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DISTRIBUTION OF WEEDS IN COTTON FIELDS OF MULTAN DIVISION (PUNJAB, PAKISTAN)

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A survey of weeds, endemic to cotton crop, was carried out in four districts of Multan Division. It was ascertained that major portion of weed flora infesting cotton fields comprised of monocots. Cyperus rotundus L. was the most prominent weed with 100% distribution and formed denser stands than all the other weeds. It showed a mean density and frequency of 52.2% and 66.0% respectively and was followed by Cynodon dactylon Pers. The next frequency positions were occupied by dicots viz. Convolvulus arvensis L., Trianthema monogyna L., Tribulus terrestris L., Amarantus viridis L., Euphorbia prostrata Ait., and Corchorus tridens L. respectively.

INTRODUCTION

Weeds deteriorate the quality and quantity of the produce in all crops. Weeding is done to reduce competition of weeds with crops and avoid other harmful effects. These losses caused to crops depend on the type and density of weed infestation (Swan, 1971., Wyse et al., 1986). Therefore, quantitative analysis of weeds in crops is a prerequisite for developing economically and ecologically sound weed control programmes. Such studies have been recently reported for some crops in various parts of Pakistan such as wheats of Punjab (Saeed et al., 1979), wheats of Quetta (Hussain et al.,1985), and maize fields at Kotli (Hussain and Malik, 1986). Distributional survey for cotton infesting weeds has been reported for six weed species only (Saeed et al., 1979). In the present studies quantitative analysis of cotton infesting weeds was taken up in Multan Division.

which is the central and major portion of cotton growing belt in Punjab province.

MATERIALS AND METHODS

A preliminary survey revealed the occurrence of following weeds in cotton fields of Multan division: Amarantus viridis L. (Chaulai), Convolvulus arvensis L. (Lehli), Corchorus tridens L. (wild jute), Cynodon dactylon Pers. (Khabbal), Cyperus rotundus L. (Deela), Desmostachya bipinnata (L.) Stapf. (Dhab), Digera alternifolius (L.) Aschers, Eclipta alba Hassk, Euphorbia prostrata Ait. (Dodhak), Heliotropium europeum L. (Oont chara), Panicum colonum L. (Panicum grass), Portulaca oleracea L. (Kulfa), Portulaca quadrifida L., Solanum xanthocarpum Schrad and Wend (Mamoli), Sorghum halepense L. (Baru), Trianthema monogyna L. (Itsit) and Tribulus terrestris L. (Bhakra).

Eight towns in each of the four districts of this division were earmarked for survey to find out the density and frequency of weeds in cotton fields. In each town the data were taken from 48 fields covering all the four sides of the town, before the picking was undertaken during 1985-86. The number of each weed species was noted per square meter by quadrat methods. After completion of survey, the frequency and density of each weed was calculated in each district and mean was worked out for Multan Division.

The number of quadrats in which a weed species occurred was counted. Percentage frequency was calculated for each weed from total number of quadrats in each district. The percentage density of each weed was calculated separately from the total number of weed plants found in each district. Constancy value of each weed for Multan Division was determined on the basis of its occurrence in various towns surveyed (Philips, 1959).

RESULTS AND DISCUSSION

The perusal of Table 1 indicated that the most frequent weed of cotton fields in all the districts was Cyperus rotundus L. with a mean value of 66%. Its lowest frequency was 58% found in Vehari District and occurred upto 74% in Khanewal. It was followed by another monocot grass Cynodon

Table 1. *Percentage frequency of weeds in cotton fields of Multon Division*

Name of weeds	Multan	Khanewal	Sahiwal	Vehari	Mean frequency	Constancy value
Amarantus viridis L.	34	31	32	17	29	96.90
Convolvulus arvensis L.	56	24	52	53	46	100.00
Corchorus tridens L.	32	12	30	23	24	90.63
Cynodon dactylon Pers.	53	51	60	49	53	100.00
Cyperus rotundus L.	64	74	66	58	66	100.00
Desmostachya bipinnata(L.) Stapf.	–	2	–	3	1	21.90
Digera alternifolius (L.)Aschers.	16	–	13	16	13	56.25
Eclipta alba (L.) Hassk.	20	13	27	19	20	90.63
Euphorbia prostrata Ait.	29	26	17	28	25	96.90
Heliotropium europeum L.	2	–	1	2	1	25.00
Penicum colonum L.	23	11	21	22	19	84.40
Portulaca oleracea L.	21	17	26	17	20	90.63
Portulaca quadrifida L.	22	13	–	29	16	56.25
Solanum xanthocarpum Schrad and Wend.	16	23	25	17	20	90.63
Sorghum halepense.	–	4	–	16	5	37.50
Trianthema monoqyna L.	37	28	45	46	39	100.00
Tribulus terrestris L.	32	32	40	32	34	100.00

