during both seasons and,

*(ii) S_2 - Usual weed control both in *kharif* and *rabi*. Two samples (.25m^2) from S_2 were taken randomly during each observation. From S_1, only one sample was drawn each time. (.25m^2)

Two situations as shown above were established in each plot

Importance Value Index: In calculating this index, the percentage values of the relative frequency, relative density and relative abundance were summed up together and this value was designated as the Importance Value Index or IVI of the species as per Ismail *et al.* 2017. This index is used to determine the overall importance of each species in the community structure.

Summed Dominance Ratio (SDR): It indicates the degree of dominance of a species over other species in a given sample plot. The SDR of the weed species was computed using the following equation:

Similarity index: Similarity index is a measure of the relative abundance of the different species making up the richness of an area.

Simpson's Diversity index: Simpson Diversity index is often used to quantify the biodiversity of a habitat. It takes into account the number of species present, as well as the large quantity of each species. It measures the probability that two individuals randomly selected from a sample will belong to same species. It was measured with the following formula:

$$D = \frac{n\,(n-1)}{N\,(N-1)}$$

Where, n= total number of individuals of a particular species, N=total number of individuals of all species, Simpson's Diversity index = 1-D

As D increases, diversity decreases and Simpson's index was therefore usually expressed as 1 – D or 1/ D.As species richness and evenness increase, so diversity increases. With this index, 1 represents infinite diversity and 0, no diversity.

Results and discussion

Wheat (*rabi*)

Surveillance of weed flora

During the *rabi* season the experimental field was monitored at different crop growth phases to look for the presence of different weed species at the particular time. The occurrence of weed species noticed at a particular time of the crop growth, has been shown in Table 2. There were in all 10 weed species found associated during the seasons of 2014-15 and 2015-16. This clearly indicated the greater diversity of weed flora that invaded the wheat crop in the rice-wheat cropping system. The greater diversity of weeds has been documented by a number of workers (Nikolich *et al.* 2012). *Phalaris minor*, *Vicia sativa*, *Lathyrus aphaca* and *Polygonum hydropiper* have shown their presence at most of the stages of crop growth during 2014-15 and 2015-16. *Alopecurus* sp., *Cynodondactylon*, *Artemisia* sp., *Centella asiatica*, *Anagallis arvensis* were noticed at few observations. New weeds *like Artemisia* sp.were noticed in 2014-15 but in 2015-16 *Cynodondactylon*, *Centella asiatica* and *Anagallis arvensis* were noticed. The same weed flora which affect the wheat crop was also observed in the experimental field of wheat in rice-wheat cropping system by Tiwari *et al.* (2013).

Table 2. Dynamics of weed flora in wheat during 2014-15 and 2015-16

Weed species	2014-15					2015-16				
	30 DAS	60 DAS	90 DAS	120 DAS	Harvest	30 DAS	60 DAS	90 DAS	120 DAS	Harvest
Phalaris minor	√	√	√	√	√	√	√	√	√	√
Vicia sativa	√	√	√	√	-	√	√	√	√	√
Lathyrus	√	√	√	-	-	√	√	√	√	√

aphaca										
Polygonum hydropiper	-	√	√	√	√	√	√	√	√	√
Polygonum alatum	-	√	√	-	-	√	√	√	√	-
Alopecurus sp.	-	-	-	√	-	-	-	-	√	√
Cynodondactylon	-	-	-	-	-	√	-	-	-	-
Artemisia sp.	-	-	-	-	√	-	-	-	-	-
Centella asiatica	-	-	-	-	-	√	-	-	-	-
Anagallis arvensis	-	-	-	-	-	-	-	-	√	-
Others	-	√	√	-	√	√	√	√	√	√

√- means presence; DAS- Days after sowing

Weed flora

Phalaris minor was the most dominant weed constituting 74% of the total weed flora during *rabi*2014-15and 59% during 2015-16 (Fig. 1a and 1b). This was followed by *Alopecurus*sp. (13 and 19%), *Vicia sativa* (7 and 15%), *Polygonum hydropiper*(2 and 3%), *Lathyrus aphaca*(2% and 1%) and *Polygonum alatum*(1 and 1%). *Artemisia* sp. (1%) and other weeds (0.4%)were present in a little proportion during *rabi* 2014-15. While

Cynodondactylon (0.2%), *Anagallis arvensis* (0.3%), *Centella asiatica* (0.1%) and other weeds (2%)had shown their invasion during *rabi* 2015-16.

