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EFFECT OF CLODINAFOP-PROPARGYL (=TOPIK 15 % WP) HERBICIDE ON WILD OAT (*AVENA FATUA* L.) CONTROL IN CULTIVATED BARLEY (*HORDUM VULGARE* L.) FIELDS UNDER RAINFED CONDITIONS

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Wild oat (*Avena fatua* L.) is a major weed in cultivated barley (*Hordum vulgare* L.) in the northwestern coastal zone of Egypt, according to survey of weeds in 2001/2002 winter season. Two field experiments were conducted at El-Negala, at northwestern coast of Egypt, during 2002/2003 and 2003/2004. They were designed in a split plot with four replication. Main plots consisted of the three doses (35, 70g / fed., and control) and sub-plots allocated with two NPK fertilizer treatments (fertilizer and un-fertilizer).

The aim of this study is to reduce the effect of wild oat (*Avena fatua* L.) weed in barley crop cv. Giza 126 by application with three different dosages (35, 70 g / fed. and control) of clodinafop-propargyl. This chemical was applied after 45 days from the sowing consistently compared with the control and used fertilizer treatments (NPK compared with unfertilized) were also applied under rainfed conditions.

The obtained results show that determined weed characters and barley yield components were decreased in both seasons. Fertilized plants by NPK were significantly superior to unfertilized ones in both seasons. On the other hand, the effect of the first order interaction indicates that fertilized and treated with 70 g herbicide plants gave the highest grain yield and yield components, also, in addition, it was obtained that on wild oat (*Avena fatua* L.), it was indicated that Topik 15% WP, at the rate of 70 g / fed. or fertilization with NPK at recommended package and their interaction increased significantly of the nitrogen and protein contents (%) in barley grain and straw at the two seasons.

In general, Topik 15% WP herbicide, at the rate of 70 g / fed. (1/2 dose recommended in valley of Egypt i.e. 140 g / fed.) + Mineral fertilization with NPK applications encourages of the farmers' herbicide usage to the control of wild oat, (*Avena fatua* L.), hence, decreases of pollution and promises the grain barley yield, and increased productivity (especially for Giza 126) under the rainfed conditions.

Keywords: topik 15%WP herbicide, weed control, fertilization, wild oat (*Avena fatua* L.), barley *(Hordum vulgare* L.).

A growing demand for barley grain has resulted in increased barley production in the northwestern coastal zone of Egypt. However, in spite of available information on crop management practices, little is known about the influence of these practices on weed populations. Weeds including wild oat (*Avena fatua* L.) can be a serious constraint to crop production (Abo El-Enein and Assad, 1999).

Wild oat (*Avena fatua* L.), is recognized as one of the ten worst weeds in the world. Infestation with wild oat can cause 30-50% reduction in wheat and barley crop yield by competition (Singh and Ghosh, 1992). Furthermore, food procedures are very sensitive to contaminants, so thorough cleaning of contaminated grain lots is necessary, which increases the cost of barley production in infested areas with wild oat crops (Scursoni *et al.*, 1999). Weeds compete with crop plant for water, nutrients, light, and space resulting in yield reduction. Barley crop is mainly affected due to presence of weeds and extent of losses due to weeds depends upon the intensity of weeds. The removal of weeds manually is very expensive and time consuming. Unfortunately, the yields of barley are relatively low (Tiwari and Parihar, 1997).

Avena fatua L. is mimic barley and dominant weed in northwest coast of Egypt. The best weed control treatment for *Avena fatua* L., control was: Dopler, Topik and Puma-S. Topik 15%WP was more efficient against grasses specially *Avena fatua L.*, in wheat field at Agric. Exp. Res., Faculty of Agricultural Cairo, Univ., Giza, Egypt (Shaban *et al.*, 2002). Usage of the Topik 15%WP not only controls the weeds effectively but reduces the cost of cultivation.

