Studies on the weed flora associated with wheat (*Triticum aestivum* L.)
I. Density, biomass and floristic composition of associated weeds.

Sanaa A. I. Mussa
Department of Botany, Faculty of Science,
University of Cairo, Giza, Egypt.

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The present investigation is concerned with the study of the weed flora associated with wheat, *Triticum aestivum* at Qalubiya Governorate, about 25 km north east of Cairo, Egypt. The study extended from December 2000 to April 2001. Field studies were carried out at 15 days time intervals, the average density, fresh weight and dry weight of the identified weed species were estimated. The average of five quadrats (each of a square meter area) was obtained. Meanwhile, the average height of 20 individuals of wheat plants was regularly recorded. During the growing season of the crop, the prevailing temperature seemed to be appropriate for emergence of the annual winter weed seedlings such as *Sonchus oleraceus*, *Cichorium pumilum*, *Avena fatua* and others.The tremendous perennial, *Convolvulus arvensis* dominated throughout the growing season of the wheat crop. The floristic composition of the emerged seedlings was followed during the study period. The applied reduced tillage operation was carried out only once (51 days after sowing) throughout the crop growing season. This had its influence on the types of emerged species as well as on their distribution along the field.

Keywords: biomass, *Convolvulus arvensis*, floristic composition, reduced tillage.

Introduction

Wheat as a cereal crop has its distinctive and unique position among the other cereals as it represents the main food supply upon which mankind relies. Due to its significant importance, intensive ecological studies of the weed communities associated with it are of prime importance. In this respect, great attention has been paid by numerous workers (Wilson and Aebischer 1995, Kleijn 1996, Miller *et al.* 1998, Dutoit *et al.* 1999 and Jones & Maulden 1999).

The most distinguishable point in wheat cropping is that the number of tillage operations are very reduced.In the present investigation, hand weeding occurred only once during the growing season of the studied crop. Reduced tillage practice is met with other problems, and a number of shifts in weed composition are likely to be associated with reduced tillage.One shift in the tillage operations is the appearance of perennials. (Aldrich,1984) . Schwerdtle (1977) showed that reduced tillage for cereal crops in Germany led to an increase in quackgrass. In the midwest and southeast portions of the U.S.A, reduced tillage operation in corn led to an increase of the perennial honeyvine milkweed (Aldrich,1984).

The present investigation aims at studying the weed assemblage inhabiting wheat fields .The study comprises the density, biomass and the floristic composition of the investigated weeds. This reflects the most suitable conditions necessary for the seed germination of the weeds and-in turn- their abundance.

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The Study Area

In the present study, the ecology of weed assemblage associated with wheat (*Triticum aestivum* L.)was undertaken in Kashish,a small village near Shibin El-Kanater, about 25 Km N.E.Cairo, Qalubiya Governorate (Fig.1).The studied wheat field had an area of half a feddan (one feddan=4200m^2) has a certain layout (Fig.2). The soil of the studied field was of the clay type.

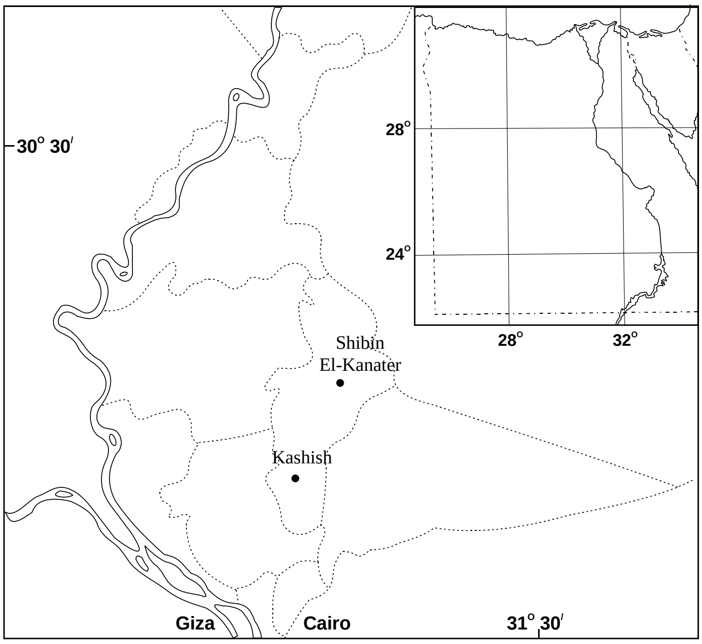

Fig. 1. Location of the study area in Qalubiya Governorate, north of Cairo.

The Layout of the studied field

A monitored picture for the layout of the studied field is presented in Fig.(2). The field consists of a longitudinally arranged series of wide basins; each of 9x19.5m. The basins are separated from each other by 25 cm elevated borders. There are other two longitudinally parallel wider borders of 50 cm width delineating all the basins from the right and left sides. These wide borders; especially the left one is broken only at the irrigation time.