Table 2. *Percentage density of weeds in cotton fields of Multan Division*

Name of weed	Multan	Khanewal	Sahiwal	Vehari	Mean density (%)
Amarantus viridis L.	3.6	3.6	4.1	1.0	3.1
Convolvulus arvensis L.	5.7	5.5	5.8	6.2	5.8
Corchorus tridens L.	1.6	0.9	1.5	1.9	1.5
Cynodon dactylon Pers.	16.1	18.2	16.2	17.5	17.0
Cyperus rotundus L.	51.6	54.3	49.4	53.6	52.2
Desmostachya bipinnata (L.) Stapf.	-	L*	-	0.1	L*
Digera alternifolius (L) Aschers.	1.6	-	1.8	1.5	1.2
Eclipta alba (L.) Hassk.	1.7	1.1	1.8	1.9	1.6
Euphorbia prostrata Ait.	3.0	2.9	1.6	2.2	2.4
Heliotropium europeum L.	0.1	-	L*	L*	L*
Panicum colonum L.	1.8	1.3	1.8	1.3	1.6
Portulaca oleracea L.	2.2	1.1	3.3	1.1	2.0
Portulaca quadrifida L.	1.9	1.1	-	1.1	1.0
Solanum xanthocarpum Schrad and Weed.	0.7	1.2	2.1	1.4	1.3
Sorghum halepense L.	-	0.2	-	1.1	0.3
Trianthema monogyna L.	5.2	6.0	6.9	5.0	5.8
Tribulus terrestris L.	3.3	2.6	3.7	3.1	3.2

* L = Less than 0.1 %.

Cynodon dactylon Pers. (53%) spreading over soil. Convolvulus arvensis dicot weed stood next in order of frequency level with a value of 46%. Due to its twining nature it became prominent only when it began flowering. Trianthema monogyna was a more prominent dicot weed, inspite of being represented in 39% fields only, as it occupied more space due to its large size and prostrate habit.

Tribulus terrestris L., Amarantus viridis L., Euphorbia prostrata L. and Corchorus tridens L. were the next frequent weeds, being 34, 29, 25 and 24% respectively. Heliotropium europeum L. and Desmostachya bipinnata (L.) Stapf. with least frequency of 1% each. Sorghum halepense L. was also recorded rarely, but whenever present it was very prominent due to its larger size than other weeds. The rest of the weeds had a value between 1 to 20%. On the whole monocot weeds showed frequent occurrence in cotton fields as compared to dicot weeds. Similar results have been reported for jute in India (Sarawat and Mukerjee, 1983).

As shown in Table 2 the most dense stands were formed by Cyperus rotundus L. having a mean value of 52.2%. This weed usually made its appearance in July and dominated the flora of cotton fields in Punjab. It was also reported as the most dominant of the six weeds surveyed by Saeed et al. (1979). Second dense position was occupied by Cynodon dactylon Pers. represented by 17% of weed species infesting cotton fields. None of the dicot weeds formed more than 6% of this weed spectrum. The most conspicuous of these was Trianthema monogyna L. represented by 5.8% plants only. Convolvulus arvensis L. having the same value occupied less area. Tribulus terrestris L., Amarantus viridis L. and Euphorbia prostrata Ait. had an intermediate position among those showing a density of more than 2%. The lowest density was noted for Desmostachya bipinnata L. Staf.and Haliotropium europeum L.

Convolvulus arvensis L., Cynodon dactylon Pers., Cyperus rotundus L., Euphorbia prostrata L., Trianthema monogyna L. and Tribulus terrestris L. had 100% constancy value, occurring in all the areas of Multan Division. The weeds recorded in more than 80% of the towns were Amarantus viridis L., corchorus tridens L., Eclipta

alba Hassk., Portulaca oleracea L. and Solanum xanthocarpum Schrad and Wend. The rest of the weeds had a constancy figure lower than 60%. Very high number of constant species indicates similarity in the habitat and climatic conditions.

Cyperus rotundus L. and Cynodon dactylon Pers. seemed to occur in several areas of Pakistan as these were also reported to have 100% distribution in Tobacco fields of Yar Hussain, district Mardan (Hussain et al., 1986), and maize fields of Kotli in Azad Kashmir (Hussain and Malik,1986). High constancy of these weeds in Punjab, Sarhad and Azad Kashmir is a proof for their wide ecological range. Both being perennial weeds require intensive studies for the development of a sound weed control system for them.

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