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Distribution and Importance of Weeds in Wheat, and Farmers' Practices to Manage Weeds at Chelia and Midakegn Districts

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Abstract

Assessment on the distribution and importance of weeds in wheat, and farmers weed management practices at Chelia and Midakegn Districts, West Shoa Zone, Oromiya National Regional State-Ethiopia was made during August to September 2012 main cropping season to identify, point out and prioritize problematic weeds and to determine impacts of weeds in small scale farmers' fields. The frequency, abundancy, and dominance for each species were calculated. For socio-economic study, purposively and systematically 218 farmers were interviewed regarding different aspects of weeds and weed management practices adopted in wheat fields of the study area, and have been documented as farmer's indigenes knowledge. The result revealed 93 weed species belonging to 33 families and 75 genera as weeds of wheat. The 10 major families based on number of taxa were: Poaceae (16), Asteraceae (14), five species each under Papilionaceae and Cyperaceae, three species each under Boraginaceae, Chenopodaceae, Commelinaceae, Convolvulaceae, Polygonaceae, and Solanaceae, and they contain 65% of the total weed flora. The most frequent, abundant and dominant weed species were found to be Polygonum nepalense, Pennisetum clandestinum, Cynodon dactylon, Plantago lanceolata, Hygrophilla auriculata, Galinsoga parviflora,Veronica filiformis, Cyperus rotundus, Spergula arvensis, Galium spurium, Trifolium pretense and Euphorbia hirta. Greater than 60% similarity index values of weed communities across all sampled locations were registered. Most of the farmers understand that weeds are the most important silent constraint on wheat production. They were found adopting different possible weed control measures to minimize the negative effect of weeds. However, the assessment work realized that no effective and sustainable weed control technology at their hand attracting future research effort to develop proper wheat weed management practices for the area.

INTRODUCTION

Wheat is the most important cereal and staple food in Ethiopia accounting about 14% of the produce and 3% of the agricultural GDP (CSA, 2002). As to a report it is cultivated on an estimated area of 2, 50,000 thousand hectares. Weeds are among factors which adversely affect the wheat production.

Although crop yield losses from weeds vary from crop to crop and from region to region, because of biotic and abiotic factors, it has been estimated that weeds cause a yield loss of about 10% in developed countries and 25% in the least developed countries (Akobundu, 1987 Tamado, and Milberg, 2000).

Before making a decision about a solution to a weed problem it is needed to survey the area to document the indigenous knowledge of the community and also to visually confirm the existing situation.

Weed surveys made in the past in Ethiopia were general weed population surveys and collections. The most widespread and problematic weed species were determined based on observation and information gathered from farmers (IAR, 1985; IAR, 1986). Surveys were made by visual observation of weeds, noting an increase or decrease over time in specific crops, and taking a quadrat of a certain size in several places at random at any one time, and counting the particular weed species (IAR, 1986). According to Pohlan (1984) and Unger (1991), there are two kinds of surveys. One is a qualitative determination of weeds which involves simply determining the weed species, and identifying farmers' problems and control practices in an area. It does not indicate the infestation level or the degree of economic importance of the weeds. The other kind, a quantitative determination of weed species, is more informative and better recognized than the qualitative determination, as it reports characteristics or parameters which can be used to describe a weed community

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quantitatively. These parameters comprise frequency of species, abundance, dominance of the species, and a similarity of species in different crops and/or agro-climatic conditions (Pohlan, 1984; Unger, 1984). Therefore, weed surveys in wheat field was needed to determine the frequency, abundance, dominance and establish an efficient weed management system.

Hand weeding of grass weeds is difficult during early growth stages of the broadcast crop due to similar morphology with wheat. Ethiopian farmers tend to delay hand weeding until the weeds are distinguished from crop plants, thus exposing the crop to weed competition for an extended period (Tanner and Griref, 1995).

