

SURVEY ON WEED PROBLEM IN WHEAT CROP IN DISTRICT CHITRAL (A HIGHER ALTITUDE AREA) OF NWFP-PAKISTAN*

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ABSTRACT

A survey was carried out during wheat crop season 2003-04 to assess weeds problem in wheat crop in district Chitral, using a specific format of a questionnaire alongwith personal observations. A total of 100 farmers from 5 villages (20 farmers from each village) were randomly selected and interviewed using the said questionnaire. The major weeds reported were Avena fatua, Bromus sp., Convolvulus arvensis, Galium aparine, Sinapis arvensis, Lolium sp., Rumex sp., Chenopodium sp., Stellaria media, Setaria sp., Poa annua and Vicia sp. The yield reduction according to the farmers in wheat crop due to weeds ranged between 25 to 50%. Sixty six percent (66%) farmers considered weeds as the most important constraint in wheat production in the area. Manual weed control method was reported as major weed control method; moreover, 68% of the farmers reported that weed infestation escalated in the last decade. The local farmers also reported the crop yield in the range of 500 and 2500 kg ha⁻¹.

Key words: District Chitral, wheat, weeds, Pakistan.

INTRODUCTION

In Pakistan, wheat yield ha⁻¹ is unfortunately very low and actual farm yield is about 30-35% of the potential yield. Weed interference is one of the important but less noticed constraints, contributing towards low yield of wheat in Pakistan. Seventy five percent (75%) of the total population resides in the rural areas. Our population is increasing at one of the fastest rate in the world. Our food production should fulfill the food requirements of our population. It is impossible to increase the crop area because the cultivated

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area is already squeezing. Vertical improvement is only possibility to get the potential yield of the existing wheat cultivars. At the national level, during 2004-05, the area under wheat cultivation was 8.358 million ha, with a production of 21.6123 million tons. In NWFP, the area under wheat cultivation was about 0.7486 million ha in which one third is irrigated, while two third is rain fed giving a total production of 1.091 million tons at the rate of 1458 kg ha⁻¹ (MINFAL, 2005). Weed competition is the only constraint for the wheat yield because insects and diseases are not so significant problems. Weeds deprive the crop plants of the nutrients, moisture, light, CO₂ and space, while many weeds also possess allelopathic effects for crops. Weeds cause 17-25% losses in wheat annually (Shad 1987) and 17-50% (Anonymous 1998). Among the weed control methods, the chemical control is one of the recent origins, which is being emphasized in modern agriculture (Taj *et al.* 1986). The annual losses to wheat crop in Pakistan on monetary basis amount to Rs. 28 billions, while in NWFP it amounts to Rs. 2 billions (Hassan and Marwat 2001 and Marwat 2002). These figures warrant an efficient control of weeds. The major weeds competitive with wheat crop in NWFP include: *Avena fatua*, *Phalaris minor*, *Cirsium avense*, *Convolvulus arvensis*, *Ammi visnaga*, *Chenopodium album*, *Carthamus oxyacantha*, and *Euphorbia helioscopia* (Hassan *et al.* 2003). It is of utmost importance to personally observe as well as investigate the farmers' indigenous knowledge about the weeds problems i.e. weeds infestation in wheat crop, wheat yield losses due to weeds, weeds density, frequency and canopy coverage. The locations studied are higher altitude areas of wheat production. For this purpose conducting surveys was very necessary in district Chitral, NWFP to document the indigenous knowledge of the local farming community.

METHODOLOGY

Diagnostic study was carried out during the wheat crop season 2003-04, in district Chitral to assess the damage level and the concept of local farming community about the weeds and the management tools used by them to tackle the weeds so as to identify the reasonable deficiencies. The surveys were conducted in 5 representative villages viz; Shaghoor valley, Seen lasht, Bamburet (Kalash Valley), Singur, and Booni lasht. Twenty farmers from each village were contacted in the district, thus a total of 100 farmers were interviewed. The visits to the representative farmers' fields verified the problem weeds in wheat crop. The problem weeds in wheat crop were also personally observed after the farmers' comments to study the impact of the weeds on wheat crop inside the field situations. The farmers were interviewed using the questionnaire (Appendix-).