Materials and Methods

The present investigation represents ecological and biological field studies of the weed assemblage growing naturally among a wheat field. Wheat grains were sown on December 5, 2000 in a previously irrigated field. This was followed by mechanical ploughing of the field. During the growing season that extended for 146 days, nine consequent visits were carried out for the chosen field. At each visit, density and biomass for each of the identified weeds were estimated as follows:

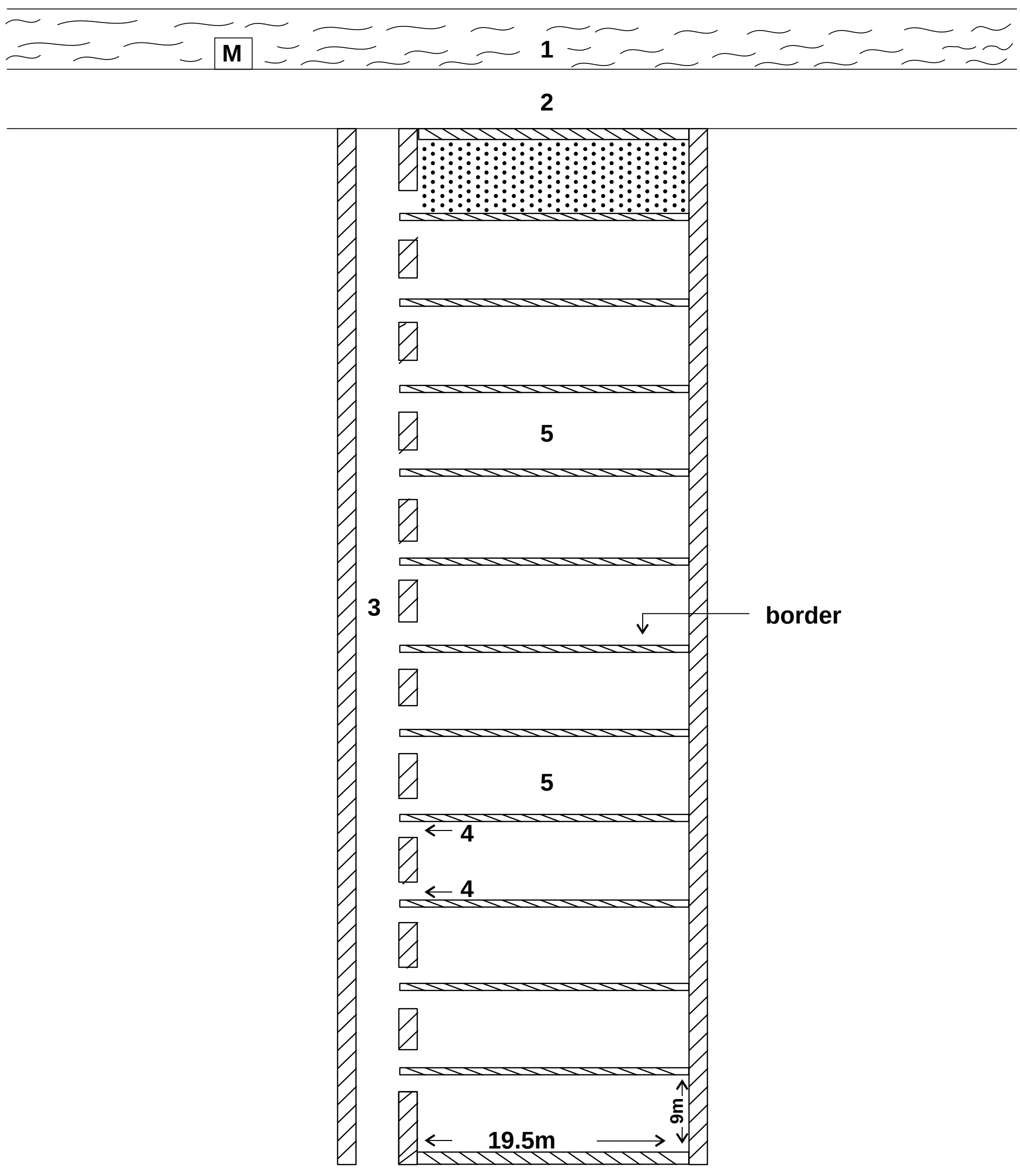

Fig. 2. A sckech map for the study area in a wheat field in the study area, Qalubiya Governorate showing the large irrigation canal, the minor canal and the basins. 1: large irrigation canal, 2: narrow road, 3: minor canal, 4: holes for water entrance, 5: the basins sown with wheat grains, M: irrigation pumping machine.

A quadrat of one square meter area was delineated using a four-cornered plastic rope. The quadrat surface soil was hoed to a depth of 2 cm using a sharp blunt- edged knife.The growing weed species were identified, the total number of individuals for each species was counted and the density was estimated. The average fresh weight per square meter for each species was determined. The plant materials were oven dried at 80°C till constant dry weight . Wheat field was irrigated five times during the growing season. Hand weeding was carried out only once (51days after cultivation). The height of wheat plants (average of 20 individuals) was regularly recorded at the different visits.