The indigenous knowledge of the farming community is less known by the decision and policymakers. Therefore it becomes imperative to assess wheat growing regions of Chelia and Mida Kegn districts and communicate and gather information regarding weeds and weed problems in the wheat fields. Farmers generally use herbicide like; 2-4.D and in few cases glyphosate and granstar for weed control in wheat. The importance of chemical weed control can't be ignored as far as weed management is concerned (Taj *et al*., 1986). Weeds are highly significant problem in wheat farms of Chaliya and Mida Kegn districts, but no comprehensive information is available with regard to their importance in the area. Therefore, assessing weed species distribution and importance in wheat and farmers perception of weeds and weed management practice on wheat production at Chelia and Mida Kegn districts are mandatory. The survey was conducted to point out the nature of weed infestation and importance of weeds that enable to document their distribution and density, document the farmers' indigenous knowledge regarding weed problems in wheat, and plan for weed science research or management program in the light of the information gathered.

Material and Methods

During 2012/13 crop season, weed survey were carried out in districts of Chelia and Mida Kegn, West Shoa Zone, Oromiya National Regional State-Ethiopia, to assess the distribution, importance of weeds and gather information on perception of local farming community about the weed problem and the management practices used by farmers.

In general, geographical location of the study site lies between 8^0-10^0N latitude and 37^0-39^0E longitude. The altitude ranges from 1700 to 2851 meters asl. Based on climatic and topographic conditions, the area has been locally classified into highland (27%), mid-highland (50%), and lowland (23%). Soils of the study area are black, red, and intermediate types. In the area, mixed farming system is mainly practiced with large dependence on cereal crops (wheat, tef, maize, and barley) farming. But in terms of crop production wheat stands first followed by tef and maize in the two districts, accounting for the 24% of the cultivable land.

Sampling Technique

From each district, six representative sample peasant association kebeles were selected from major wheat growing areas located along the main road, and again in each kebele at five to ten kilometer intervals six representative small-scale farmers wheat fields were considered for weed assessment. In each field, weed assessment was made before any weed control measures applied once at early plant growth stage (30 to 50 days after sowing) of the crop by randomly throwing quadrat at about 3m distance. In each field, a pattern of an inverted W (Thomas 1985) was followed continuously for every 0.5 to 1.5 hectares farmlands and the numbers of samples per hectare were determined by the species-area curve and site condition (Pohlan1984 as cited by Taye et.al, 1998). The first quadrat (0.5mx0.5m) sample was taken following the procedure of Kevine et al. (1991), where the surveyor walking 50 paces along the edge of field, turning right angle, and walks 50 paces into the field and throwing the first quadrat and starting taking sample. In up to 16 randomly pointed samples the type and extent of weed species in wheat field were assessed and recorded. A handheld GPS was used to locate sampling points' latitude and longitude coordinates. Weed species in the field were identified using the available weed identification guides (Stroud and Parker, 1989).

For interview informal interview was conducted before formal once in order to get acquainted with ways of collecting information from farmers and also to decide the actual interview schedule. A total of 218 sample respondents were selected randomly from the list of farmers in the population of Chelia and Mida Kegn districts. The respondents comprised 53 females and 165 males, age ranging from 21 to 70 years. Both men and women that accounted for 76% and 24% the total sample size were interviewed, respectively. Thus, there was purposive and systematic sampling in all kebeles from each district. In addition, experts at district level and development agents at KA level were interviewed. During the interview, personal observations were also recorded regarding the different weeds.

Data collection and analysis

Both primary and secondary data were collected for the study. The primary data was collected from sample quadrats and through interviews with owner of the farm and agricultural officers. Interview data was collected through a comprehensive schedule by conducting formal interview. In addition, description of the field and locality, field history, field size, environmental conditions, and rainfall months were also recorded. Moreover, relevant documents, profiles, and reports from different published and unpublished sources obtained from respective districts' Agricultural Office were taken into consideration as secondary data.

To determine the nature of the weed problem in wheat communities, quantitative measures were calculated for each weed species in wheat based on the procedures followed by Thomas (1985), and Taye and Yohannes (1998).

