Weed Flora of Chickpea (Cicer arietinum L.) in Haryana

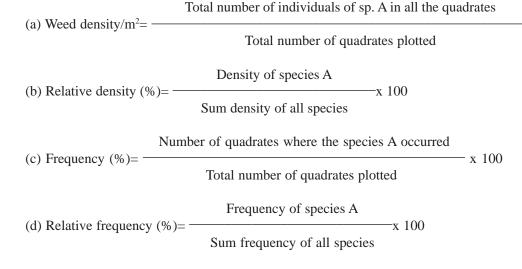
S. S. Punia, Samunder Singh, Dharambir Yadav and Ranveer Singh

Department of Agronomy

CCS Haryana Agricultural University, Hisar-125 004 (Haryana), India

Chickpea (Cicer arietinum L.) is one of the major winter season pulse crops of South-Western Haryana. This crop is grown mainly under conserved moisture. Recently, area under cultivation of chickpea has also picked up due to availability of high yielding varieties under irrigated conditions. Crop-weed competition has been established as major deterrent for its low productivity causing yield reductions to the extent of 40-80% depending upon type and density of weed species present (Singh and Singh, 1992; Vaishya et al., 1996). Crop type and soil properties had greatest influence on the occurrence of weed species (Streibig et al., 1984; Andreasen et al., 1991). The type of irrigation, cropping pattern, weed control measures and environmental factors had a significant influence on the intensity and infestation of weeds (Saavedra et al., 1990). So, knowledge of weed species associated with crops in a region is, therefore, pivotal and necessary to plan and execute a sound and economical weed management strategy depending upon various factors affecting weed distribution in different areas. The present survey was, therefore, an attempt to study the composition of the weed flora of chickpea crop in all chickpea growing districts of Haryana state.

To study the floristic composition of weeds in chickpea in South-Western Haryana, 68 fields were surveyed in Hisar and Bhiwani districts of the Harvana state during January-February, 2008, where chickpea is the predominant crop. This period depicted most appropriate representation of majority of weed species as the weeds had cumulative effects of all agronomic practices, soil type, fertilizer and irrigation application and weed control measures adopted during initial crop growing period. The road map of Harvana state was followed and routes were planned to establish sampling localities as equidistantly as possible (about 10 Kms) avoiding inhabited areas. Four observations on density of individual weeds were recorded per field from four spots by using quadrate of (0.5 x 0.5 m), 100 metre deep inside the fields to have a uniform and true representation of the area. Pooled average values of observations of weed density and per cent occurrence of individual weeds were thus calculated as per method suggested by Misra (1968) and Raju (1977) given as under :



(e) Importance value index (IVI)=Relative density+Relative frequency

As major area under chickpea crop is under rainfed conditions or sprinkler irrigation in light texture

soil, so mainly broadleaf weeds were recorded. In all 17 weed species belonging to 13 families were observed

with predominance of Chenopodiaceae and Liliaceae. Major weeds which were found to provide strong competition to gram crop were *Asphodelus tenuifolius*, *Chenopodium album*, *Trigonella polycerata*, *C. murale*, *Convolvulus arvensis* and *Euphorbia dracunculoides* (Table 1). *E. dracunculoides* was present only in crop grown in sandy loam soils under rainfed conditions. In addition to these major weed species, other weeds present were *Sisymbrium irio*, *Fumaria parviflora*, *Vicia sativa*, Aerva javanica, Launaea procumbens and Melilotus indica with IVI values of 7.6-3.4. Based on IVI values A. tenuifolius was the most competitive weed with IVI value of 51.4% followed by C. album (42.5%), T. polycerata (37.2%), C.murale (15.8%), C. arvensis (5.5%), E. dracunculoides (8.6%) and S. irio (7.8%). Malik and Singh (1994) also reported dominance of A. tenuifolius, C. album and E. dracunculoides in chickpea during the survey conducted earlier in 1990.

Table 1. Weed flora of chickpea in Bhiwani and Hisar districts of Haryana state

Weed species	Weed density/m ²	Relative density (%)	Relative frequency (%)	Importance value index (%)	Family
Asphodelus tenuifolius	82.3	35.70	15.70	51.00	Liliaceae
Chenopodium album	58.1	25.20	17.30	42.50	Chenopodiaceae
Trigonella polycerata	49.7	21.50	15.70	37.20	Leguminosae
Chenopodium murale	9.9	4.30	10.52	15.82	Chenopodiaceae
Convolvulus arvensis	1.4	0.60	4.95	5.56	Convolvulaceae
Euphorbia dracunculoides	12.6	5.50	3.12	8.62	Euphorbiaceae
Sisymbrium irio	3.4	1.50	6.32	7.82	Cruciferae
Fumaria parviflora	1.4	0.67	3.71	4.31	Fumariaceae
Aerva javanica	0.7	0.34	3.11	3.45	Amarantaceae
Melilotus indica	1.2	0.53	3.11	3.64	Leguminosae
Spergula arvensis	0.4	0.17	1.25	1.42	Caryophyllaceae
Rumex spinosus	5.0	2.17	0.63	2.80	Polygonaceae
Launaea procumbens	1.0	0.43	3.20	3.63	Compositae
Ziziphus rotundifolia	0.6	0.26	3.11	3.37	Rhamnaceae
Avena ludoviciana	0.4	0.17	1.85	2.02	Gramineae
Vicia sativa	0.8	0.35	1.85	2.20	Leguminosae
Cynodon dactylon	0.3	0.20	1.85	2.05	Gramineae

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