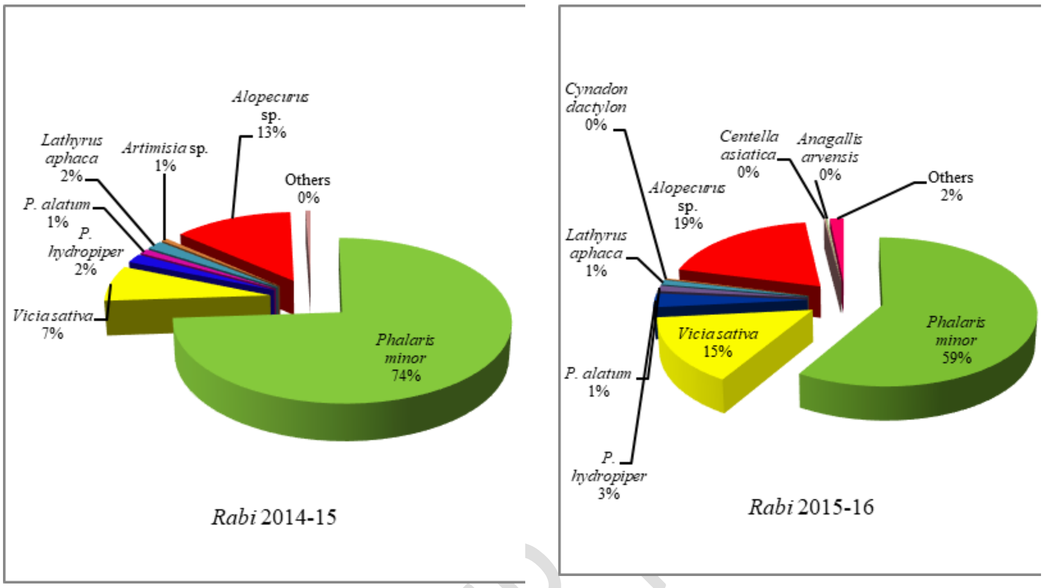


Fig. 1 (a) Weed flora (%) of weeds during *rabi* (wheat) season 2014-15

(b) Weed flora (%) of weeds during *rabi* (wheat) season 2015-16

Phytosociology of *rabi* season weeds

Phytosociological study of weeds, which provides knowledge of the dynamics and relative importance of species in a particular phytosociety or across phytosocieties assume enough relevance in crop-weed ecosystem. It gives an appraisal of species through quantitative characters which allow effective weed management decisions (Sinha and Banerjee 2016). The treatment-wise phytosociological analysis indicated that *Phalaris minor* was the most dominant weed having highest IVI (importance value index), SDR (summed dominance ratio), SI (Similarity index) and lowest SDI (Shimpson Diversity index) during 2014-15 and 2015-16 in all the treatments except T_1 given in Table 3 (Importance Value Index), 4 (Summed Dominance Ratio), 5(Similarity Index), 6(Shimpson Diversity Index). Among all the treatments, T_1 (Control), *Vicia sativa* had highest IVI and SDR during 2015-16 followed by *Phalarisminor*. Dominance of weeds showed due to dominance in population of weeds in particular area.

The next dominantweed in all the treatments was *Alopecurus* sp. which was ahead of *Vicia sativa* in most of the treatments with regards to these phytosociological parameters. The other weeds are of minor importance but can be the future threats in the times to come. But presently the weed management strategy needs to be planned targeting preferentially *Phalaris minor*, *Alopecurus* sp. and *Vicia sativa*.

Quantifying the impact of IPN (Integrated Plant Nutrition) on composition and abundance of weed species in wheat field is helpful in understanding the dynamics of particular weed species, in terms of numbers and diversity. Although weeds create problems in economic gains but simultaneously conserving weeds biodiversity as an integral part of maintaining balanced agro ecosystems. *Phalaris minor* being the dominant weed in wheat has been problems since long time it's control is needed for more economic gain. Presently the weed management strategy needs to be planned targeting preferentially *Phalaris minor*, *Alopecurus* sp. and *Vicia sativa*.

Conclusion

It was concluded that as weeds creates major problem in productivity of crops. In wheat crop in Palampur region *Phalaris minor* is the major problem following by *Vicia satia*, *Polygonum hydropiper* and *Lathyrus aphaca*. *Cynodon dactylon* and *Anagallis arvensis* also showing dominance in this region.

