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MAJOR RABI AND KHARIF WEEDS OF AGRONOMIC CROPS OF DISTRICT BANNU

Naeem Khan, Ikramullah Khan, Muhammad Azim Khan and Haroon Khan[1]

ABSTRACT

A survey was conducted in district Bannu during July, 2002, to collect information about the distribution and management of major rabi, kharif and parasitic weeds. From 11 villages, 33 farmers (3 from each) were randomly selected for interviews to learn about their knowledge and perceptions about weeds, their control strategies and constraints. The data recorded from the prepared questionnaire indicated that wheat and gram were the major rabi crops of the surveyed area as these crops are grown by 100 and 60% of the farmers, respectively. Similarly maize and sorghum are the important kharif crops of the surveyed area as they are grown by 66 and 36 % of the sampled farmers, respectively. A total of 15 weeds were reported as problem weeds from the surveyed area. The farmers of the surveyed area had not reported the infestation of any crop with *Orobanche* or *Cuscuta*. Only the infestation of the trees of *Zizyphus jujuba* (Ber) by *Cuscuta* and that of *Tamarix* trees by *Orobanche* was reported. Cutting of the infested branches of *Z. jujuba* for the control of *Cuscuta* is the only mechanical method that the local farmers of the surveyed area apply to control *Cuscuta* while there is no control of *Orobanche* which infests *Tamarix* trees because the farmers of the area are unaware of its weedy characteristics. There seems to be a lack of information regarding chemical weed control. Some basic problems and difficulties were reported by the sampled farmers of that area. Among those the main constraint reported is that the modern agricultural production practices are increasing weed density per unit area. Irrigation water deficit, high electricity charges of tube wells and high charges of agricultural machinery were listed as the problems faced by the farmers. Moreover, the farmers of the studied area used a number of weeds as a fodder and green vegetables.

Key words: Kharif/Rabi weeds, Bannu, NWFP Cuscuta, Orobanche

INTRODUCTION

A weed can be defined as those plants whose negative values outweigh their positive values. Weeds can be categorized as annuals, biennials and perennials which are responsible for the production decrease per unit area in various agricultural crops and forests. Weeds are further divided into Rabi and Kharif weeds. Rabi weeds infest the rabi season crops, while kharif weeds infest the kharif crops. The majority of weeds are annuals with high reproductive potential (Grime, 1979, Walker and Evenson, 1985; Eberlein *et al.*, 1988). In developing countries like Pakistan, agriculture and forests are

1 Department of Weed Science, NWFP Agricultural University, Peshawar – Pakistan.

playing an important role for its economy. Majority of the population of Pakistan is living in the rural areas and their dependence is mainly on agricultural products. The cultivated area of agriculture and forests are decreasing rapidly due to growing population, so the available resources are not sufficient to fulfill the requirements of the growing population. There are several reasons which are responsible for the low production of agricultural crops and forest among which the most important one is the increasing problem of the weeds. The concept of weeds as unwanted plants was born when man started to deliberately grow plants for food. Weeds reduce production of crops through competition for nutrients, water, light and space. Specific damages caused by weeds include a lower crop yield, less efficient use of land, higher cost to control insects and plant diseases, poor quality products, more water management problem and lower human efficiency (Klingman and Ashton, 1982). Most of the weeds are more competitive than the crop plants (Fitter and Hay, 1981). In a field experiment, Khalid (1988) found that *Carthamus oxyacantha*, *Euphorbia helioscopia* and *Fumaria indica*, when allowed to grow in wheat under rainfed conditions, contained high percentage of nitrogen than the crop plants. There are many other reports which reinforce the intensive losses caused by weeds in terms of yield because of competition for nutrients and water (Yadav *et al.*, 1985; Williams and Hayes, 1981). Some of the alien invasive plants species like *Broussonetia papyrifera* are not only reduce the land value and causing economic losses to agriculture but are also source of allergy and health problems in Islamabad and Peshawar. *Carthamus oxyacantha*, not only reduces cereal and chickpea production but also hinders in harvesting. *Allium vineale* and *Asphodelus tenuifolious* are weeds which cause yield losses and deteriorate milk quality of the lactating animals as well. Parasitic weeds like *Orobanche*, *Cuscuta* and Mistletoes etc. also decrease crops and forest trees production. Marwat *et al.* (1993) reported 54 parasitic weeds in Pakistan. Marwat, 1992 stated that various corps are parasitized by *Cuscuta* including onion.

