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WEEDS OF COTTON CROP IN DISTRICT KHAIRPUR, SINDH

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ABSTRACT

Twenty-five fields/sites of cotton crop has been surveyed in which 27 weed species of 15 families have been reported. Floristic account of weed species has been compiled based on the fresh material collected from the crop and field observations. *Trianthema portulacastrum*, *Ipomea aquatica* and *Oxystelma esculentum* have been found most dominant and virulent among weeds. *Oxystelma esculentum* and *Phragmites karka* have been reported as a weed of Cotton crop for the first time. List of species showing their families are included. Herbarium specimens have been preserved in the herbarium of Shah Abdul Latif University, Khairpur, Sindh, Pakistan.

Introduction

Cotton is the only fibers producing crop, which has been regarded as backbone in the economy of Pakistan. Production-wise, Pakistan is the sixth biggest cotton producing country after Turkey, China, Mexico, U.S.A and Iran. Raw cotton and cotton-based products are always remained the leading exports of Pakistan.

According to Economic Survey (1998-99) the drop fall in cotton production from 9.2 million bales in 1997-98 was reduced to 8.8 million bales in 1998-99 against the target of 10.5 million bales that estimates about 1.25% reduction in the last year (1998-99). The major reasons behind the low production is due to unfriendly climatic conditions i.e. rain and hailstorm in Punjab and virus attack in Sindh. The enigma, responsible for the decrease in yield, is of course the Constant and the Sporadic in nature (Table 1). One of the constant threats to cotton crop is weed infestation.

In fact, weed species are those plant which by common judgement as an unwelcome guest (Hammer *et al.*, 1997), effectively competing with the beneficial and desirable crop plants for space, nutrients, sunlight and water. These weeds also interfere with agriculture operations. This all is resulted in reducing the yield and quality of the produce. According to Anderson (1983) weeds compete with crop mainly for light, nutrients, water and carbondioxide. The damage caused by weeds through the loss of nutrients and water is a major cause of concern to the growers. Schwerzel and Thomas (1971) observed that the weeds consumed three to four times more nitrogen, potassium and magnesium than a weed-free crop. Therefore, the estimated production from crops will be at bottom level. They also noted that weeds remove more moisture from the soil than the cotton plants. Drennan and Tenning (1970) estimate about 60% reduction in seed cotton yield if the weeds were left unchecked.

Establishment of a particular weed flora or occurrence of a plant at a particular place is influenced by many factors. Amongst these are climate (Grime, 1979), climate and soil (Werger, 1979), light, water and nutrients (Aldrich, 1984), rainfall and moisture (Milijic, 1987; Wilson, 1985 and Robert et al., 1988), temperature (Williams and Grovers,1980) and nutrients (Nadeau and William,

1990; Daniels 1986; Jager and Posno, 1979). Besides these many other factors may affect the vegetation establishment one way or the other.

There are different studies depict the magnitude of weed losses in Pakistan. Gill *et al.* (1979) estimated loss from 15-50 percent. Jalis and Shah (1982) reported reduction in cotton yield ranged from 12-53 to 41.29 percent due to the presence of weeds in cotton crop. On the contrary, they found increase in yield from 14.53 to 70.34 percent when weeds were effectively controlled in cotton crop.

Hussain *et al.* (1987) reported diversity of weed spectrum for the 12 cotton growing districts of the Punjab where he found *Cyperous rotundus, Convolvulus arvensis, Cynodon dactylon, Trianthema monogyna, Portulaca oleracea and Sorghum halepense* as dominant weed species.

Brohi and Makhdoom (1987) provided a list of important weed species of Cotton crop occurring Tandojam area, includes *Echinochloa colonum, Cyperous rotundus, Cynodon dactylon, Desmostachya bipinnata, Trianthema monogyna, Convolvulus arvensis, Brachiaria reptans, Tribulus terristris, Euphorbia pilulifera, Chorchorus depressus, Digera arvensis, Rhynchosia minima, Phyllanthis niruri, Portulaca cleraceae* and *Amranthus polygamus.*

Ullah *et al.* (1995) reported *Trianthema monogyna, Digera arvensis, Echinocoloa colonum, Cyperous rotundus, Cynodon dactylon, and Digitaria timorensis* as the most common weed in the fields of cotton crop at Agronomic Research Station in Bahawalpur.

The cotton crop in Khairpur district, Sindh like other cotton producing area in Pakistan is heavily infested with 27-weed species. Taking into account the severity of the weed problem prevailing in cotton crop in this area, the present survey was undertaken.

Material and methods

Twenty five sites/fields of cotton crop were selected from District Khairpur,Sindh. In this regard Quadrat method recommended by Pound and Clements (1898) was applied for the collection of data. Five quadrats of $1m^2$ were selected from each site randomly. The statistics (frequency and density) of weeds will be presented elsewhere. The seedlings of most of the weed species were transplanted into pots from different wheat fields/sites in order to check its growth and vigor.

The herbarium sheets of these species have been prepared and deposited in the herbarium of Shah Abdul Latif University Khairpur. Description of each species was made on the personal observation.

