

## WEED SPECTRUM FREQUENCY AND DENSITY IN WHEAT, (*Triticum aestivum* L.) UNDER TANDOJAM CONDITIONS

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### ABSTRACT

*The quantitative survey of four selected irrigated farms namely; student's Farm, Malir Farm, Latif Farm of Sindh Agriculture University Tando Jam and experimental fields of wheat Research Station. Tando Jam was carried out to determine the weed spectrum during the year 1996-7. In all twenty six weed species were collected, pressed, dried, preserved and poisoned with mercuric chloride and mounted on sheets. Most density populated as well as most frequently occurring weed was common lambsquarters (*Chenopodium album*). Its frequency was 30% and relative density was 13.53%. Whereas *Heliotropium europacum* L. was observed with least population density (0.52) as well as least frequently (3.33 %) occurring weed.*

**Key words:** Density, Mercuric chloride, weed spectrum, *Chenopodium album*.

### INTRODUCTION

Wheat (*Triticum aestivum* L.) is the most widely grown cereal food crop in the world except in the rice eating regions of the Asia. Wheat products are the principle cereal foods of an overwhelming majority of the world population. At present prosperity of many countries largely depends upon wheat production. Wheat is also occupying an important position in the economy of Pakistan. A better progress can be made by increasing the per acre yield of wheat in the country. Among factors which adversely affect the crop yield, weed infestation is the most harmful for wheat crop. The wheat crop in Pakistan suffers losses on average to the extent of 10% due to weeds (Ahmad, 1967). Weeds comprise the most undesirable aggressive and troublesome element of world's vegetation. Weeds are plants which grow out of their proper places and whose virtues have not yet been discovered. Nesterove and Chukanova (1981) recorded the reduction

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in grain yield of wheat caused by different populations of weeds. The greatest reductions were found by the presence of *Cirsium arvense*, *Convolvulus arvensis* and *Amaranthus retroflexus*. Jalis (1987) studied the predominating influence of *Phalaris minor* and *Avena fatua* in wheat. Siddiqui and Shad (1991) reported that the grain yield of wheat declined with the increase in weed density under both rainfed as well as irrigated conditions. Bhatti and Soomro (1994) observed that *Avena fatua*, *Phalaris minor* and *Chenopodium album* as major weeds of irrigated areas of wheat.

The present research was undertaken with a view to determine the weed spectrum, frequency and density of weeds in wheat crop under agro-climatic conditions of Tando Jam, Sindh, Pakistan.

## MATERIALS AND METHODS

The quantitative survey of four selected irrigated farms namely; Students' Farm, Malir Farm, Latif Farm of Sindh Agriculture University Tando Jam and experimental field of Wheat Research Station, Tando Jam was carried out to determine the weed spectrum. In all twenty six weed species were collected, pressed, dried, preserved and poisoned with mercuric chloride and mounted on sheets. These weeds were then identified and kept for future reference.

The quantitative survey of the above mentioned farms was conducted to determine the weed frequency and density of each weed species using quadrat method. The quadrat size taken was 1m x 1m. Ten quadrats were randomly thrown at all the locations. The frequency and density of each weed species was calculated by the following formula;

$$\text{Frequency (\%)} = \frac{\text{No. of quadrats in which weed species occurred} \times 100}{\text{Total No. of quadrats laid out}}$$

$$\text{Relative Density (\%)} = \frac{\text{Mean No. of individual weed species in quadrats} \times 100}{\text{Mean Total No. of individuals of all weed species in quadrats.}}$$

## RESULTS AND DISCUSSIONS

The results (Table-1) show that twenty six weed species, belonging to twenty three genera and fifteen families were found. Whereas, Qazi et al, (2003) reported 10 weed species infesting wheat in the same area. The weed flora includes broad, narrow leaved, grasses and sedges. While, Ahmad and Shaikh (2003) reported 27 weed species from Tando Jam in their studies. The results of frequency

of weeds is presented in Table-2. It is obvious that *Chenopodium album* (broad leaved) was the most frequent weed in the surveyed farms with 30 percent frequency. These results are in accordance with the results obtained by Tunio *et al.* (2004) and Qurashi *et al.* (2002). They also reported that broad leaved weeds had more density than any other weed category reported during the time. The next frequently occurring weed species were *Convolvulus arvensis* L.; *Melilotus indicus* L. *Melilotus albus*; *Phalaris minor* L. Retz., *Cynodon dactylon* L. Pers., and *Avena fatua* L. with frequency percentages of 28.3, 20.0, 20.0, 18.3, 11.6 and 10.0 respectively. The frequency of remaining species was less than 10.0 percent. These results are supported by Parker and Jails (1994), they also listed most of the species during their survey in irrigated wheat in Sindh.

The relative density percentage of weeds is also listed in Table-2. The data show that *Chenopodium album* L. was recorded to be the most densely populated weed of wheat. It was followed by *Melilotus indica* L. The other densely populated weeds were *Melilotus alba* L., *Phalaris minor* L., *Cynodon dactylon* L. Pers. and *Coronopus didymus* (L.) Sm., while the remaining weeds were not present at a larger extent.

It can be concluded from the data that *Chenopodium album* was the most frequently occurring weed of wheat crop in the irrigated farms of Tando Jam. While *Melilotus indica* L. was the most densely populated weed recorded from the same area. These results are in agreement with the findings of Siddiqui and Shad (1991) and Qazi *et al.* (2003) who reported the highest intensities of 35.65 % of *Chenopodium album*. The findings are also further confirmed with the work of Bhatti and Soomro (1994), Abbasi and Makhdoom (1984), Cope (1992) and Parker and Jails (1994). They all have found the same weed species infesting irrigated wheat in Sindh, which have been also identified during the present study.