Barley *(Hordum vulgare* L.) is one of the earliest crops to be domesticated and has been cultivated since the beginning of civilization. It was grown by the ancient Egyptians along the River Nile (Moore, 1958). It said that barley is considered as one of the most suitable crops that can be grown over a wide range of adverse environments, i.e. drought, low fertility, saline soil, high or low temperature, moisture stress and weed competition,

than many other grain crops. It is often regarded as a drought-resistant crop, the water required for production of a unit weight of grains, is less than other cereals (Carleton, 1916). Therefore, it grows under dry condition as the north western cost of Mediterranean region depending on water rainfall. It can be used for several purposes, but in Egypt it is mainly used for animal feeding including both grain and straw as a source of energy for monogastric animals and bread making either alone or mixed with wheat or reygrass by some people (Bedouins) who live in the dry areas in the desert. Unfortunately, the yields of barley are relatively low, in the northwest coast of Egypt and fluctuate year after year according to the amount and distribution of rainfall rate (Sultan and El-Bilassi, 1999).

Fertilizer applications under rainfed conditions are most important to maximize the yield potential under sandy-loam soil. Nitrogen and other nutrients are quite costly and lost in many ways (Singh and Singh, 1995). Grain protein concentration may respond to higher rates of fertilizer in a linear trend. The response depends on factors that affect both fertilizer supply to the plant and the accumulation of N in the grain. Fertilizer supply is affected by initial level of soil fertility or total available soil N (Nuttall *et al.*, 1971). Therefore, the aim of this investigation is to reduce wild oat (*Avena fatua* L.) in barley crop by three different dosages of the Topik herbicide and two treatments of NPK fertilizer to improve the barley productivity and mineralization of the herbicide application under the rainfed conditions at El-Negala of the northwestern coastal zone in Egypt.

MATERIALS AND METHODS

El-Nagala' s weed flora were surveyed during the 2001/2002 winter season, and it was recorded that Lavender cotton (*Achillea santolina* L.); Sammha (*Lolium rigidum* L.); Mouse barley (*Hordum murinum* L.); Onsol (*Asphodelus microcarpus* L.); Crown daisy (*Chrysanthemum coronarium* L.); Lislis (*Didesmus bipiinnatus* L.); Pastard toad flax (*Thesium humile* Vahl.) and main topic of this manuscript was wild oat (*Avena fatua* L.) was found as a dominant weed in this area. Two field experiments were conducted at El-Negala, Marsa Matrouh Governorate, in Egypt during winter of 2002/2003 and 2003/2004 successive seasons, to reduce wild oat in barley field.

The soil of experimental site was loamy sand in texture. It has low contents of available nitrogen (0.022-0.025%) and 17-25 ppm phosphorous with high content of $CaCO_3$ (20-26%). The EC of this soil type ranged between 0.23 and 0.26 mm hos/ cm. (Tables 1a and b).

TABLE (1a). Physical characteristics of soil at El-Negela in 2002/2003 and 2003/2004 seasons.

Seasons	2002/2003					2003/2004				
Depth (cm)	Sand %		Silt %	Clay %	Texture Class	Sand %		Silt %	Clay %	Texture class
	Coarse	Fine				Coarse	Fine			
0-20	39.69	37.11	21.80	1.40	Loamy sand	15.29	58.43	24.58	1.70	Loamy sand
20-40	50.85	32.70	16.22	0.23	Loamy sand	12.91	58.78	25.36	2.95	Loamy sand

TABLE (1b). Chemical soil properties at El-Negela in 2002/2003 and 2003/2004 seasons.

Characters / Depth (cm)	pH	EC (dS/m)	Soluble cations (meq/ 100g)				Soluble anions (meq/100g)		
			Ca^{++}	Mg^{++}	Na^{+}	K^{+}	HCO_3^-	Cl^-	SO_4^{--}
2002/2003 season									
0-20	8.28	0.50	1.80	0.99	1.18	1.03	1.75	2.97	0.28
20-40	8.31	0.49	1.60	1.06	1.30	0.94	1.75	2.96	0.19
2003/2004 season									
0-20	7.90	0.48	1.93	0.50	1.50	0.87	1.75	1.92	1.13
20-40	8.40	3.00	6.50	3.00	1.85	2.00	3.00	2.30	4.00

The rainfall during the first and the second growing seasons of this study reached 85.3 mm/ year and 106 mm/ year respectively.