A. Frequency: is the percentage of sampling spots in which a particular weed species is found.

$F = 100 * X/N$

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Where, F = frequency of particular weed species, X = number of samples in which a particular weed species occurs, N = total number of samples

B. Abundance: is the population density of a weed species expressed as the number of individual of that species per unit area.
(A)= (∑w)/N

Where, A = abundance, ∑w = sum of individuals of a particular weed species across all samples, N = total number of samples

C. Dominance: Abundance of an individual weed species in relation to total weed abundance
D = A * 100/ (∑W)

Where, D = dominance of a particular species, A = Abundance of the same species, ∑w = total abundance of all weed species

D. Similarity index (community index): is the similarity of weed communities between different locations, crops, soil types, or seasons as described by Taye and Yohannes (1998).
SI = 100 * Epg/ (Epg + Epa +Epb)

Where; SI = Similarity index, Epg = number of species found in both locations, Epa = number of species found only in location I (Chelia districts), Epb = number of species found only in location II (Mida Kegn districts)

For socio-economic parameters, the information obtained from the interviews was interpreted using tabulated mean and percentage.

Results and Discussion

Weed flora of Wheat Fields in Cheliya and Mida Kegn Districts

A total of 93 different weed taxa were collected from wheat fields of the survey area, of which 89 were identified to the species level. Among those 82 species were annuals, and 11 of them were perennials. Seedlings were sometimes very small at the time of data collection, and it was not always possible to identify closely related species. Therefore, the remaining 4 specimens (*Trifolium* spp., *Convolvulus* spp., *Argemone* spp., and *Ocimum* spp.) were identified only at the generic level. The weed species recorded were distributed in 78 genera within 33 families comprising 61 dicotyledonous species, 29 grasses, and 3 sedges (Figure 1). The 11 major families based on number of taxa were: Poaceae (21), Asteraceae (14), five species each under Cyperaceae and Papilionaceae , three species each under Boraginaceae, Chenopodaceae, Commelinaceae, Convolvulaceae, Polygonaceae and Solanaceae (Table 1). They contain 65% of the total weed flora. Therefore, the most dominant families' in terms of number of taxa represented were Poaceae and Asteraceae.

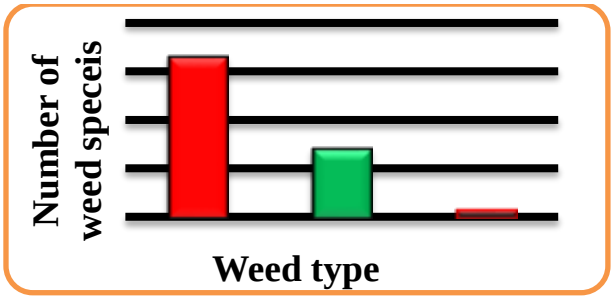

Figure 1. Number of weed species occurring under different weed major categories in wheat fields of Chelia and Mida Kegn districts, 2012

The result showed that in both districts, broadleaved weed species appeared to dominate over grasses and sedges. The greater number of species in *Poaceae, Asteraceae, Cyperaceae,* and *Leguminosae* might be due to their adaptability under a wider range of environmental conditions and soil types, growth behavior, prolific seed production, long-lasting dormancy and high competitive ability of the weed species under in these families. However, the identity and number of the weeds varied across different wheat fields.

Table 1. Number and proportion of weed species under the eleven predominant families at Chelia and Mida Kegn districts, 2012

No.	Family	Number of species	Percent of flora
1	Poaceae	21	21.65
2	Asteraceae	14	14.433
3	Cyperaceae	5	5.155
5	Papilionaceae	5	5.155
6	Boraginaceae	3	3.093
7	Chenopodaceae	3	3.093
8	Commelinaceae	3	3.093
9	Convolvulaceae	3	3.093
10	Polygonaceae	3	3.093
11	Solanaceae	3	3.093
	Total	63	65.04

Frequency, Abundance, and Dominance of Weeds in Wheat fields

The importance of weed species was determined by calculating the frequency, abundance, and dominance value of particular species. The major weed species having a dominance level greater than 3.61 in wheat fields irrespective of the soil groups and locations were *Polygonum nepalense, Plantago lanceolata, Veronica filiformis, Galinsoga parviflora, Galium spurium, Trifolium pretense, Spergula arvensis, Hygrophilla auriculata, Euphorbia hirta, Trichodesma zeylanicum, Heliotropium zeylanicum, Spilathes mauritiana, Rumex obtusitolium, Cirsium vulgare, Cynodon dactylon, Cyperus rotundus, Lolium temulentum, Hypericum perforatum, Pennisetum clandestinum, Eriochloa villosa,* and *Mariscus sieberianus.*

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The most frequently distributed species was *P. nepalense* covering almost 97% of the samples followed by *P. clandestinum*, C. *dactylon*, *P. lanceolata*, *H. auriculata*, *G. parviflora*, *V. filiformis*, *C. rotundus*, *S. arvensis*, *G. spurium*, *T. pretense*, *E. hirta*, and *T. zeylanicum*, which scored frequencies ranging from 23 to 81%. *P. nepalense* was also found to be the most abundant (45 p/m^2) in wheat fields of the area.