The periodic variation of the floristic composition of weeds growing within the crop was followed throughout the growing season. The different phenological aspects of the identified weeds were recorded. All the data concerning the density, fresh and dry weight estimations were subjected to the statistical analysis using the SPSS Win. Ver.8 computer programme.

Results

1. Density and Growth Criteria of The Studied Common Species

During the Different field visits, the average number of individuals per square meter (density) was estimated for each weed species. Both fresh and dry weights (g/m^2) were also evaluated. The data are presented in Tables (1) & (2) and illustrated in Fig.(3) The data reveals that *Convolvulus arvensis* is the most dominant weed species, (100% occurance). It had a climbing trend; as it rises up and twists around the wheat culms seeking for light .The number of emerged *Convolvulus* individuals showed a rapid increase from a value averaging 5.4/m^2 by the end of December to an average value of 27.2/ m^2; 38 days later . The latter value represents the maximum density reached by the species throughout the wheat growing season. This was followed by a stepwise decrease in numbers to give the values of 11.6, 10.4, 9.0 and 6.6/m^2 ; 52,66,87and 101 days after sowing respectively. During the wheat cultivation, the applied reduced tillage (once during the crop growing season) was followed by the farmers in order to avoid the crop destruction since the grains were densely sown along the basins of the field. Therefore, *Convolvulus* plants were widely distributed along the field. A further increase in the density value of *Convolvulus* was recorded by the end of March to attain a nearly doubled value of 12.4/m^2 .It is noteworthy to mention that the latter density value was accompanied with the maximum height of wheat plants and its maximum shade in turn. Further decrease was then recorded giving the values of 8.6&9.2/m^2 respectively at 129 & 143 days after cultivation. This might be due to the mortality of some weed seedlings of root fragments. The F- test revealed a significant difference among the density values at the 0.05 level during the different field visits

Both fresh and dry weights of *Convolvulus* plants nearly followed a simultaneous trend and gained their peaks of 46.3&9.2 g/m^2 respectively; 38days after the beginning. This evinces the maximum allocation of resources to the vegetative growth at this time.There is a significant difference only among the dry weight values during the wheat cultivation season.