Weeds were introduced through invaders either brought inadvertently through seed import and spread through water, wind, animals and through agricultural machinery. Moreover, some ecological disturbances, like diseases, fire and cleaning of the land etc make changes at micro and macro-climatic level and consequently open up niches for new alien and invasive weeds. Marwat (1984) reported a total of 284 weeds from NWFP. Hashim and Marwat (2002), reported 16 invasive weeds from Abbotabad. Weed interference is one of the important but less noticed constraints, responsible for low yield of wheat in Pakistan. It has been estimated, that annual losses caused by weeds in Pakistan amount to Rs. 1150 millions, which are little more than those caused by diseases (Haq, 1970). Whereas weed losses in wheat alone have exceeded 25 billion during, 1998 (Marwat, 1998). Agricultural researchers have found that weeds cause 17-25% losses in wheat annually, Shad, 1987). Hashim and Radosevich, 1991, also quantified a decline in wheat production with increasing Italian ryegrass densities. Carlson (1986) also outlined the wheat yield losses due to *Avena fatua*. Similarly some trees which release allelochemicals into the environment inflicting the bad affect in farm forestry (Hussain *et al.*, 2000). The losses on annual basis in wheat amount to more than 28 billion at national and 2 billion on NWFP level. In maize and rice the losses on annual basis were amounted to more than 6.3 and 4.9 billions at national and 3.2 and 1.2 billions at provincial (NWFP) level, respectively, (Hassan and Marwat, 2001).

Therefore, the present study thus conducted would enable to evaluate the extent and nature of weed. Problem in rabi and Kharif crops as well as forest trees of Bannu district.

MATERIALS AND METHODS

The methodology employed in the study areas consisted of two stages, the initial information collected and formal survey.

Initial information collected

In this stage the initial information regarding the study area and the problems into focus were collected from different sources, like farmers and visual examination etc. The objective of the activity was to identify important issues and problems faced by the farmers with an emphasis on weeds to be later investigated during interview.

Research site and sample design

The study was conducted in 11 villages of district Bannu. From each village three farmers were randomly selected for detailed interview. During the survey, personal observations were also recorded, regarding the different weeds. The data obtained from these questionnaires and personal observations are presented in the form of tables and discussed subsequently.

Informal and formal survey

Informal survey was conducted in order to get maximum information from the selected farmers that could help in improving the interview schedule. Data were collected through a comprehensive interview schedule by conducting formal survey.

Limitations of the study

The researchers faced some problems during the data collection that could affect the results of the study. These problems were:

1. Most of the farmers are illiterate, and thus their proper communication with the researchers was very difficult.
2. Due to their suspicious behavior, about the purpose of the study, some information provided by the farmers may be false.
3. Unawareness about the weeds, their losses, use and control could limit the scope of information.

RESULTS AND DISCUSSION

The data/information collected while surveying the study area is presented in separate Tables. The perceptions about the way *Orobanche and Cuscuta* infest the trees and major problems of the farmers are presented. Efforts have been made to present the findings in a comprehensive manner for drawing the conclusions.

CROPPING PATTERN AND INTENSITY OF WEED INFESTATION:

Major Rabi Crops

Table 1(a) shows that the major Rabi crops in the study area are wheat *(Triticum aestivum)*, gram *(Cicer arietinum)*, rapeseed and mustard *(Brassica* spp.*)*, barley *(Hordeum vulgare)*, onion *(Allium cepa)*, shaftal *(Trifolium resupinatum)* and vegetables. The number and Percentage of farmers responded in favor of the above rabi season crops cultivated in the current year or at least in the previous year were 33 (100%) for wheat, 20 (60%) for gram , 8(24.20%) 8(24.20) for rapeseed and mustard, 4(12.12) for

onion, 4(12.12) for shaftal, 2(6.00) for vegetables, 1(3.00) for canola and 1(3.00) for berseem. Hence, wheat and Gram are grown on large area and are more important crops of the study area because these are used as staple food and cash crops, respectively. Moreover, these crops are well adapted to the local environmental and socio-economic conditions.