In general, there were positive and significant correlations between frequency, abundance, and dominance values of a particular weed species. Frequency of individual weed species ranged from 0 to 99%, while the dominance level ranged from 0 to 23% (Table 2). Weed species having frequency and dominance levels below 0.04% and 0%, respectively, were not included because they occur rarely and hence are unlikely to cause significant crop yield reduction except recently introduced invasive plant. The total abundance and species number in wheat fields of Chelia and Mida Kegn were 392 plants/m^2 (76 weed species) and 431 plants/m^2 (97 weed species), respectively.

Table 2. Weed species Frequency (F) Abundance (A) and Dominance (D) at Chelia and Mida Kegn districts, 2012

No.	Weed species	F	A	D
1	Polygonum nepalense	97.66	95.05	23.09
2	Pennisetum clandestinum	81.25	52.52	12.76
3	Cynodon dactylon	76.91	48.18	11.70
4	Plantago lanceolata	73.57	39.58	9.62
5	Hygrophilla auriculata	59.90	30.38	7.38
6	Galinsoga parviflora	51.65	26.95	6.55
7	Veronica filiformis	40.41	13.01	3.16
8	Cyperus rotundus	38.61	9.43	2.29
9	Spergula arvensis	37.96	8.40	2.04
10	Galium spurium	33.25	7.47	1.81
11	Trifolium pratense	29.51	6.73	1.63
12	Euphorbia hirta	24.78	5.62	1.37
13	Trichodesma zeylanicum	23.09	4.73	1.15
14	Hypericum perforatum	22.27	3.98	0.97
15	Heliotropium zeylanicum	22.53	3.69	0.90
16	Eriochloa villosa	21.57	3.67	0.89
17	Lolium temulentum	21.40	3.65	0.89
18	Aphanes arvensis	20.88	3.84	0.93
19	Rumex obtusitolium	20.88	3.61	0.88
20	Anthemis tigreensis A.Rich	17.97	2.00	0.49
21	Argemone spp	17.97	3.82	0.93
22	Avena fatua L.	16.80	1.79	0.43
23	Snowdenia polystachya	12.63	1.26	0.31
24	Pennisetum polystachion	13.85	1.28	0.31
25	Andropogon abyssincus	13.85	1.30	0.32
26	Guizotia scabra	14.37	1.35	0.33
27	Euphorbia schimperiana	14.84	1.36	0.33
28	Commelina diffusa	10.20	1.00	0.24
29	Rumex abyssinicus	7.42	0.91	0.22
30	Brachiaria eruciformis	4.82	0.25	0.06
31	Digitaria abyssinica	8.59	0.48	0.12
32	Trifolium rueppellianum	11.33	1.01	0.25
33	Chamaemelum nobile	5.16	0.18	0.04
34	Anagallis arvensis	4.21	0.17	0.04
35	Solanum nigrum	10.46	1.03	0.25
36	Digitaria ternata	17.84	2.05	0.50
37	Crassocephalum rubens	7.86	0.43	0.10
38	Chenopodium fasciculosum	5.16	0.20	0.05
39	Chenopodium procerum (Hachst ex.)	17.23	2.02	0.49
40	Spilathes mauritiana (Rich.ex Pers.) D.C.	0.91	0.07	0.02
41	Commelina subulata Rott	3.08	0.18	0.04
42	Cyanotis barbarta D. Don	1.69	0.07	0.02
43	Ocimum spp.	2.21	0.09	0.02
44	Mariscus sieberianus	1.78	0.08	0.02
45	Cyperus assimilis	7.68	0.92	0.22
46	Cyperus rotundus L.	14.80	1.36	0.33
47	Amaranthus spinosus	0.82	0.04	0.01
48	Amaranthus graecizans L.	8.98	0.50	0.12
49	Amaranthus hybridus L.	1.35	0.07	0.02
50	Medicago polymorpha	3.82	0.18	0.04
51	Cyperus esculentus	0.91	0.07	0.02
52	Caylusea abyssinica	0.56	0.03	0.01