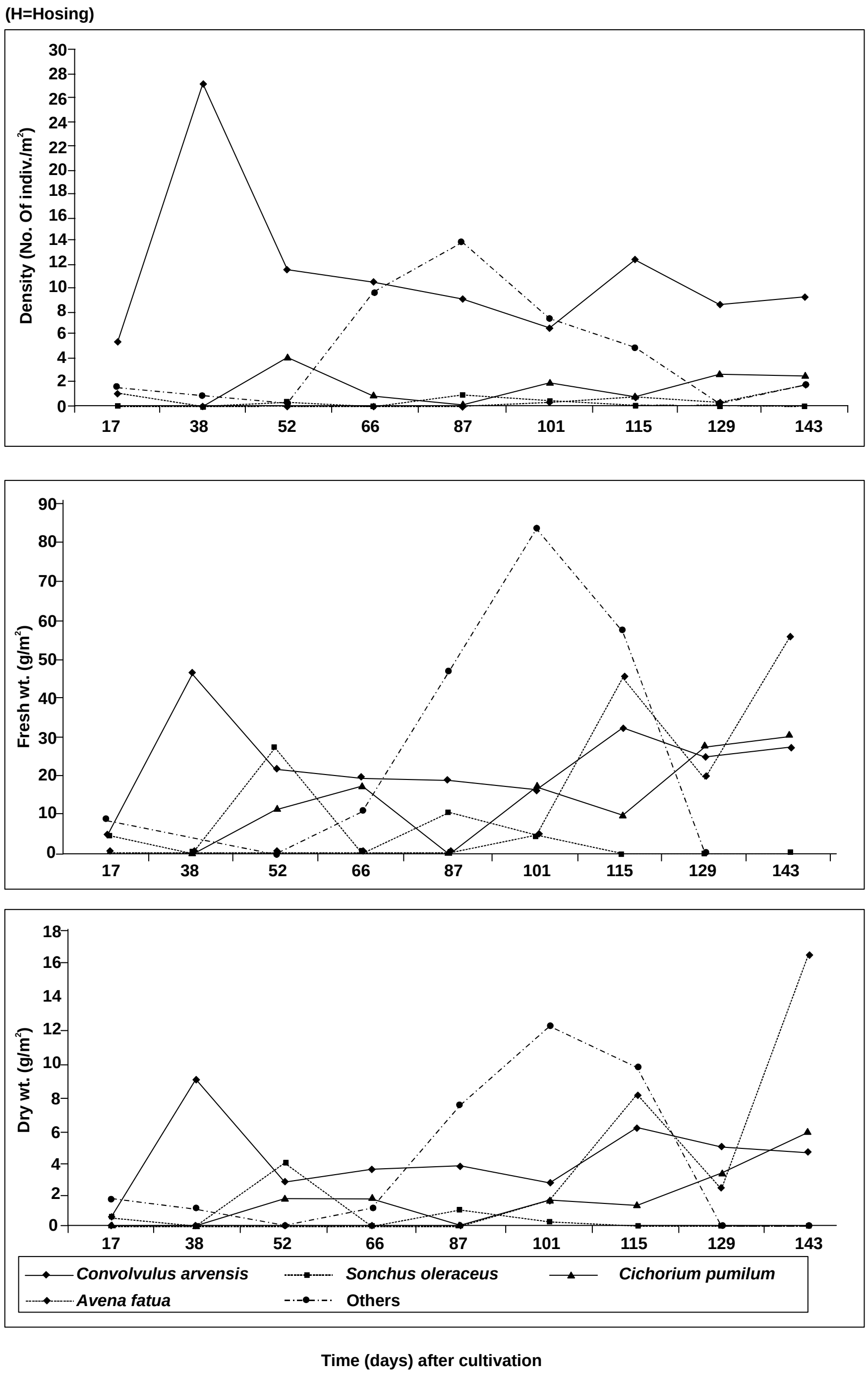

Fig. 3. Densities, fresh weight and dry weight of the different species growing in a *Triticum aestivum* field during the growing season.

Table 1. Average density, fresh weight and dry weight of the common weed species inhabiting a wheat field during its growing season. (sowing date: Dec.5.2000)

Character	Species	Time (days after sowing)									F-test	
		T1 Dec.22	T2 Jan.12	T3 Jan.26	T4 Feb.9	T5 Mar.2	T6 Mar.16	T7 Mar.30	T8 Apr.13	T9 Apr.27	Value	Sig.
1-Density (no.of indiv./m^2)	*1-Convolvulus arvensis*	5.4±5.8	27.2±10.4	11.6± 8.4	10.4±7.3	9.0±5.7	6.6±4.3	12.4±9.1	8.6±2.1	9.2±3.1	4.47	0.0008
	2- Cichorium pumilum	0	0	4.2±4.1	1.0±2.2	0	2.0±4.5	0.8±1.8	2.8±5.7	2.6±3.2	1.14	0.3608
	3-Sonchus oleraceus	1.2±2.2	0	0.4±0.9	0	1.0±1..4	0.6±1.3	0	0	0	1.10	0.3846
	4- Avena fatua	0	0	0	0	0	0.4±0.9	0.8±1.3	0.4±0.9	1.8±1.8	2.52	0.0273
	5- Others	1.6±2.1	1.0±1.7	0.4±0.5	9.6±18.1	13.8±19.3	7.4±6.6	5.0±5.9	0	0	1.42	0.2220
	Total	1.6±3.3	5.6±11.8	3.3±5.9	4.2±9.4	4.8±10.1	3.4±4.9	3.8±6.6	2.4±4.2	2.7±3.9	0.72	0.6746
2-Fresh weight (g/m^2)	*1-Convolvulus arvensis*	5.6±5.3	46.3±31.9	22.3±19.5	19.2±8.5	18.7±13.5	10.1±2.8	32.3±14.0	25.0±7.9	27.5±7.7	2.89	0.0133
	2- Cichorium pumilum	0	0	11.5±8.6	17.4±38.9	0	17.2±38.5	10.0±22.4	27.4±38.7	29.9±34.7	0.94	0.4961
	3-Sonchus oleraceus	3.8±6.9	0	27.4±61.3	0	10.6±23.1	4.6±10.3	0	0	0	0.84	0.5777
	4- Avena fatua	0	0	0	0	0	3.6±8.1	45.0±89.9	19.2±42.9	55.4±50.7	1.69	0.1330
	5- Others	8.3±11.8	3.7±5.4	0.3±0.4	10.7±21.9	46.8±66.5	83.5±41.8	57.5±110.9	0	0	2.28	0.0440
	Total	3.5±6.9	10.0±22.8	12.3±28.8	9.5±20.4	15.2±34.2	25.0±38.6	28.9±63.1	14.3±26.8	22.6±33.1	1.49	0.1636
3-Dry weight (g/m^2)	*1-Convolvulus arvensis*	0.8±0.7	9.2±5.9	2.8±1.9	3.6±1.8	3.8±2.9	2.8±0.6	6.2±3.3	5.1±1.7	4.7±1.5	3.82	0.0024
	2- Cichorium pumilum	0	0	1.8±2.1	1.9±4.2	0	4.0±1.3	2.9±3.3	3.3±4.9	6.3±1.8	1.47	0.2039
	3-Sonchus oleraceus	0.5±0.9	0	3.9±8.8	0	0.9±2.1	0.3±0.7	0	0	0	0.89	0.5349
	4- Avena fatua	0	0	0	0	0	1.5±8.1	8.1±15.1	2.4±5.4	16.4±15.5	2.81	0.0159
	5- Others	0 1.7±2.4	1.1±2.3	0.1±0.1	1.2±2.4	7.6±10.4	12.2±8.9	9.8±18.7	0	0	1.86	0.0971
	Tolal	0.6±1.3	2.1±4.5	1.7±4.1	1.3±2.5	2.4±5.4	3.7±6.1	10.7±2.2	0.1±3.7	5.4±9.2	1.91	0.0502
Average height of wheat plants (cm)		7.5	15	30.1	56.5	82	133.3	150	150	150		

