A QUANTITATIVE ACCOUNT OF WEEDS OF SUGARCANE (*SACCHARUM OFFICINARUM LINN.*) CROP IN DISTRICT SUKKUR

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ABSTRACT

Survey of weeds of sugarcane crop was carried out in the Sukkur District during 1998-1999. Fifty weed-species belonging to 21 angiospermic families are reported from sugarcane fields.

The most dominant and frequent weed-species was Desmostachya bipinnata at all the selected cultivated sites of sugarcane crop. Other frequent species were Cynodon dactylon, Trianthema portulacastrum, Tribulus terrestris, Alhagi maurorum, Cyperus rotundus, Dichanthium annulatum, Convovulus arvensis and Achyranthes aspera.

INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is a member of Poaceae family. According to Memon [1], it is the 2nd largest non-food grain cash-crop after cotton, in Pakistan, which occupies around 4% of the total cropped area and contributes 14% of value added by the major crops. Pakistan stands 5th in sugar-producing countries of the world, as reported by Bhatti & Soomro [2].

Due to the importance of sugar in daily life, its cultivation is increasing. It is cultivated throughout Pakistan on an area of 964.5 thousand hectares [3] with its production of 41,998.4 thousand tones but unlike other developed countries its per-acre yield continues to be as low as half of their output, due to the missmanagement of weed-control. Ibrahim [4] reported that weeds cause 40% losses in cane-yield. Gravity of the weed problem becomes even more serious, when this crop has to stay in the fields for 10-12 months. Magnitude of yield-reduction, due to weeds, varies from place to place, country to country and region to region. Gupta [5] noted that the weeds alone are responsible for causing as much as, 71% reduction in the total yield per hectare of sugarcane. Singh *et al.* [6] observed that the critical period of weed-control is between 30 & 120 days after planting sugarcane. Weeds are uninvited plants growing in the cultivated crops. They compete and share with the principal, crop chiefly for light, nutrients, water and carbon dioxide, as observed by Anderson [7]. Schwerzel & Thomas [8] recorded that they use three to four times more nitrogen, potassium and magnesium than a weed- free crop. They arise immediately during the period of germination of sugarcane. It was observed that even after germination, they grow rapidly and compete with the crop in its early stage of growth. Therefore, they reduce crop-yield as jointly reported by Hussain [9] & Mahmood [10] and for the achievement of excellent yield they are generally removed by various methods.

As a matter of fact, this type of study has been launched for the first time in District Sukkur. Previously, Qureshi *et al*. [11] contrived weed communities of this crop in this area. This type of study was not undertaken on this crop in the subject area. The study of weeds at Sukkur involves their correct identification, spectrum, density and frequency. On the basis of these values, on a particular soil, under the given climatic condition, we will be able to recognize the severity of weed-infestation and undertake farm-management of crops. Such type of work was not carried out previously in District Sukkur.

MATERIALS & METHODS

Collections of weed-species were made from all the growing localities of sugarcane crop during 1998-99. The plants were identified with the help of authentic material as in Jafri [12] & Nasir & Ali [13].

Twenty five quadrates were randomly selected from all cultivating sites, having each quadrate of 2x2 m in size. Density and frequency was calculated by following the work of Hussain *et al*. [14].

RESULTS

Fifty weed-species, belonging to 21 angiospermic families, are reported from sugarcane fields during 1998-99. Their important incidence values, like density and frequency, were recorded in order to check the damage to the crop. These values are listed below.

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Density

Desmostachya bipinnata was observed as the most dominant and frequent weed-specy in all the selected fields, with average percentage of 33.29 % (Table. 1). It was followed by *Cynodon dactylon*, *Trianthema portulacastrum*, *Cyperus rotundus*, *Spergula arvensis*, *Melilotus indica*, *Rumex dentatus* and *Tribulus terrestris* with a percentage ranging from 5.68 to 17.56%. The other weeds, like *Anagalis arvensis*, *Phalaris minor*, *Brachiaria eruciformis*, *Achyranthes aspera*, *Asphodelus tenuifolius* and *Cressa cretica,* were observed less dominant in the areas under study.

The highest density resulted in thinning the crop and increased yield-loss. The dominant weed-species compete with the crop for habitat and atmospheric resources, and abridge the growth and yield of the related crops.

Frequency

Desmostachya bipinnata appeared as the most frequent specy, with a percentage of 100% in selected cultivated sites of sugarcane crop (Table-1). The other frequent species were *Cynodon dactylon*, *Trianthema portulacastrum*, *Tribulus terrestris*, *Alhagi maurorum*, *Cyperus rotundus*, *Dichanthium annulatum*, *Convovulus arvensis* and *Achyranthes aspera,* with frequencies ranging from 60 to 85%. The less common weed-species were *Cucumis melo* var. a*grestis*, *Melilotus indica*, *Phalaris minor*, *Rumex dentatus*, *Lathyrus aphaca*, *Spergula arvensis* and *Xanthium indicum,* with frequency percentages of 5-20.