RESULTS AND DISCUSSION

The following parameters were studied:

Problem weeds of wheat in the locality

The major weeds that were reported to infest wheat crop in the district of Chitral were *Avena fatua*, *Bromus* sp., *Convolvulus arvensis*, *Galium aparine*, *Sinapis arvensis*, *Lolium* sp., *Rumex* sp., *Chenopodium* sp., *Stellaria media*, *Setaria* sp., *Poa annua*, *Medicago* sp. *Vicia* sp., *Coronopus didymus*, *Euphorbia helioscopia* and *Fumaria indica* (Table-1).

Table-1. Major common weeds of wheat crop in District Chitral during 2003-04.

Major weeds of wheat crop	Number of respondents (%)
<i>Avena fatua</i>	85
<i>Bromus</i> sp.	81
<i>Convolvulus arvensis</i>	80
<i>Galium aparine</i>	75
<i>Sinapis arvensis</i>	68
<i>Lolium</i> sp.	62
<i>Rumex</i> sp.	51
<i>Chenopodium</i> sp.	43
<i>Stellaria media</i>	41
<i>Setaria</i> sp.	38
<i>Poa annua</i>	35
<i>Medicago</i> sp.	28
<i>Vicia</i> sp.	27
<i>Coronopus didymus</i>	18
<i>Euphorbia helioscopia</i>	15
<i>Fumaria indica</i>	13

Wheat yield losses due to weeds

The magnitudes of yield losses were reported differently by different farmers in the area surveyed. About 54% farmers reported 20-30% yield losses in wheat, 31% of the farmers reported 31-40% losses and 15% farmers reported 41-50% losses as given in Table-2.

Table-2. Yield losses in wheat crop in District Chitral during 2003-04.

Yield losses range (%)	Number of respondents (%)
20-30	54
31-40	31
41-50	15

Important constraints in wheat production in the locality

The questionnaire also had some information about constraints which had played important role in wheat yield reduction in the locality. The constraints were: weed infestation, lack of quality seeds, Fake agrochemicals, lack of irrigation water and others. Sixty six percent (66%) of the farmers reported weeds as an imported constraint in wheat production. Further details are given in Table-3.

Table-3. Production constraints in wheat in District Chitral during 2003-04.

Production constraints	Number of respondents (%)
Infestation of Weeds	66
Lack of water for irrigation	45
Fake agrochemicals	41
Lack of quality seeds	35

Weeds control strategy of the local farmers

The local farmers reported only the mechanical method of weed control. The main mechanical methods used for weed control were mowing with sickle, hand pulling, hoeing etc. No chemical weed control method was reported due to lack of knowledge about the chemical use. Some 10% farmers even reported no weed control as they were also interested in the use of weeds for fodder purpose.

Weeds scenario

The farmers were asked about the weeds infestation in the last ten years. Almost 68% of the respondents reported that weeds have increased over the last ten years. 11% of them reported decrease and 21% of the respondents reported that weed infestation has remained the same in the last decade.

Local wheat yield

According to the questionnaire, the farmers reported the grain yield in their native measures which were then converted to kg ha^{-1} . Sixty two percent of the farmers reported their yield in the range of 1000-1500 kg ha^{-1} , 29% reported in the range of 1600-2000 kg ha^{-1} and 8% farmers reported yield between 2100 and 2500 kg ha^{-1} .

CONCLUSIONS AND RECOMMENDATIONS

The survey was carried out in order to document the weed infestation in wheat crop in the higher altitudes by interviewing the farmers and also through personal visual observations. Most farmers reported important information using their indigenous knowledge. Such study is helpful in networking the information among the farmers and researchers and this approach should be encouraged in the future as well. Similar survey studies should be carried out for timely information and resolution of issues related to the farming system. A panel of experts including Botanists and Weed Scientists should arrange workshops regarding the weed identification and their biology and also to identify new introductions of weeds in the locality.

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APPENDIX-I
QUESTIONNAIRE

- 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 _____