Table 2. Average density (no.of indiv./m^2), fresh weight (g/m^2) and dry weight (g/m^2) of the common weed species associated with wheat during its growing season

Time (days after cultivation)	Character	Species					F-test		Av.height of Wheat plants (cm)
		Convolvulus arvensis	*Cicuorium pumilum*	*Sonchus oleraceus*	*Avena fatua*	others	Value	Sig.	
Dec.22	1-density	5.4±5.8	0	1.2±2.2	0	1.6±2.1	2.91	0.0475	7.5
(17d)	2- fr wt.	5.6±5.3	0	3.8±6.9	0	8.3±11.8	1.51	0.2368	
	3-dry wt.	0.8±0.7	0	0.5±0.9	0	1.7±2.4	1.79	0.1691	
Jan.12	1-density	27.2 ±10.4	0	0	0	1.0±1.7	32.99	0.000	15
(38d)	2- fr wt.	46.3±31.9	0	0	0	3.7±5.4	9.88	0.0001	
	3-dry wt.	9.2±5.9	0	0	0	1.1±2.3	10.07	0.0001	
Jan .26	1-density	11.6±8.4	4.2±4.2	0.4±0.9	0	0.4±0.6	6.87	0.0012	30.1
(52d)	2- fr wt.	22.3±19.5	11.5±8.6	27.4±613	0	0.3±0.4	0.93	0.4669	
	3-dry wt.	2.8±1.9	1.8±2.1	3.9±8.8	0	0.7±0.2	0.87	0.5016	
Feb.9	1-density	10.4 ±7.3	1.0±2.2	0	0	9.6±18.2	1.82	0.1642	56.5
(66d)	2- fr wt.	19.2±8.6	17.4±38.9	0	0	10.7±21.9	1.02	0.4200	
	3-dry wt.	3.6±1.8	1.9±4.2	0	0	1.2±2.4	2.16	0.1103	
Mar.2	1-density	9.0±5.7	0	1.0±1.4	0	13.8±19.3	2.45	0.0799	82
(87d)	2- fr wt.	18.8±13.5	0	10.6±23.1	0	46.8±66.5	1.81	0.1657	
	3-dry wt.	3.8±2.9	0	0.98±2.1	0	7.6±10.4	2.18	0.1079	
Mar.16	1-density	6.6±4.3	2.0±4.5	0.6±1.3	0.4±0.9	7.4±6.6	3.32	0.0305	133.3
(101d)	2- fr wt.	16.1±2.8	17.2±38.5	4.6±10.3	3.6±8.1	83.5±41.8	8.15	0.0005	
	3-dry wt.	2.8±0.6	1.8±4.0	0.3±0.7	1.6±3.5	12.2±8.9	5.36	0.0043	
Mar.30	1-density	12 .4±9.1	0.8 ±1.8	0	0.8±1.3	5.0±5.9	5.45	0.0039	150
(115d)	2- fr wt.	32.3±14.0	10.0±22.4	0	45.0±89.9	57.5±110.9	2.62	0.0658	
	3-dry wt.	6.2±3.3	1.3±2.9	0	8.1±15.1	9.9±18.7	0.77	0.5586	
Apr.13	1-density	8.6±2.1	2.8±5.7	0	0.4±0.9	0	8.95	0.0003	150
(129d)	2- fr wt.	25.0±7.9	27.4±38.7	0	19.2±42.9	0	1.32	0.2966	
	3-dry wt.	5.1±1.7	3.3±4.9	0	2.4±5.4	0	2.13	0.1150	
Apr.27	1-density	9.2 ± 3.1	2.6 ±3.2	0	1.8±1.8	0	15.53	0.000	150
(143d)	2- fr wt.	27.5±7.7	29.9±34.7	0	55.4±50.7	0	3.54	0.0243	
	3-dry wt.	4.7±1.5	5.9±6.3	0	16.4±15.5	0	4.01	0.0151	

Table 3. Floristic composition of weed species growing in a wheat field during the cultivation season.

