

SURVEY ON WEED PROBLEMS IN WHEAT CROP IN DISTRICT MARDAN*

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ABSTRACT

Surveys were conducted during mid and late seasons of wheat crop regarding weed problem in wheat crop in district Mardan during 2003-04, using a specific format of a questionnaire (Appendix-I) alongwith personal observations. A total of 100 farmers from 5 villages (20 farmers from each village) were randomly selected and interviewed using the questionnaire. In Mardan, the major weeds reported were *Madicago denticulata*, *Mellilotus parviflora*, *Avena fatua*, *Cirsium arvense*, *Phalaris minor*, *Lolium sp.*, *Carthamus oxyacantha*, *Silybum marianum*, *Convolvulus arvensis*, *Malcolmia africana*, *Galium aparine*, *Fumaria indica*, *Vicia sativa*, *Chenopodium album*, and *Anagallis arvensis* etc. Annual wheat yield losses due to weeds ranged from 25-50%. Forty six percent of the farmers regarded weeds as the most important constraint related to wheat production. Almost, 59% of the farmers used chemical method of weed control. Moreover, 53% of the farmers reported increase in weed infestation during last ten years. The grain yield reported was in the range of 500-2500 kg ha⁻¹

Key words: Wheat crop, weeds, weeds losses and control.

INTRODUCTION

Agriculture is the backbone of Pakistan, employing 50% of the total labor force at national level and contributing 25% to GDP and 85% to export earnings. Wheat, rice, cotton and sugarcane are the major crops occupying more than 21 million hectares land in irrigated and rainfed areas. Wheat has a unique position among the cultivated crops. Firstly, it is grown on a larger area as compared to other crops. Secondly, it provides more carbohydrates and proteins in the world diet than any other crop. Thirdly, the world wheat trade exceeds all other crops combined. At the national level, during 2004-05, the area under wheat cultivation was 8.358 million hectares with a production of 21.612 million tons and in NWFP the area was about 0.749 million ha with production of 1.091 million tons. One third of this area was irrigated, while two third was rainfed (MINFAL, 2005).

Weed interference is one of the important constraints, contributing towards low yield of wheat in Pakistan because insects and diseases are not a significant problem in wheat. About 75% population is residing in rural areas. Being Agriculturists, it is our responsibility to produce the food with such increased rate that could fulfill the food requirements of the bulging population. Vertical improvement is the only way because of having enough room to get the maximum yield from the existing cultivars of wheat as horizontal improvement is impossible.

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^{*} The research was funded by PSF Project on "Management of Weeds in wheat in NWFP
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The rusts and smuts problem is controlled due to incorporation of resistance genes in the wheat cultivars. Thus weeds are the only pest left, which are impeding our efforts. Weeds deprive the crop plants of the nutrients, moisture, light, CO₂ and space, while many of the weeds also possess allelopathic properties for crops and effect even germination also. The annual losses to wheat crop in Pakistan on monetary basis amounts Rs.28 billions, while in NWFP it amounts to Rs.2 billions (Hassan and Marwat, 2001 and Marwat, 2002). These figures deserve an efficient weed management. As far as mechanical control of weeds is concerned, it is more laborious, time consuming and weather dependent. So chemical weed control may be the only alternative left. Newly herbicides like Topik and Puma super effectively manage the grassy weeds particularly wild oats and little seed canary grass and have proved very effective as compared to mechanical control (Workayehu, 2000).

Among the weed control methods, the chemical weed control is one of the recent origins, which is being emphasized in modern agriculture (Taj *et al.* 1986). Different studies are available on chemical weed control in wheat like Khan *et al.* (1999), Khan *et al.* (2004) and Hassan *et al.* (2003). It is of utmost importance to personally observe as well as investigate the farmers' indigenous knowledge about the weeds problems in wheat crop like wheat yield losses, weeds density, frequency and canopy coverage etc. at different locations of NWFP. The study location was the area where wheat is intercropped traditionally with sugarcane crop.

METHODOLOGY

Survey was conducted during mid and late seasons of wheat crop in Mardan district to assess the damage level and to formulate the concept of local farming community about the weed management and methods used by them to tackle the weed problem so as to identify the reasonable deficiencies. The other purpose of the survey was to personally observe the problem weeds in the wheat crop and their possible impact on wheat crop. The farmers were personally interviewed by using the questionnaire. The surveys were conducted twice in 5 representative villages including Shero Dheri, Kotki, Baghdada, Gadar and Jamal Ghari (20 farmers from each village were contacted). Thus, a total of 100 farmers were interviewed in mid season and 100 farmers in the late season of wheat production. The visits to the representative field of the farmers verified the problem weeds in wheat crop at the aforesaid locations. The format of the questionnaire is given in Appendix-I.

RESULTS AND DISCUSSION

The villages included in the surveys were Shero Dheri, Kotki, Bughdada, Gadar and Jamal Ghari. The surveys were conducted according to the given methodology using questionnaire as well as visual observations. The following parameters were studied.

Problem weeds of wheat

The major weeds that infested the wheat intercropped with sugar cane crop were reported as *Madicago denticulata*, *Melilotus parviflora*, *Avena fatua*, *Cirsium arvense*, *Phalaris minor*, *Lolium sp.*, *Carthamus oxyacantha*, *Silybum marianum*, *Convolvulus arvensis*, *Malcolmia africana*, *Galium aparine*, *Fumaria indica*, *Vicia sativa*, *Chenopodiumalbum* and *Anagallis arvense* (Table-1).