Table-1(a). Major rabi crops of the surveyed area

S. No.	Crops	No. of Respondents	Percentage
1	Wheat	33	100
2	Gram	20	60
3	Barley	8	24.20
4	Rapeseed and Mustard	8	24.20
5	Onion	4	12.12
6	Shaftal	4	12.12
7	Vegetables	2	6.00
8	Canola	1	3.00
9	Berseem	1	3.00

Major Kharif Crops

Table 2(a) showed that major kharif crops sown in the surveyed area were Maize *(Zea mays* L.*)*, Sorghum *(Sorghum bicolor* L.*)* [Fodder/Grain], Bajra (Pennisetum typhoides) , Mung bean *(Vigna radiata* L. Wilczek.*)* and Sesame *(Sesamum indicum* L.*)*. The number of growers and their percentage (%), who have cultivate the crop, this year or at least in the previous year were 22(66%) for maize, 12(36) for Sorghum,7(21)for bajra,6(18) for mungbean and 4(12) for sesame. Because of the grain and fodder values, maize is the major kharif crop of the area.

Infestation of *Orobanche* and *Cuscuta*

Table 3(a) showed that the infestation of *Orobanche* was recorded 21% on *Temarex* tree and non of crop was reported that is infested by the *Orobanche*.

Table 3(b) showed that the infestation of *Cuscuta* was reported by 30% of the farmers on *Zizyphus jujuba* tree and none of the cultivated crops was infested by *Cuscuta*.

Uses of weeds by the farmers of the target area

The local farmers of the survey area were not familiar about the uses of all the identified weeds. However, some of the species are in their use either as medicines, fodder, and fuel etc. These are summarized in the Table 4.

Major problems of the farmers of the studied area

Major problems of the farmers of the studied area are presented in table 5.Due to these problems the farmers are away from getting the potential yields of the growing crops. While performing the survey farmers of that area has mentioned different problems which they are facing in their farming. Deficiency of water for irrigation and different weeds infesting different crops were reported by 100% of the farmers. They also reported the other major problems like, unavailability and high prices of the agrochemicals, unavailability of certified seed, high per hour charges of tilling and threshing machinery, rodents and grazing animals and those of land partitioning problem.

Table 1 (b). Major weeds of rabi crops in the surveyed area

Rabi crops	Major Weeds	No. of respondents	% age
Wheat	*Convolvulus arvensis*	20	60.60
	Carthamus oxyacantha	25	75.75
	Cynodon dactylon	9	27.27
	Avena fatua	24	72.72
	Asphodalus tenuifolius	6	18.18
	Aanagallis arvensis	9	27.27
	Gallium aparine	18	54.54
	Chenopodium album	7	21.21
	Cyperus rotundus	3	9.10
	Cirsium arvense	2	6.10
	Fumaria indica	2	6.10
	Medicago denticulata	1	3.03
	Euphorbia helioscopia	3	9.10
	Phalaris minor	3	9.10
	Alhagi maurorum	1	3.03
Barley	*Convolvulus arvensis*	7	21.21
	Galium aparine	3	9.10
	Carthamus okmjuxyacantha	5	15.15
	Anagallis arvensis	2	6.10
	Avena fatua	1	3.03
	Cyperus rotundus	1	3.03
	Chenopodium album	2	6.10
Rapeseed and Mustard	*Convolvulus arvensis*	7	21.21
	Chenopodium album	4	12.12
	Carthamus oxyacantha	3	9.10
	Alhagi maurorum	1	3.03
	Anagallis arvensis	1	3.03
Gram	*Asphodelus tenuifolius*	18	54.54
	Astragalus bekeliensis	11	33.33
	Cynodon dactylon	9	27.27
	Carthamus oxyacantha	5	15.15
	Convolvulus arvensis	9	27.21
	Anagallis arvensis	1	3.03
Onion	*Convolvulus arvensis*	3	9.10
	Chenopodium album	3	9.10
	Anagallis arvensis	2	6.10
	Carthamus oxyacantha	1	3.03
	Fumaria indica	1	3.03
Vegetables	*Rumex crispus*	2	6.10
	Euphorbia helioscopia	1	3.03
	Connvolvulus arvensis	2	6.10
	Chenophodium album	1	3.03
	Anagallis arvensis	1	3.03
Shaftal	Weeds were not a problem.	---	---
Fodders	*Carthamus oxyacantha*	3	9.10
	Convolvulus arvensis	1	3.03
	Anagallis arvensis	1	3.03