DISCUSSION

The resemblance between the sites is most likely due to alluvial loamy soils. According to Hussain [9] the dominating weed-species compete and might

Table - 1: Important Incidence-Values of Various Weeds of Sugarcane Crop in District Sukkur

S. No.	Botanical Name	Density %	Frequency %
1	*Achyranthes aspera* Linn.	3.65	60
2	*Alhagi maurorum* Meidc.	3.24	75
3	*Amaranthus virdis* Linn.	1.12	25
4	*Anagalis arvensis* Linn.	4.87	50
5	*Asphodelus tenuifolius* Cavan.	3.52	35
6	*Brachiaria eruciformis* (J.E. Smith) Griseb.	4.19	40
7	*Chenopodium album* Linn.	2.43	30
8	*Cirsium arvense* (L.) scop.	2.14	30
9	*Convolvulus arvensis* Linn.	3.16	65
10	*Conyza canadensis* (L.) Conquist.	2.5	40
11	*Corchorus aestuans* Linn.	1.75	45
12	*Corchorus tridens* Linn.	3.15	40
13	*Corchorus trilocularis* Linn.	1.27	35
14	*Cressa cretica* Linn.	3.51	35
15	*Cucumis melo* var. *agrestis* Naud.	1.79	5
16	*Cynodon dactylon* (L.) Pers.	17.56	85
17	*Cyperus rotundus* Linn.	9.68	75
18	*Desmostachya bipinnata* (L.) Stapf.	33.29	100
19	*Dichanthium annulatum* (Forssk.) Stapf.	2.33	70
20	*Digera muricata* (L.) Mart.	1.79	50
21	*Echinochloa colonum* (L.) Link.	2.81	45
22	*Echinochloa crusgalli* (L.) P. Beavu.	2.51	40
23	*Eclipta prostrata* (L.) Linn.	2.96	40
24	*Eragrostis minor* Host.	1.99	55
25	*Euphorbia granulata* Forsk.	1.12	45
26	*Euphorbia hirta* Linn.	2.13	45
27	*Lathyrus aphaca* Linn.	1.51	20

28	*Launaea procumbens* (Roxb.) Ramayya & Rajagopal.	2.05	30
29	*Leptochloa panicea* (Retz.) Ohwi.	0.9	55
30	*Melilotus alba* Medik.	1.69	65
31	*Melilotus indica* (L.) All.	7.98	10
32	*Oxystelma esculentum* (L. f.) R. Br.	1.05	45
33	*Phalaris minor* Retz.	4.51	15
34	*Phrgmites karka* (Retz.) Trin. ex Steud.	1.78	65
35	*Phyla nodiflora* (L.) Greene.	1.69	35
36	*Phyllanthus fraternus* Webster.	1.65	35
37	*Polypogon fugax* Nees ex Steud.	6.57	40
38	*Portulaca oleracea* Linn.	1.11	30
39	*Rhynchosia minima* (L.) DC.	0.87	40
40	*Rumex dentatus* Linn.	6.15	15
41	*Solanum nigrum* Linn.	2.51	30
42	*Sonchus asper* (L.) Hill.	1.78	40
43	*Sonchus oleraceus* Linn.	1.61	40
44	*Spergula arvensis* Linn.	9.15	20
45	*Trianthema portulacastrum* Linn.	14.36	85
46	*Tribulus terrestris* Linn.	5.68	80
47	*Typha elephantiana* Roxb.	1.87	30
48	*Vicia hirsuta* (L.) S.F. Gray	1.48	25
49	*Vicia sativa* Linn.	1.63	30
50	*Xanthium indicum* J. Koenig.	1.03	20

exert allelopathic stress to reduce the growth and yield of associated crop. These weeds use the available habitat resources to deprive the crop, atleast in parts of its potential food-resources. So they reduce height, growth, girth, yield and productivity of the crop. Bhatti & Soomro [2] reported that the reduction in yield of cane due to the weeds, could be 10-50 %. If weeds are removed in early stage, the young sugarcane plants will grow vigorously and, within a few months they will be tall enough to shade the ground and prevent the further growth of weed.

Weeds may also provide harborage and breeding-places for mites, insects and rodent pests. *Echinochloa* spp. has alternative hosts for green leafhopper and source of Tungro virus and dwarf virus, as observed by Oudejan [15]. Khaskheli [16] reported that certain weeds, like *Rumex dentatus*, *Convovulus arvensis, Melilotus* spp., *Launaea procumbens* and *Chenopodium album,* are good hosts of White Fly (*Bemisa tabaci*), which is a carrier of leaf curle-virus. This insect also sucks the water and nutrients from plants.

Various weeds, like *Desmostachya bipinnata, Cynodon dactylon, Cyperus rotundus, Phragmites karka, Typha elephantiana* and *Alhaji maurorum,* propagate by suckers, bulbs, corns and are more resistant to extreme climate. They have deep root-system and receive more nutrients and water from substratum. They are perennial weeds and can be controlled by cultural practices.

CONCLUSION

Weeds can even grow under the best contrived state, due to the easy dispersal by wind, irrigation and rain-water, birds, animals and by man. It is essential to keep them under control by appropriate mean.

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