Results and discussions

The data presented in the Table 2 depicts the total number of weed species found in District Khairpur. Some of the weeds, considered as greatest enemies to cotton crop and constant fear for growers/farmers are discussed here. These weeds fall under various categories based on their mode of growth: annuals, biennials and perennials; based on their cotyledons: monocotyledons and dicotyledons; based on nature of their stem: herbaceous, semi-woody and woody plants. The present survey has suggested one more category a Climbing Weed

(CW) that may also comes under nature of stem. In the aforementioned groups of weed, Broad Leaf Weeds (BLW), Grassy Weeds (GW) and Sedges Weeds (SW) are recognized. Memon (2000) determined one more category of weeds as surpassing one, which are either taller than or some how equal to actual crop in height, are also reported.

Cynodon dactylon (Bermudagrass) observed as a common creeping, perennial grass, a most troublesome and pestiferous weed propagated by rhizomes. It is a hard pernicious, aggressive and invasive weed. It depletes nutrient, moisture, soil aeration, light, space and also become an alternate host of many pests and diseases. This weed is considered as a potent allelopathic plant, which further depresses crop production through root exudation and leaf leaching of several phytotoxic compounds (Horowitz and Friedman1971; Diaz and Kogan 1985; Labrada *et al.*1986). Single plant can produce more than 200 seeds. Vencill *et al.* (1992) indicated that heavy infestation of Bermudagrass have remarkable negative effect on cotton crop height, canopy width, leaf area, seed and yield.

Cyperus rotundus observed one of the serious perennial and common weeds having an extensive system of rhizomes and tubers. They give rise shoots attaining up to 40cm height. This weed is strong competitor for nitrogen and can remove many kilograms of nutrients from the soil (Bhardwaj and Verma, 1968). In fact this plant produces viable seeds but its chief source of infestation is tubers. A single plant can produce one tuber per day. It remains viable in the soil for several years and thus causes potential threat to the crop.

Amaranthus virdis a common herbaceous, annual weed. It accumulates considerably high concentration of nitrogen (3.16%) and potash (4.5%) from the soil (Vengris *et al.* 1953). Present survey confirms its high capacity of seed production that is nearly 2, 00,000 per plant per year.

Celosia argentea, White cock's comb is one of the annual herbaceous plant comes under the surpassing category of weeds. It reaches up to two meters in height as if it escapes from eradication by animal hoeing. The seeds propagate it. Its regeneration after cutting is also very common. It enjoys fertilizer and care being taken by the farmers for the cotton crop. Therefore, the plant becomes more vigorous. Some of its seedlings were transplanted into the pots and kept separately. As result, plants from pots found weaker and smaller in size as compare to the plants from actual crop. This plant before the cotton picking produces an enormous seed.

Corchorus aestuans, *Corchorus tridens* and *Cleome viscosa* are annual herbs, found more dominant and common. They mature before the picking of cotton and produce seeds in thousands. Such a huge number of seeds mix with the soil and re-emerge in the following seasons.

Ipomea aquatica and *Oxystelma esculentum* are found deep-rooted climbers. These two species not only check the growth of cotton plants but also pose many difficulties to the cotton pickers (Phutti) due to inter mingling with the crop. *Convolvulus arvensis* (vern. Narro) and *Cucumis melo*(vern. Mitero) are often climbing weeds found in cotton crop.

Trianthema portulacastrum most dominant and common weed spreading in meters. Consequently, it occupies more space underneath cotton. It is also

considered as a poisonous plant because of its high oxalate content and reputed as a salt exudating in nature. One plant can produce more than 50,000 seeds per year.

Brachiaria eruciformis and *Datyloctenium aegyptium* annual and herbaceous species of family poaceae found more abundant throughout the area under study. *Euphorbia serpens*, a common herbaceous weed with milky juice grows abundantly in all type of soil and along roadsides causing potential threat to cotton crop.

Memon (2000) reported *Phragmites karka* as a weed in wheat crop for the first time in Pakistan. It is a perennial plant, attains height more than 3 meters. Its occurrence is mostly common along roadsides where there is a moist place or water logged areas as well as besides canals. The verbal/personal communication with farmers reveals that it become a serious cause of concern since few years because of its mode of infestation. The germination of this plant takes place through tillers or even its small portion (creeping Rhizomes) left over in the subsoil is capable to reproduce a new plant and may become a potential threat in the coming years. It is spreading at an alarming rate.

Apart from this potential menace, these weeds also have some importance as fodder for the sustenance of livestock. Cattle Farmers collect such these plant species from the cotton crop as green pastures. This practice contributes in two ways. At one hand it is hand weeding, resulting in decrease of weed population from the crop. On the other hand it provides pastures for cattle. Personal observation reveals that the cattle owners depend on these weeds during Kharif season since no other major green pastures is cultivated in this season.

The above discussion depicts the weed biology, their threats posed for the cotton crop in addition to their little contribution as a fodder.

Table 1. Showing the Threats to Cotton Crop.