Table 3. Effect of fertility treatments on IVI (Important Value Index) of wheat weeds

Weed species	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
2014-15												
Phalaris minor	112.5	142.1	149.9	168.1	164.9	170.6	171.0	174.2	141.9	168.7	167.4	158.0
Vicia sativa	76.1	37.4	35.5	43.8	32.9	28.2	40.0	29.6	26.9	28.8	30.3	35.4
Polygonum hydropiper	14.6	13.5	23.7	11.4	19.9	5.7	12.7	16.4	15.1	15.5	13.5	16.8
Polygonum alatum	12.8	6.8	9.1	13.7	5.9	4.2	11.9	9.0	13.1	17.3	10.7	14.6
Lathyrus aphaca	10.5	12.5	27.8	12.5	13.8	15.0	7.7	6.9	15.9	26.1	19.2	10.0
Artemisia sp.	4.9	5.2	15.1	9.3	0.0	13.4	0.0	10.8	9.2	7.4	8.9	8.5
Alopecurus sp.	61.4	71.4	35.3	39.2	57.3	57.5	56.6	52.1	67.5	36.1	49.9	56.6
Others	7.2	11.0	3.6	1.9	5.5	5.4	0.0	1.0	10.6	0.1	0.1	0.0
2015-16												
Phalaris minor	90.4	127.0	133.5	122.1	117.6	126.2	119.7	129.5	131.2	146.1	133.7	121.8
Vicia sativa	97.4	52.7	50.3	53.4	48.6	48.7	40.9	50.6	47.3	48.2	43.5	49.6

Polygonum hydropiper	17.3	16.5	21.2	21.4	23.3	7.7	17.4	21.1	17.0	19.0	19.6	19.8
Polygonum alatum	15.7	12.0	10.5	13.9	5.6	4.3	11.6	5.1	10.4	8.9	15.2	13.4
Lathyrus aphaca	7.0	5.4	10.7	9.7	7.6	14.3	12.9	11.7	16.9	0.0	8.2	12.5
Cynodondactylon	4.9	0.0	5.6	6.8	6.6	4.3	5.8	0.0	0.0	0.0	4.6	6.6
Alopecurus sp.	47.8	71.3	54.8	52.4	61.7	68.6	60.2	60.8	66.1	55.6	53.1	56.9
Centella asiatica	0.9	4.3	0.0	0.0	6.6	7.7	4.2	6.7	0.0	0.0	3.6	0.0
Anagallis arvensis	17.2	4.3	0.0	7.7	4.5	0.0	0.0	0.0	0.0	4.5	4.6	7.5
Others	1.4	6.6	13.4	12.5	17.8	18.2;	27.4	14.4	11.2	17.6	14.1	12.0

T1 Control (No fertilizer, no manures to both the crops), T2 (50% NPK to both rice and wheat), T3 (50% NPK to rice and 100% NPK to wheat), T4 (75% NPK to both rice and wheat), T5 (100% NPK to both rice and wheat), T6 (50% NPK + 50% N (FYM) to rice and 100% NPK to wheat), T7 (75% NPK + 25% N (FYM) to rice and 75% NPK to wheat), T8 (50% NPK + 50% N (wheat cut straw) to rice and 100% NPK to wheat), T9 (75% NPK + 25% N (wheat cut straw) to rice and 75% NPK to wheat), T10 (50% NPK + 50% N (green manure) to rice and 100% NPK to wheat), T11 (75% NPK + 25% N (green manure) to rice and 75% NPK to wheat), T12 (Farmers‟ Practice, 40% NPK and FYM 5 t/ha to both the crops)

Table 4. Effect of fertility treatments on SDR (Summed Dominance Ratio) of wheat weeds

Weed species	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
2014-15												

Phalaris minor	37.5	47.4	50.0	56.0	55.0	56.9	57.0	58.1	47.3	56.2	55.8	52.7
Vicia sativa	25.4	12.5	11.8	14.6	11.0	9.4	13.3	9.9	9.0	9.6	10.1	11.8
Polygonum hydropiper	4.9	4.5	7.9	3.8	6.6	1.9	4.2	5.5	5.0	5.2	4.5	5.6
Polygonum alatum	4.3	2.3	3.0	4.6	2.0	1.4	4.0	3.0	4.4	5.8	3.6	4.9
Lathyrus aphaca	3.5	4.2	9.3	4.2	4.6	5.0	2.6	2.3	5.3	8.7	6.4	3.3
Artemisia sp.	1.6	1.7	5.0	3.1	0.0	4.5	0.0	3.6	3.1	2.5	3.0	2.8
Alopecurus sp.	20.5	23.8	11.8	13.1	19.1	19.2	18.9	17.4	22.5	12.0	16.6	18.9
Others	2.4	3.7	1.2	0.6	1.8	1.8	0.0	0.3	3.5	0.0	0.0	0.0
2015-16												
Phalaris minor	30.1	42.3	44.5	40.7	39.2	42.1	39.9	43.2	43.7	48.7	44.6	40.6
Vicia sativa	32.5	17.6	16.8	17.8	16.2	16.2	13.6	16.9	15.8	16.1	14.5	16.5
Polygonum hydropiper	5.8	5.5	7.1	7.1	7.8	2.6	5.8	7.0	5.7	6.3	6.5	6.6
Polygonum alatum	5.2	4.0	3.5	4.6	1.9	1.4	3.9	1.7	3.5	3.0	5.1	4.5
Lathyrus aphaca	2.3	1.8	3.6	3.2	2.5	4.8	4.3	3.9	5.6	0.0	2.7	4.2
Cynodondactylon	1.6	0.0	1.9	2.3	2.2	1.4	1.9	0.0	0.0	0.0	1.5	2.2
Alopecurus sp.	15.9	23.8	18.3	17.5	20.6	22.9	20.1	20.3	22.0	18.5	17.7	19.0
Centella asiatica	0.3	1.4	0.0	0.0	2.2	2.6	1.4	2.2	0.0	0.0	1.2	0.0
Anagallis arvensis	5.7	1.4	0.0	2.6	1.5	0.0	0.0	0.0	0.0	1.5	1.5	2.5