Species	Time (days after cultivation)								
	Dec.22 (17d)	Jan 12 (38d)	Jan. 26 (52d)	Feb.9 (66d)	Mar.2 (87d)	Mar.16 (101d)	Mar.30 (115d)	Apr.13 (129d)	Apr.27 (143d)
1-Convolvulus arvensis	+ veg.	+veg.	+veg	+veg	+ fl.	+ fl.	+ fr.	+ fr.	+ fr.
2-Sonchus oleraceus	+seed1.	+veg.	+veg.	+veg.	+fl.	+ fl.	+ fr.	+ fr.	+ D
3-Bidens pilosa	+seed1.	+veg.	+veg.	+veg.	+veg	+ fl.	+ fl.	+ fr.	+ fr.
4-Cichorium pumilum	+seed1.	+veg.	+veg.	+veg.	+veg	+ fl.	+ fl.	+ fl.	+ fr.
5-Capsella bursa-pastoris	+seed1.	+veg.	+veg.	+ fl.	+ fl.	+ fr.	+ fr.	+ fr	+ D
6-Brassica nigra	+seed1.	+veg.	+veg.	+ fl.	+ fl.	+ fr.	+ fr.	+ fr	+ D
7-Euphorbia peplus	+seed1.	+veg.	+veg.	+ fl.	+ fr.	+ fr.	+ fr	+ fr	+ D
8-Euphorbia geniculata	+seed1.	+veg.	+veg.	+ fl.	+ fr.	+ fr.	+ fr	+ fr	+ D
9-Chenopodium murale	+seed1.	+veg.	+veg.	+ fl.	+ fl.	+ fr.	+ fr	+ fr	+ D
10-Stellaria pallida	-	+seed1.	+veg.	+ fl.	+ fl.	+ fr	+ fr	+ D	+ D
11-Lamium amplexicaule	-	-	+veg.	+veg.	+veg.	+ fl	+ fr	+ D	+ D
12-Melilotus indicus	-	-	+veg.	+veg.	+ fl.	+ fr.	+ fr.	+ fr	+ D
13-Rumex dentatus	-	-	+seed1.	+veg.	+veg.	+ fl.	+ fl.	+ fr	+ fr
14-Avena fatua	-	-	+veg.	+veg.	+veg.	+ fl.	+ fr.	+ fr.	+ fr
15-Poa annua	-	-	-	+veg.	+ fl.	+ fr.	+ fr.	+ fr	+ D
16-Bromus unioloides	-	-	-	-	+veg.	+ fl.	+ fr.	+ Fr.	+ Fr

+ Present, – Absent . Some species were not identified during the growing season..D: drying

Less abundant are the composite species *Cichorium pumilum* (66.6% occurrence) &*Sonchus oleraceus* (44.4% occurrence). The data (Tables 1 & 2) show that the identification of the first was difficult during the period of 51 days after the beginning of the study, while *Sonchus* was easily identified from the first field visit. Maximum density value of *Cichorium* ($4.2/m^2$) was achieved with the beginning of its identification (52days after sowing) when the *Sonchus* maximum density of $1.2/m^2$ was early obtained; 17 days after sowing. The period from the end of January to the end of April represents the flourishing period of *Cichorium pumilum* plants.On the other hand, *Sonchus oleraceus* dominated only during the period between December and March. It is interesting to mention that the environmental conditions are much appropriate to the vegetative growth of both species during their flourishing periods. It is to be noted that *Sonchus* plants stopped growing completely during the period from mid March to the end of April. No significant difference is recorded among the average density values of either species, during the wheat growing season.

Concerning the fresh weight of both species, it is obvious that a maximal value of $29.9g/m^2$ was obtaind by *Cichorium* by the end of wheat growing season while the value of 27. 4 g $/m^2$ represents the maximum for *Sonchus* and was achieved; 52 days after the start of the study . The dry weight values of the two composite species followed the same trend as that of the fresh weights. Neither fresh nor dry weight values of both species showed a significant difference throughout the wheat growing season.

It was a difficult task to identify the noxious weed, *Avena fatua* before mid March . This might be due to the great similarity in its phenological aspects with that of *Triticum,* especially during their vegetative growth periods. Its identification began as soon as it flowered(101 days after sowing). It dominated the cropfield during the period (March-April).Even though, its density was relatively low during the flourishing period. The maximum density value of $1.8/m^2$ was given by the end of wheat growing season. There is a significant difference among the mean density values throughout the crop growing season.

Both fresh and dry weights of *Avena fatua* followed a trend similar to that of its density. Two peaks were obtained; the first of which was recorded 115 days after cultivation. It gave the values of $45\&8.1g/m^2$ for both growth criteria, respectively. The other peak was achieved 143 days after sowing. It attained the values of $55.4\&16.4g/m^2$ for both characters, successively. Statistics revealed a significance among the mean density values and the mean dry weight values along the crop growing season.