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53	Bromus pectinatus Thumb 0.50	17.06	2.04	
54	Cynodon nlemfuensis 0.05	3.95	0.19	
55	Phalais minor	13.98	1.27	0.31
56	Phalaris paradoxa L. 0.48	16.45	1.98	
57	Setaria verticillata (L.) 0.22	7.25	0.91	
58	Erucastrum arabicum 0.12	9.20	0.49	
59	Xanthium strumarium 0.21	6.47	0.85	
60	Anthriscus sylvestris 0.23	9.59	0.95	
61	Sonchus arvensis	9.07	0.50	0.12
62	Lactuca seriola	3.88	0.19	0.05
63	Pteridium aquilinum 0.05	4.17	0.20	
64	Achyranthes aspera	4.90	0.22	0.05
65	Convolvulus spp	0.48	0.02	0.01
66	Cynoglossum lancelatum 0.02	1.78	0.08	
67	Gnaphalium unionis 0.02	2.13	0.09	
68	Sochus oleraceus	1.13	0.07	0.02
69	Ipomea ochracea	5.16	0.23	0.06
70	Echinocloa colona	0.48	0.02	0.01
71	Ageratum conyzoides 0.00	0.26	0.01	
72	Trifolium spp	4.12	0.21	0.05
73	Leucas martinicensis 0.04	4.56	0.18	
74	Datura stramonium	5.34	0.22	0.05
75	Bidens pachyloma	3.21	0.17	0.04
76	Eleusine indica	7.25	0.90	0.22
77	Hibiscus trionum	2.21	0.10	0.02
78	Oxalis latifolia	0.07	0.00	0.00
79	Scorpiurus muricatus 0.04	2.73	0.17	
80				
81	Plantago major	4.38	0.21	0.05
	Sonchus asper	1.26	0.08	0.02
82	Digitaria velutina	1.35	0.09	0.02
83	Tagetes minuta	0.09	0.00	0.00
84	Eriocloa fatmensis	0.09	0.00	0.00
85	Setaria pumila	0.30	0.00	0.00
86	Arabidopsis thaliana 0.00	0.07	0.00	
87	Corrigiola capensis	2.00	0.02	0.00
88	Celosia trigyna	0.52	0.01	0.00
89	Nicandra physalodes 0.00	0.07	0.00	
90	Malva neglecta.	0.17	0.00	0.00
91	Convolvulus arvensis 0.00	0.82	0.01	
92	Bidens pilosa	0.04	0.00	0.00
93	Raphanus raphanistrun 0.00	0.04	0.00	

Major Weeds Affecting Wheat Production

It is quite necessary to have the list of major weeds in a locality in order to plan a long-term weed research and/or management strategy for the economic crops (Hashim and Marwat, 2002). Major broadleaved and grass weeds species that were found infested wheat fields of Chelia and Mida Kegn districts are *Polygonum nepalense, Pennisetum clandestinum, Cynodon dactylon, Plantago lanceolata, Hygrophilla auriculata, Galinsoga parviflora, Veronica filiformis, Cyperus rotundus, Spergula arvensis, Galium spurium, Trifolium pretense,* and *Euphorbia hirta.* Moreover, *Avena abyssinica, Snowdenia polystachea, Setaria verticillata, Bromus pectinatus,* and *Phalaris minor*were spreading at an alarming rate in wheat fields and also can be problematic weeds in the near future.

Similarity Index

Similarity index (Community index) is an index of the extent to which species compositions existing in any two different crops or locations are similar. The weed flora similarity index of Chelia and Mida Kegn districts was 77% which means that similar weed management method can be used to control weeds at the two districts having common types of weed composition at large extent.