Others	0.5	2.2	4.5	4.2	5.9	6.1	9.1	4.8	3.7	5.9	4.7	4.0

Table 5. Effect of fertility treatments on SI (Similarity Index) of wheat weeds

Weeds species	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
2014-15												
Phalaris minor	35.6	43.7	40.4	44.8	50.0	52.1	51.3	46.8	42.0	45.2	46.3	48.1
Vicia sativa	30.0	25.3	21.3	26.4	18.4	18.3	26.3	21.5	13.6	20.5	22.5	22.8
Polygonum hydropiper	6.7	8.0	12.0	5.7	6.6	2.8	2.6	10.1	9.1	6.8	7.5	10.1
Polygonum alatum	6.7	2.3	5.5	4.6	2.6	1.4	6.6	3.8	4.5	6.8	3.8	2.5
Lathyrus aphaca	5.6	5.7	4.4	5.7	9.2	7.0	2.6	3.8	9.1	5.5	5.0	2.5
Artemisia sp.	2.2	3.4	6.6	3.4	0.0	4.2	0.0	3.8	6.8	4.1	5.0	3.8
Alopcurus sp.	8.9	9.2	8.7	9.2	10.5	11.3	10.5	10.1	9.1	11.0	10.0	10.1
Others	4.4	2.3	1.1	0.0	2.6	2.8	0.0	0.0	5.7	0.0	0.0	0.0
2015-16												
Phalaris minor	30.6	35.4	32.4	32.4	31.9	34.3	22.8	33.6	32.7	34.3	31.6	33.7
Vicia sativa	30.6	27.3	27.0	26.1	23.3	26.7	19.5	29.0	29.0	28.4	24.6	28.7
Polygonum hydropiper	9.9	10.1	9.9	10.8	10.3	3.8	8.7	9.3	6.5	10.8	10.5	6.9
Polygonum alatum	6.3	5.1	5.4	6.3	1.7	1.0	4.7	1.9	6.5	3.9	4.4	4.0

Lathyrus aphaca	2.7	2.0	3.6	1.8	3.4	8.6	4.7	3.7	4.7	0.0	4.4	3.0
Cynodondactylon	0.9	0.0	1.8	2.7	2.6	1.0	2.0	0.0	0.0	0.0	1.8	3.0
Alopcurus sp.	14.4	15.2	14.4	11.7	13.8	13.3	10.1	14.0	15.0	13.7	13.2	14.9
Centella asiatica	0.9	1.0	0.0	0.0	2.6	1.0	0.7	1.9	0.0	0.0	0.9	0.0
Anagallis arvensis	2.7	1.0	0.0	1.8	0.9	0.0	0.0	0.0	0.0	1.0	1.8	1.0
Others	0.9	3.0	5.4	6.3	9.5	10.5	26.8	6.5	5.6	7.8	7.0	5.0

Table 6. Effect of fertility treatments on SDI (Simpson Diversity Index) of wheat weeds

Weed species	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}
2014-15												
Phalaris minor	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Vicia sativa	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Polygonum hydropiper	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Polygonum alatum	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lathyrus aphaca	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Artemisia sp.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Alopecurus sp.	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0
Others	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

2015-16												
Phalaris minor	0.6	0.2	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Vicia sativa	0.5	0.9	1.0	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Polygonum hydropiper	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Polygonum alatum	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lathyrus aphaca	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Cynodondactylon	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Alopecurus sp.	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Centella asiatica	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Anagallis arvensis	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Others	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

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