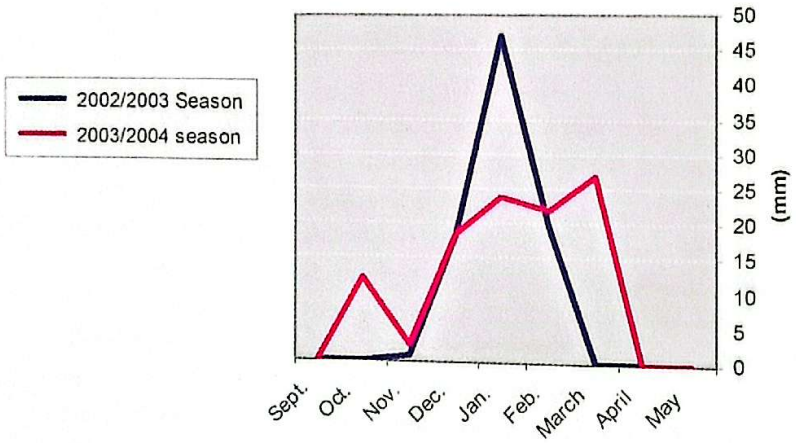

Fig (1). Monthly rainfall (mm) in El-Negala of 2002/2003 and 2003/2004 seasons.

Each experiment was designed in split-plot with four replicates. Main plots consisted of the three dosages of clodinafop-propargyl (=Topik 15% WP as 35 and 70 g / fed., and the control). Each dosage was dissolved in 200 L water / fed., and they were sprayed after the 45 days from sowing

by a hand compression-type Knapsack sprayer using flood jet nozzle. Sub-plots allocated with two treatments (fertilizer and un-fertilizer). Fertilizer application was 15.5 kg P_2O_5 as super phosphate calicium + 21 kg N as ammonium sulfate. The plots area was 180 m^2 (20 m x9 m). Grain of barley cv. Giza 126 was sown on December 1st, 2002 in the first season and December 4th, 2003 in the second season (after effective rainfall).

Characteristics Study

Observations on count and dry weight of weed were recorded at harvest time for wild oat. They are: Weed height (cm); number of *Avena fatua* L., per square meters; dry weight of weed (g/m^2). All data of *Avena fatua* L. and barley were analyzed by the analysis of variance technique.

On the other hand, at harvest time, ten guarded barley plants of four replicates were chosen to determine for: Plant height (cm); length of spike (cm); number of grain /spike; weight of grain /spike; dry weight/ plant and, 1000-grain weight (g). From square meters data recorded: number of plants/ m^2; number of spike /m^2 and weight of spike/m^2, and biological, grain and straw yields (kg /fed.). In addition, some chemical components also were analyzed such as percentage of nitrogen in grain and straw barley after harvest by Kjeldahl method (Anonymous, 1983) and grain protein content was found as multiplied by 6.25. All obtained data were subjected to analysis of variance as described by Snedecor and Cochran (1984) as a split-plot design and LSD means grouping at 5% were performed.

RESULTS AND DISCUSSION

1-Effect of Topik 15% WP Herbicide on Wild Oat (*Avena fatua* L.) in Barley Yield

1-1 Wild oat (*Avena fatua* L.) weed

Data in table (2) show that spraying Topik 15% at 35 or 70 g /fed. led to reductions in number of wild oat /m^2 and dry weight of weed /m^2 compared with un-weeded control in both seasons. Weed height was increased in each season. From the results, wild oat height was taller than the barley. It may be due to that wild oat's genotype caused elongation to conserve the species where the grains can be spraying more by the wind. These results were confirmed with Torp (1979), Sing and Ghosh (1992) and Shaban *et al.* (2002).

TABLE (2). Doses effect of Topik 15% WP herbicide on some wild oat weed (*Avena fatua* L.) agronomical traits in barley field in the first and second seasons.

Traits / Criteria	Weed height (cm)		No. of weed /m²		Dry weight *of* weed /m² (g)	
	First season	Second season	First season	Second season	First season	Second season
Control	28.83	38.15	75.13	80.38	114.00	120.20
35gTopik/fed.	31.49	48.48	35.25	38.38	62.25	65.88
70gTopik/fed	-	-	-	-	-	-
LSD at 5 %	0.3303	0.0933	1.7604	2.2311	4.3355	3.1271

1-2 Barley yield and its components

Data in table (3) show that increasing Topik 15% at 35 or 70 g /fed. led to increase barley plants significantly by the herbicide treatments in all studied traits in both seasons. These may be due to the competition between *Avena fatua* L. and cultivated barley for nutrients, water, and light. Excellent control of wild oat (*Avena fatua* L.) weed in barley field was gained with the application of 70 g / fed., which was superior to 35 g / fed. compared with un-weeded control under rainfed conditions. The application of 70 g Topik 15% / fed. gave significantly higher grain and straw yields of barley over the un-weeded control. The differences in grain yield due to weed control treatments were significant in both seasons.