Table-1. Major common weeds of wheat intercropped with sugarcane in District Mardan during 2003-04.

Major weeds of wheat crop	Number of respondents (%)
<i>Medicago denticulate</i>	83
<i>Avena fatua</i>	75
<i>Cirsium arvense</i>	73
<i>Melilotus sp.</i>	71
<i>Phalaris minor</i>	66
<i>Lolium sp.</i>	51
<i>Carthamus oxyacantha</i>	47
<i>Rumex sp.</i>	42
<i>Silybum marianum</i>	41
<i>Convolvulus arvensis</i>	39
<i>Coronopus didymus</i>	27
<i>Malcolmia sp.</i>	26
<i>Galium aparine</i>	23
<i>Fumaria indica</i>	22
<i>Vicia sativa</i>	19
<i>Chenopodium sp.</i>	17
<i>Euphorbia helioscopia</i>	13
<i>Anagallis arvense</i>	11

Wheat yield losses due to weeds

Different farmers reported wheat yield losses due to weeds differently. About 44% farmers reported 20-30% yield losses in wheat, 30% of the farmers reported 31-40% and 17% farmers reported 41-50% wheat yield losses as given in the Table-2.

Table-2. Yield losses in wheat intercropped with sugarcane in District Mardan during 2003-04.

Yield losses range (%)	Number of respondents (%)
20-30	44
31-40	30
41-50	17
>50	9

Important constraints of wheat production

The questionnaire included some constraints playing role in yield reduction of wheat. These constraints were weeds, quality seeds, agrochemicals, irrigation water and others. Forty six percent of the farmers reported weeds as an important constraint in

wheat production. Some farmers reported tree plantation at the borders of each field that shades the adjacent field and causes yield reduction also (Table-3).

Table-3. Production constraints in wheat intercropped with sugarcane in District Mardan during 2003-04.

Production constraints	Number of respondents (%)
Weeds	46
Agrochemicals	28
Quality seeds	15
Water for irrigation	21
Tree plantation	20
Termites	12
Late sowing due to sugar cane	26

Weeds control strategies

Among all the respondents interviewed, it was reported that 59% farmers were practicing chemical weed control and 32% of the farmers were using mechanical method of weed control. However, the mechanical method is considered as the traditional method of weed control including mowing by sickle, hand pulling and hoeing etc. Nine percent of the farmers were reported as practicing no weed control.

Tracking Weeds Infestation

The farmers were asked about the weeds infestation in the last ten years. Fifty three percent of the farmers reported that weeds have increased over the last ten years, but 23% of them reported decreasing and 24% of the respondents reported that weed infestation has remained to be the same as before.

Harvested yields of wheat

The farmers reported the yield in kg ha⁻¹. Out of which 15% of the respondents reported their yield as 500-1000 kg ha⁻¹, 55% of them reported their yield as 1100-1500 kg ha⁻¹ and 22% reported as 1600-2000 kg ha⁻¹.

CONCLUSIONS AND RECOMMENDATIONS

In the light of the survey it is concluded that the local farmers' indigenous knowledge is of great importance for preparing a weed management package for a particular locality. For this purpose an inventory of the major common weeds in wheat in the area is made. Big farmers expressed their willingness for maximum investment for getting increased yield through advance package of technologies if they could be assured of more income. Farmers having small holdings, lower socio-economic status and meager amount of money preferred mechanical weed control through family members. However, they readily accepted the need to replace it with an efficient and less laborious weed control methods. Similar survey studies should be carried out for timely information and resolution of issues and problems related to the farming system. A panel of experts including Botanists and Weed Scientists should arrange workshops and field days at the door steps of the farming community regarding the identification of the newly introduced weeds.

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APPENDIX-I

QUESTIONNAIRE USED FOR INTERVIEWS

- S. NO. _____ Village _____ Date _____
1. Name of respondent _____ Gender _____
Education _____ Age _____ Household size _____
 2. Tenure: (a) Owner (b) Owner-cum-tenant (c) Tenant (d) Leasee
 3. Major Rabbi crops _____ Major weeds _____

 4. Major Kharif crops _____ Major weeds _____

 5. Do you grow Wheat? Y/N If not why _____
 6. Wheat sowing time _____ Best sowing time _____
 7. Rain fed /Irrigated _____ Estimated Yield _____
 8. Major weeds in wheat in order of severity (a) _____ (b) _____
(c) _____ (d) _____ (e) _____
 9. Last grown Crop _____ Next Crop _____
 10. Crop Rotation with Wheat Y/N If yes What _____
 11. Inter Cropping Y/N If yes Which Crop _____
 12. What are Major constraints related to Wheat production
(a) weeds (b) Quality seeds (c) Agrochemicals (d) water for irrigation (e) tax
(f) others _____
 13. Uses of weeds. Fodder/medicine/fuel/others _____
 14. If weeds are a problem what are the estimated yield losses due to weeds?

 15. Do you control weeds? Y/N. If yes, how?
Chemical Y/N What herbicides _____
Others _____
 16. Which method do you consider the best _____ why _____
 17. How you see the weeds problem over the past 10 years?
Increasing/ decreasing/ same. If increasing/decreasing which weed(s)
(a) _____ (b) _____ (c) _____ (d) _____
New introduction _____