During the wheat growing season, there was still a number of species that were not easy to identify and classified as others. The maximal density value for these non-identified species ($13.8/m^2$) was achieved 87 days after the beginning of investigation. This maximum was followed by a progressive decline in density values until no longer numbers of these species was recorded during the latter month of investigation. At that time (April), all the environmental factors are suitable for flowering and fruit ripening of the growing weeds. Either fresh weight or dry weight values attained their maximal values (83.5 & $12.2g/m^2$ respectively); 101 days after wheat sowing. There is only a significant difference among the mean fresh weight values of these non- identified species throughout the wheat growing season.

It is important to study the total densities and biomass of agrestal and arable weeds. The maximum total density value of $5.6/m^2$ was recorded 38 days after the start of the study. The total fresh weight showed a progressive increase with time advance and realized a maximum value of 28.9 g/m^2 115 days after cultivation. The total dry weight followed a similar behavior and gained a maximum value of 10.7 g/m^2 at the same previously-mentioned time. It is worthy to mention that the greater ability of dry matter allocation to the total weed vegetative growth is met with both maximum height and maximum shade attained by the wheat plants.There is a significant difference among the mean total dry weight values at the 5 % level of analysis throughout the wheat growing season.

It is noteworthy that most of the annual weeds were recorded in quadrats taken from the edges of wheat field. Most of these annuals tended to be broadleaf species such as *Chenopodium murale,Stellaria pallida, Sonchus oleraceus, Bidens pilosa, Capsella bursa-pastoris, Cichorium pumilum, Brassica nigra, Euphorbia geniculata,Rumex dentatus* and others. Statistical data presented in Tab.(2) reveals that there is a significant difference among the mean density values for the recorded common species along the wheat growing season , excluding the period (beginning of February to March).Data also recorded a significant difference among the mean fresh weight values for those species during the 2^{nd} , 6^{th} and 9^{th} field visits; 38,101&143 days after sowing respectively. An exact similar trend was obtained for the mean dry weight values.

II. The Floristic Composition of Weeds

The weed flora associated with crop plants in Egypt is rich that it interfere the crop plants and apparently their activities. The extent of reduction in crop yield caused by weeds varies greatly depending upon the crop, the weed and the growing conditions. Wheat-as a winter crop- has its specific weed flora (assemblage) that comprises both annual and perennial species.The floristic composition of the emerged weeds growing in the studied wheat field as well as their phenological aspects(that varied from the seedling, vegetative, flowering, fruiting and drying stages) were monitored throughout the crop growing season that extended from December, 2000 to April, 2001.Data are shown in Tab. (3). Examination of the data reveals that the weed assemblage comprises 16 species. The majority of them are winter annuals, others are perennials. Among the winter annuals are : *Sonchus oleraceus, Bidens pilosa* and *Cichorium pumilum.*Two crucifer winter annuals flourished during the crop cultivation season, viz. *Capsella bursa- pastoris & Brassica nigra.* Also, two Euphorbiaceous species namely; *Euphorbia peplus & E.geniculata* exhibited in the crop field. *Euphorbia geniculata* behaves as a summer weed and sometimes a biennial winter annual, always flourishing under relatively cold conditions. Other annual weeds belonging to other families include *Chenopodium murale* (Chenopodiaceae), *Stellaria pallida* (Caryophyllaceae), *Lamium amplexicaule* (Labiatae), *Melilotus indicus* (Leguminosae) and *Rumex dentatus* (Polygonaceae); which were monitored during the wheat growing season. Three recorded graminaceous weeds are:

Avena fatua, Bromus unioloides and *Poa annua*. The troublesome weed; *Convolvulus arvensis* was the only watched perennial during the wheat cultivation season .The identification of the latter species as well as others such as *Stellaria palida, Lamium amplexicaule, Melilotus indicus* and *Rumex dentatus* was difficult, at least during the first month after sowing. The rest of the species was easily identified during the first field visit. By the beginning of February, it was possible to identify several species such as: *Capsella bursa-pastoris, Brassica nigra, Euphorbia peplus, E.geniculata, Chenopodium murale& Stellaria pallidia.* Other species began flowering early in March. These are :*Convolvulus arvensis, Sonchus oleraceous, Melilotus indicus & Poa annua.* Flowering of *Bidens pilosa& Cichorium pumilum* as well as *Lamium amplexicaule* was delayed to mid March. During the period March-April, nearly all the species were fruiting but ripening of their fruits, shedding of seeds and complete dryness of the plants took place by the end of April; one week after crop harvest.

Discussion

The present investigation aims at studying the weed assemblage associated with wheat cropfield throughout its growing season, especially from the biological point of view (Table 1). The tillage practice was undertaken only once throughout the wheat cultivation season. It is to be noted that during the preparation of the field for wheat cultivation, it was mechanically tiled just prior to the grain sowing.