TABLE (3). Doses effect of Topik 15% WP herbicide on some wild oat (Avena *fatua* L.), agronomical traits in barley cv. Giza 126.

Traits / Criteria	Plant height (cm)	Length of sipke (cm)	No. of grain /spike	Grain weight /spike(g)	Dry weight/plant (g)	1000 grain weight(g)	No. of plants/m²	No. of spike/m²	Weight of spike/m²	Biological yield (ton/fed.)	Grain yield (ton/fed)	Straw yield (ton/fed)
						2002/2003						
Control	26.74	12.58	21.50	0.72	8.84	34.25	48.25	33.75	73.25	0.79	0.45	0.34
35g Topik/fed	29.28	13.23	26.00	0.85	10.10	42.80	53.50	44.25	87.50	1.01	0.57	0.43
70g Topik/fed	32.03	14.06	31.50	1.12	11.97	46.20	59.38	54.25	106.63	1.13	0.68	0.45
LSD at 5%	0.7143	0.2684	1.0270	0.0362	0.2751	0.5395	1.7509	1.4411	4.2251	0.0306	0.0262	0.0277
						2003/2004						
Control	35.86	12.44	24.50	1.01	10.34	34.00	64.87	97.63	97.25	1.34	0.59	0.75
35g Topic/fed	45.54	14.23	28.13	1.23	11.64	49.01	76.25	120.00	119.00	1.78	0.70	1.08
70g Topic/fed	51.40	15.30	32.63	1.48	13.11	55.96	86.50	148.38	204.75	2.18	0.93	1.24
LSD at 5%	0.3864	0.3084	1.2514	0.0387	0.2644	0.3992	2.8679	2.2495	5.4106	0.0809	0.0312	0.0844

This may explain that barley crop is mainly affected by the presence of weeds and extents of losses due to the weeds depend upon the intensity of weeds. Obtained results were confirmed by Abo El-Enein and Assad (1999)

who found that plant height is an important character for crops like barley, especially, under rainfed conditions. The removal of weeds manually is very expensive and time consuming. Tiwari and parihar (1997) and Scursoni *et al.* (1999) found that the infestation with wild oat can cause a reduction in crop yield by competition. So, thorough, cleaning of contaminated grain lots is necessary, which increase the cost of barley production in areas infested with wild oat. Shaban *et al.* (2002) found that, in wheat under irrigated area, the recommended herbicide rate is 140 g Topik / fed. Therefore, under rainfed conditions save quantity of herbicide and money hence, save pollution and gave promised grain yield.

2- Effect of NP Fertilizer on Wild Oat (*Avena fatua* L.) in Barley Yield

2-1 Wild oat (*Avena fatua* L) weed

Data shows that the weeds in plots fertilized by NP were increased significantly all agronomical traits in both seasons (Table 4). This can stem from the weeds competition for nutrients, light, and water by barley. Singh (1997) found and verified that the dry weight of weeds increased significantly due to utilization of greater quantities of the applied N that result in more growth of weeds.

TABLE (4). Effect of fertilization treatments on some wild oat weed (*Avena fatua* L.) agronomical traits in barley field in the first and second seasons.

Traits and seasons / Criteria	Weed height (cm)		No. of weed /m²		Dry weight of weed L./m² (g)	
	First season	Second season	First season	Second season	First season	Second season
Unfertilized	15.36	20.76	12.25	13.92	30.71	27.62
Fertilized	24.85	36.99	61.33	65.26	93.34	89.88
LSD at 5 %	0.3555	0.2634	3.9306	1.1458	2.5697	1.0766

2-2 Barley yield and its components

Barley plants fertilized with NP were significantly superior to unfertilized plants in all agronomic traits in both seasons (Table 5). This may be due to that fertilizers encourage cell elongation and division in plant. It appears that vigorous crop growth and yield due to higher NP levels assert a strong smothering effect on growth and development of weed (Singh 1997). Increasing barley yield regarded to increase length of spike and 1000 grain weight in fertilized package treatment compared with unfertilized treatment. This data are confirmed by the findings of Singh *et al.* (1984), Singh and Singh (1995) and Singh (1997). They found that the fertilizer treatment under rainfed conditions in wheat production is most important to maximize the yield potenial under sandy-loam soil.