Table-2(a). Major Kharif Crops cultivated in the surveyed area

S.No.	Crops	No. of Respondents	Percentage (%)
1	Maize	22	66
2	Sorghum	12	36
3	Millet	7	21
4	Mung bean	6	18
5	Sesame	4	12

Table-2(b). Major Weeds of Kharif Crops in the surveyed area

Major Crops	Major Weeds	No. of Respondents	Percentage (%)
Maize *(Z. mays* L.)	*Eichinochloa crus-galli*	22	66.66
	Cyperus rotundus	6	18.18
	Amaranthus viridis	16	48.48
	Convolvulus arvensis	5	15.15
	Portulaca oleraceae	8	24.24
	Digitaria spp.	4	12.12
	Cucumis spp.	5	15.15
	Cynodon dactylon	2	6.10
Sorghum *(S. bicolor)*	*Amaranthus viridis*	4	12.12
	Cucumus spp.	1	3.03
	Cenchrus longispinus	1	3.03
Mungbean *(V. radiata)*	*Amaranthus viridis*	5	15.15
	Cenchrus longispinus	2	6.10
	Poa spp.	1	3.03
	Cyperus rotundus	1	3.03
	Eichinochloa crus-galli	1	3.03
Pearl Millet *(P. typhoides)*	*Amaranthus viridis*	5	15.15
	Portulaca oleraceae	2	6.10
	Tribulus terrestris	1	3.03
Sesamum *(S. indicum)*	*Amarantus viridis*	3	9.10

Table-3(a). Crops and trees infested by *Orobanche*

S.No	Crop/Tree	No. of Respondents	% age
1	*Temarix* tree	7	21
2	Crops	0	0

Table-3(b). Crops and trees infested by *Cuscuta*

S.No	Crop/Tree	No. of Respondents	% age
1	*Zizyphus jujuba* (tree)	10	30
2	Crops	0	0

Table-4. Uses of weeds by the farmers

Weed species	Uses
Cynodon dactylon	Fodder and grown in lawns as ornamental.
Convolvulus arvensis	Fodder and used as anti constipation.
Avena fatua	Fodder and fuel.
Chenopodium album	Fodder and green vegetable.
Fumaria indica	Fodder and cooling agent.
Phalaris minor	Fodder and fuel.
Rumex crispus	Vegetable/salad and as digestive plant.
Ecchinochloa crus-galli	Fodder and birds feed.
Portulaca oleareacoa	Green vegetable and fodder.
Tribulus terristris	Fodder and seeds are used in the diseases. of the bladder and kidney stone.
Orobanche	Used for ulcer treatment.

Table-5. Major problems of the farmers.

Type of problem	No. of Respondents	% age
• Weeds problem	33	100.00
• Irrigation water deficit	33	100.00
• Unavailability, adulteration and high price of Agrochemicals	27	81.80
• Unavailability of certified seed	22	66.66
• Animals/rodents/birds	17	51.15
• Salinity	12	36.36
• Tillage and cultivation high charges (per hour)	5	15.15
• Threshing high charges(per hour)	5	15.15
• Expensive labor	3	9.00
• High electricity bills (per month)	2	6.06
• Expensive fertilizers	2	6.06

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