Concerning the density and frequency of the weeds recorded it can be concluded that common (*Chenopodium album* L), Indian sweet clover (*Melilotus indica* L), field bind weed (*Convolvulus arvensis* L), littleseed canarygrass (*Phalaris minor*) and Bermuda grass (*Cynodon dactylon* L.), are the most dominant weeds of wheat fields of Tando Jam Farms, respectively.

**Table-1. Weeds recorded in wheat crop under agro climatic Conditions of Tando Jam.**

S. No	Weed species	Common Name	Local Name	Family
1.	<i>Alhagi pseudalhag</i> (M.Bieb.) Desvi.	Camels thorne	Kandero	Fabceae (Papilionaceae)
2.	<i>Anagallis arvensis</i> L.	Shepherds grass	Neeli Buti	Priulaceae
3.	<i>Asphodelus tenuifolius</i> Cav.	Wild Onion	Basri	Asphodelaceae
4.	<i>Avena fatua</i> L.	Wild Oat	Jangli Javi	Poaceae (Graminae)
5.	<i>Carthamus oxyacantha</i>	Thistle	Pohli	Asteracea (Compositae)
6.	<i>Chenopodium murale</i> L.	Nettle grass	Jangli Bathu	Chenopodiaceae
7.	<i>Convolvulus arvensis</i> L.	Field bind weed	Naro	Convolvulaceae
8.	<i>Conyza stricta</i> Willd	Fleabane	Gidarwal	Asteraceae (Compositea)
9.	<i>Chenopodium album</i> L.	Lambs quarters	Jhil Bathar	Chenopodiaceae
10.	<i>Cornopus didymus</i> L.	Swine cress	Jangli Halon	Brassicaceae
11.	<i>Cressa cretica</i> L.	-----	Oin	Convolvulaceae
12.	<i>Cynodon dactylon</i> L. Pers.	Bermuda grass	Chhabar	Poaceae (Graminae)
13.	<i>Cyperus rotundus</i> L.	Purple nutsedge	Kabah	Cyperaceae
14.	<i>Digera muricata</i> (L.) Mart.	False amaranth	Lulur	Amarananthaceae
15.	<i>Euphorbia helioscopia</i> L.	Sun spurge	Khirol	Euphorbiaceae
16.	<i>Euphorbia hirta</i> L.	Garden spurge	Khirol	Euphorbiaceae
17.	<i>Heliotropium europacum</i> L.	Potato weed	Uthcharo	Boraginaceae
18.	<i>Mellilotus indica</i> L.	Indian sweet clover	Pili sinjhi	Fabaceae (Papilianaceae)
19.	<i>Mellilotus alba</i> L.	White sweet clover	Safaid sinjhi	Fabaceae(Papilianaceae)
20.	<i>Phalaris minor</i> L. Retz.	Little seed/Canary grass	Dumbi ghas	Poaceae (Graminae)
21.	<i>Polygonum plebejum</i>	Knot weed	Muchachi Khirol	Polygonaceae
22.	<i>Rumex dentatus</i> L.	Curly dock	Jangli Palak	Polygonaceae
23.	<i>Solanum nigrum</i> L.	Black night shade	Pat Paroon, Mako	Solanaceae
24.	<i>Sonchus oleraceus</i>	Sow thistle	Bathal	Asteraceae
25.	<i>Spergula arvensis</i> L.	Corn spury	Khandi dal	Caryophyllaceae
26.	<i>Vicia sativa</i> L.	Common vetch	Matri	Fabaceae (Papilionaceae)

**Table-2. Frequency and density of different weeds occurring in wheat crop under agro-climatic conditions Of Tando Jam.**

S. No	Weed species	Frequency%	Relative Density%
1.	<i>Alhagi pseudalhaqi</i> (M. Bleb) Desvi.	8.33	2.19
2.	<i>Anagalis arvensis</i> L.	10.00	2.28
3.	<i>Asphodelus tenuifolius</i> Cav.	6.66	2.02
4.	<i>Avena fatua</i> L.	10.00	6.67
5.	<i>Carthamus exvacantha</i> (M. Bieb)	6.66	3.86
6.	<i>Chenopodium murale</i> L.	5.55	1.14
7.	<i>Convolvulus arvensis</i> L.	28.33	7.73
8.	<i>Conyza bonariensis</i>	5.00	0.70
9.	<i>Chenopodium album</i> L.	30.00	13.53
10.	<i>Cornopus didymus</i> (L.) Sm.	8.33	5.00
11.	<i>Cressa cretica</i> L.	5.00	1.05
12.	<i>Cynodon dactylon</i> L. Pers.	11.66	5.50
13.	<i>Cyprus rotundus</i> L.	6.66	2.98
14.	<i>Dioera muricata</i> (L.) Mart.	3.33	0.96
15.	<i>Euphorbia prostrata</i> L.	6.66	1.23
16.	<i>Euphorbia hirta</i> L.	5.00	1.32
17.	<i>Heliotropium europacum</i> L.	3.33	0.52
18.	<i>Melilotus indica</i> L.	20.00	13.18
19.	<i>Melilotus albus</i> L.	20.00	8.87
20.	<i>Phalaris minor</i> L. Retz.	18.33	7.64
21.	<i>Polygonum plebeium</i> R. Br.	6.66	2.02
22.	<i>Rumex dentatus</i> L.	8.33	1.75
23.	<i>Solanum nigrum</i> L.	8.33	1.05
24.	<i>Sonchus oleraceus</i> L.	6.66	1.32
25.	<i>Spergula arvensis</i> L.	8.33	4.56
26.	<i>Vicia sativa</i> L.	5.00	0.87

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