Farmers' Perception

In order to elicit the perception of famers towards weeds and weed infestation in wheat, informal and formal interviews were conducted. Data and information about perceptions of farmers on weed and its management were collected using formal interviews.

Education Levels and Age Categories of Respondent Farmers

The land holding of farmers of the study area varies from one to the other even within a given peasant association. The family members whose age range between 15 to 65 years are major source of farm labour. Majority of the respondents (64%) are literate who able to read and write.

Crop Production

The major crops grown in Chelia and Mida Kegn districts were wheat, tef, maize, sorghum, barley, faba bean, field pea, linseed, rapeseed, mustard, and vegetables. Among them wheat is the major crop in the area, covering 43%. The estimated average wheat yield for both districts was 3200kg per hectare. Out of the respondent the farmers who involved on cultivation of the crop during the survey year were 190 in number (87%).

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Land Preparation and Agronomic Weed management

In the study area, seedbed preparation for wheat planting begins normally with the onset of rain mostly in early April 'Arfasa' and continues up to the end of June depending on moisture condition. Most of the farmers agreed that proper seedbed preparation can significantly reduce weed infestation. In general, cereals require finer seedbed preparation than pulses and oil crops, hence more plowing frequency was practiced before wheat sowing. Sowing wheat seed contaminated with weed seeds was one of the most common reasons to introduce weeds into new fields. As to most of the respondents, sowing wheat earlier results in lower yield because of crown and root rot infection, and late seeding reduces tillering and weed suppressing ability that intern reduces yield. Most of the farmers (88%) said that the appropriate seeding rate is 100kg per a hectare and less seed rate result in high weed infestation. Seeding rates need to be increased when high weed infestation is expected or seeding is delayed beyond the optimum dates to compensate for reduced tillering.

A good fertilizer schedule based on soil tests and appropriate application timing increases the vigor and competitiveness of the wheat crop. But perception of the farmers on quantity and type of fertilizer applied per a hectare of farm land was different. Personal preference and economic considerations such as the market price of the crop produce also influence the farmers' choices. However, most of the farmers prefer growing cereals after pulses. The crop sequences practiced by farmers in the surveyed area differently; wheat-faba bean-tef by (40%), tef-sorghum-field bean (18%), maize- field bean-barley (20%), and faba bean -wheat- tef (16%).

Major Wheat production constraints

Farmers raised many crop production problems in their fields. Those were the ever increasing weed problem, unavailability of improved seed, high cost of inputs, diseases, erratic rain fall that lead to late sowing and others (Table 3). Weed problem was the foremost menace for wheat cultivation in the study area as to the respondents.

Table-3.Wheat production constraints in Chelia and Mida Kegn districts during 2012

No.	Production constraints	Number of respondents (%)
1	Diseases	43
2	Weeds	34
3	Late sowing	13
4	Low quality of seeds	3
5	Insect pests	5
6	Tree plantation	2

Farmers Estimate on Wheat Yield Losses due to Weeds

The understanding of wheat farmers at the sudy area about wheat yield losses due to weeds infestation was variable (Table 4). Worldwide, a 10 % potential yield loss in cereals is due to weeds, even at the presence of control measures (Koch and Hess, 1980).

Table 4. Farmers estimation on wheat yield losses due to weeds in Chelia and Mida Kegn districts, 2012

Respondent farmers (%)	Estimated yield loss (%)
51	13-19
29	14-29
13	30-37
7	>37

Weeds and Weed Management in Wheat Fields

Most of the farmers said that *Snowdenia polystachya, Phalaris paradoxa, Lolium temulentum, Avena abyssinica, A. fatua, Bromus pectinatus, Setaria pumila,* and *Cyperus* spp. are the most problematic weed species in order of importance and prevalence in wheat. This has also been confirmed by other studies (Taye *et al*., 1996a) according to the authors, the principal problematic grass weed species encountered in peasant farmers' wheat fields in Ethiopia are *Avena fatua*, *Bromus pectinatus*, *Lolium temulentum*, *Phalaris paradoxa*, and *Setaria pumila*. Most of the farmers (73%) assumed that free grazing after harvest also spread weed seeds. Weed species like *Lolium temulentum*, *Avena fatua*, *Rumex abyssinicus*, *Caylusea abyssinica* and *Lactuca scariola* create problems at the time of harvesting.