One of the pronounced results for applying reduced tillage (Tab.1)is the dominance of *Convolvulus arvensis*; as a perennial throughout the crop growing season. The species is one of the ten world's worst weeds that exist in 44 countries and is a weed of 32 different crops(Holm *et al.*,1977).It's high spreading capacity is encouraged by its vigorous vegetative propagation capacity. It's root system covers an area of six metres in diameter and extends to a depth of nine metres (Holm *et al.*, 1977).Due to the prevailence of this troublesome weed, efforts for dealing with perennial weeds must increase in the comming years (Aldrich, 1984). The dominance of C*onvolvulus arvensis* (Tab.1) might be attributed to its competitive ability (Schwerdtle, 1977). Spies & Franklin (1989) and Fangliang &Duncan (2000) report that the interspecific competition should result in higher survival of certain species and this ensures the importance of density-dependent effects in regulating plant populations. Schwerdtle (1977) shows that reduced tillage for cereal crop production in Germany led to an increase in quack grass(*Agropyron repens*).Aldrich (1984)also reports that reduced tillage in corn in the midwest and southeast portions of U.S.A. led to an increase in honeyvine milk weed *(Asclepias syriaca).* The dominance of *Convolvulus arvensis* affects the densities of other less common species. This is in agreement with Paine (1969) and Dayton (1971).They state that the structure and organization of terrestial plant communities can be influenced by one or a few functionally dominant species which may regulate, according to their competitive ability, the performance of the neighbours.

Another result of applying reduced tillage practice is the appearance of a group of winter weeds of less occurrence, viz *Cichorium pumilum* and *Sonchus oleraceus.* Following the principle of survival set by Harper(1977) and Radosevich & Holt (1984), seeds of the latter weeds germinate best at or very near to the soil surface where they find the "safe sites" since tillage distributes them throughout the soil profile. Thus, reduced tillage provides them an opportunity to gain in numbers over the species that germinate from greater depth, such as wild oat; *Avena fatua* and many others.

The results (Tab.1) indicate that the density of associated weed species showed a flactuated trend; once by increasing and another by decreasing during the wheat growing season. Aldrich (1984) states that although there is a fixed upper limit for any given weed, wide fluctuations are common both above and below the limit before the population settles back to this level. He adds that such fluctuations may be attributed to the cultural practices followed in agriculture such as the common plowing and tillage practices.

Results (Tab.1) provide that sometimes the weed weights increase as their densities decrease.So, the numbers of weeds are a relatively poor measure for competition but weed weight is a better measure since it more correctly measures the quantities of growth factors cuptured by the weed and thus unavailable to the crop (Aldrich, 1984). The author also mentions that relatively small weights of weed can reduce crop yeilds. In present study, some annual weeds such as *Cichorium pumilum* dominated the cropfield during the cold and relatively warmer days. Therefore, the extent to which plants compete for environmental resources influence their abundance, biomass and fitness (Harper,1977). On the other hand *Sonchus oleraceus* could not persist during the wormer days(March – April). Meanwhile , the maximum shade was achieved by the wheat plants . As mentioned by Aldrich (1984),competition for light by a crop may have a pronounced inhibiting effect on a weed as most weeds especially annuals are very intolerant of shade. Increasing the mean total densityand biomass of the weeds reflects the competitive ability of the weeds on crop yeild that – in turn – is influenced by the environmental conditions, including weather and soil conditions and management practices, such as fertilization level, plant spacing, crop rotation,..etc (Heemst, 1985) .The delay of identification of *Avena fatua* to mid March; its flowering time (Fig 3), ensures the assumption of Sagar& Mortimer (1976). They assume that for *Avena fatua* only 40 seeds for each 1000 produced in cereal grain actually reached the soil and the remainder were in the straw or in harvested grain.

The floristic composition of the studied field clearifies that wheat has its particular suite of associated weeds(Holzner,1982).Results (Tab. 3) indicate that there is a number of other winter weeds of less occurrence that flourished the cropfield; especially nearer to its edges, viz *Bidens pilosa, Capella bursa-pastoris, Brassica nigra, Euphorbia peplus,E.geniculata,Chenopoium murale, Stellaria palida,Lamium amplexicaule, Melilotus indicus& Rumex dentatus.* Those above-mentioned species tend to be broadleaf species.Most of them are early germinating species and have germinated by the time the crop is planted, thus giving them a competitive edge over the later germinators (Aldrich 1984, Wilson & Aebischer 1995, Kleijn 1996 and Dutoit *et al* . 1999),The weed flora of the studied field comprises other two graminaceous annuals; namely *Poa annua& Bromus unioloides.* The results (Table 3) show that most of the above-mentioned species, viz.*Capsella bursa- pastoris, Brassica nigra, Euphorbia peplus, E.geniculata, Chenopodium murale and Stellaria pallida* flower under relatively cold conditions (the end of February). Meanwhile, flowering is later for the rest of the species (e.g.*Convolvulus arvensis, Sonchus oleraceus, Cichorium pumilum, Lamium amplexicaule, Melilotus indicus, Rumex dentatus, Avena fatua, Poa annua &Bromus unioloides)* to March when conditions are more appropriate.

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