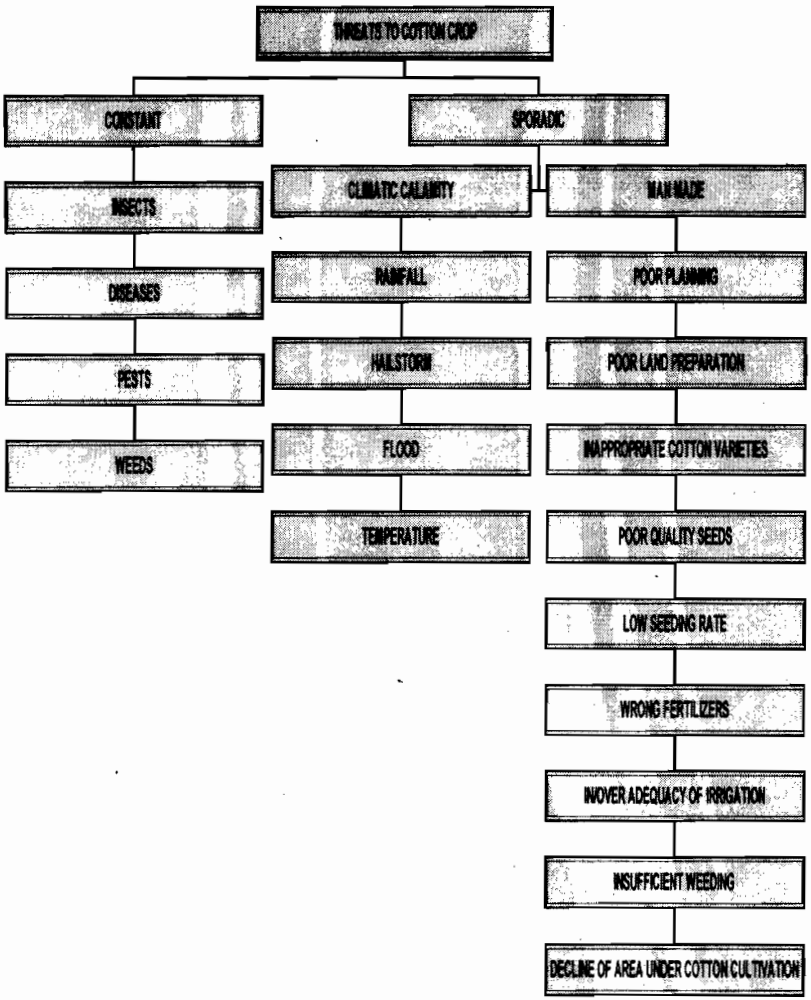

Table 2. Showing the list of Weeds of Cotton Crop.

	BOTANICAL NAME	LOCAL NAME	FAMILY
1.	*Trianthema portulacastrum* Linn.	Waho	Aizoaceae
2.	*Digeria muricata* (Linn.) Mart.	Lulur	Amaranthaceae
3.	*Celosia argentea* Linn.	Bobak	Amaranthaceae
4.	*Amaranthus virdis* Linn.	Mareiaro	Amaranthaceae
5.	*Oxystelma esculentum* (L.F.)R.Br.	Phulli	Asclepidiaceae
6.	*Conyza bonariensis* (Linn.) Cronquist	Paleet	Asteraceae
7.	*Launea nudicaulis* (Linn.) Hook	Bhattar	Asteraceae
8.	*Xanthiun stromarium* Linn.	Bhart	Asteraceae
9.	*Eclpta alba* (Linn.) Hassk.	Daryai booti	Asteraceae
10.	*Cleome viscosa* Linn.	Kini booti	Capparidaceae
11.	*Ipomea aquatica* Forssk.	Naro	Convolvulaceae
12.	*Cressa cretica* Linn.	Oin	Convolvulaceae
13.	*Convolvulus arvensis* Linn.	Narro	Convolvulaceae
14.	*Cucumis melo* Linn.	Mitero	Cucurbitaceae
15.	*Cyperus rotundus*Linn.	kabbah	Cyperaceae
16.	*Euphorbia serpens* Kunth.	Kherowil	Euphorbiaceae
17.	*Sesbania aculeate* ?????	Akar	Papilionaceae
18.	*Cynodon dactylon* (Linn.) Pers.	Chabbar	Poaceae
19.	*Brachiaria eruciformis* (J.E. Sm.) Stap	Sawari	Poaceae
20.	*Desmostachya bipinnata* (Linn.) Stap.	Dabh	Poaceae
21.	*Dactyloctenium aegyptium* (Linn.) Willd.	Gandhir gah	Poaceae
22.	*Phragmites karka* (Retz.) Trin. ex Steudo	Narro	Poaceae
23.	*Setaria pumila* (Poir.) Roem. & Schult.	Sawari	Poaceae
24.	*Corchorus aestuans* Linn.	Dataihari	Tiliaceae
25.	*Corchorus tridens* Linn.	Dataihari	Tiliaceae
26.	*Phyla nodiflora* (Linn.) Greene	Bukan	Verbenaceae
27.	*Tribulus terresteris* Linn.	Bakhro	Zygophyllaceae

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