The importance of herbicide in cotroling in wheat weedswas well-known by most farmers and they do apply herbicides such as 2-4, D, and rarely Glyphosate and granstar in wheat fields. The most commonly used herbicide is 2, 4-D which is selective against broadleaf weed species, and the grass weeds are controlled by supplementary hand weeding. Farmers said that the success of herbicide application was dependent upon implemented farm practices, weather conditions at the time of application, herbicide rate, and type. However, most of them lack knowledge of application techniques, sprayers, and safety precautions. In the survey areas, hand weeding is practiced by 30% farmers, herbicidal weed control by 15%, and both hand weeding and herbicidal weed control above (80%).

Summary and Conclusions

Weed survey was carried out in wheat fields at Chelia and Mida Kegn Districts of West Shoa Zone, Oromiya Regional State in 2012/13 main cropping season in order to identify, quantify and prioritize weed species and assess their socio-economic impact in the area.

A diversified weed flora comprising 93 weed species belonging to 33 families was recorded in wheat fields of the two districts. Some of the broad-leaved and grass weeds most prevalent in the area were *Polygonum nepalense, Pennisetum clandestinum, Cynodon dactylon, Plantago lanceolata, Hygrophilla auriculata, Galinsoga parviflora, Veronica filiformis, Cyperus rotundus, Spergula arvensis, Galium spurium Trifolium pratense* and *Euphorbia hirta.*

The average values for frequency, abundance and dominancy of weeds in wheat were ranged from 0.04 to 97%, 0 to 95plants/$m^{2,}$ and 0 to 23%, respectively. The similarity index of the weed community in the two districts of the study area

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was 77% indicating possible use of the same weed control methods at both locations.

Therefore, list of weeds present in each field and their abundance should be considered to select the most appropriate and effective weed management options. In the study area, farmers mostly use 2, 4-D, and supplementary hand weeding to control weeds in wheat fields. They do employ weed control in August and September after the weeds have grown tall that results crop damage and reduced yield. This clearly indicates the need for awareness creation on the serious negative effect of weeds at early growth stage than later. Results of the current survey work is the first of its kind in the area, and therefore it can be used in the future to facilitate the designing of site specific weed science research and/or management that; and as a source of weed species reference database for the study area.

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References

1. Akobundu, I.O. 1991. Weeds in human affairs in sub-saharan Africa: Implications for sustainable food production. *Weed Technology* 5: 680-690.
2. Hashim, S. and K. B. Marwat. 2002. Invasive weeds a threat to the biodiversity. A case study from Abbottabad district, North West Pakistan. *Pakistan Journal Weed Science.* 8(1-2): 1-2.
3. IAR. 1985. Institute of Agricultural Research (IAR) Progress Report for 1983-1984. pp. 125-128. Department of Crop Protection.
4. IAR. 1986. Institute of Agricultural Research Progress Report for 1984-1985. pp. 105-1 II. Department of Crop Protection. APPRC (Ambo Plant Protection Research Centre).
5. Pohlan, 1. 1984. Arable farming and weed control. Institute of Tropical Agriculture, Plant Production Section, German Democratic Republic. 141 pp.
6. Taj, F. H., A. Khattak and T. Jan. 1986. Chemical weed control in wheat. *Sarhad Journal Agriculture* 2: 15-21.
7. Tamado, T. and P. Milberg. 2000. Weed flora in arable fields of eastern Ethiopia with emphasis on *Parthenium hysterophorus*. *Weed research* 40: 507-521.
8. Tanner, D. G., Giref Sahile and Workiye Tilahun. 1995. Competitive ability of Ethiopian spring bread wheat cultivars with *Avena fatua* L. *African Crop Science Journal* 3: 83-91.
9. Taye Tessema, D. G. Tanner and Mengistu Hulluka. I 996a. Grass weed competition with bread wheat in Ethiopia: I. effects on selected crop and weed vegetative parameters and yield components. *African Crop Science Journal* 4: 399-409.
10. Unger, 1. 1984. Principles and practices of weed management. Addis Ababa University, College of Agriculture, Alemaya, Ethiopia. 185 pp.

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