Higher yield level was realized in 2003/2004 than 2002/2003 for all treatments were mainly owing to more rainfall precipitation (85.3 mm) in the first season and (106 mm) in the second season (Fig 1). This may be due to that rainfall precipitation in (26.9 mm) March in 2003/2004 which increased

yield and its components than in (0 mm) in 2002/2003. Hosin and Mainruzzaman (1992) reported similar results for wheat that grain and straw yields were increased significantly due to various levels and methods of fertilizer application over the control. Identical studies were carried out by Balyan (1992).

TABLE (5). Effect of fertilization treatments on some yield components in Giza 126 barley cultivar in both seasons.

Criteria	Plant height (cm)	Length of sipke (cm)	No. of grain /spike	Grain weight /spike(g)	Dry weight/plant g) (	1000 grain weight(g)	No. of plants/m²	No.of spike/m²	Weight of spike/m²	Biological yield (ton/fed.)	Grain yield (ton/fed.)	Straw yield (ton/fed.)
2002/2003												
Unfertilized	21.49	11.36	18.92	0.61	4.90	29.55	38.34	26.83	59.25	0.74	0.34	0.40
Fertilized	37.20	15.22	33.75	1.18	15.71	52.62	69.08	61.33	119.00	1.21	0.79	0.41
LSD at 5%	0.6684	0.1394	0.9187	0.0658	0.5039	0.5268	3.5548	2.7899	4.1398	0.0478	0.0109	Ns
2003/2004												
Unfertilized	30.44	12.14	22.92	0.91	6.76	35.74	52.75	94.67	84.25	0.95	0.47	0.48
Fertilized	58.09	15.83	33.92	1.57	16.64	60.91	99.00	149.33	196.42	2.58	1.01	1.57
LSD at 5%	0.3478	0.3954	0.6125	0.0435	0.1752	0.2969	5.2575	2.6343	4.7933	0.0687	0.0189	0.0717

Ns = non-significant

3-Effect of the Interaction Between Topik 15%WP and NP Fertilizer

3-1 Wild oat (*Avena fatua* L.)

Data indicated in fig (2) shows that the interaction between Topik 15%WP herbicide and mineral fertilizer NP on wild oat (*Avena fatua* L.) was significant in all characters in both seasons. The best treatment was 70g Topik 15% WP under each fertilizers treatment.

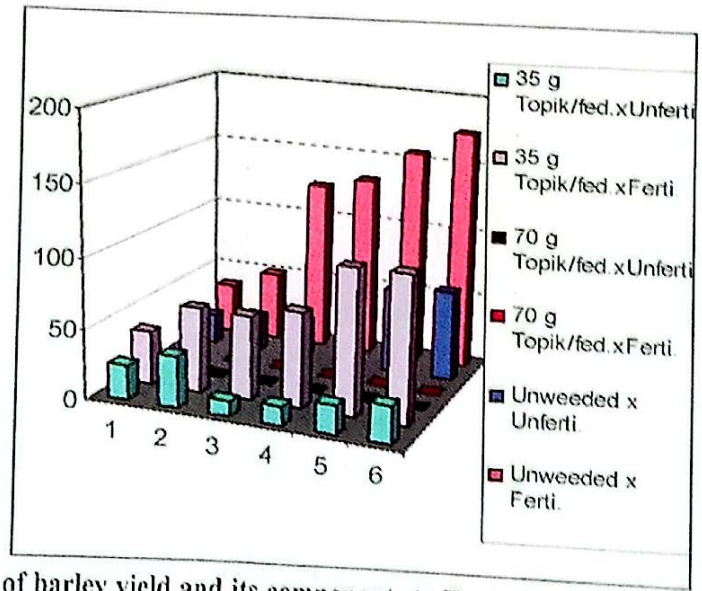

Fig. (2). Response of barley yield and its components to Topik 15WP and mineral NP fertilizers on some characters: 1-Weed height in the first season, 2- Weed height in the second season, 3-Number of weed/m² in the first season, 4- Number of weed /m² in the second season, 5- Dry weight of weed/ m² in the first season, 6- Dry weight of weed/ m² in the second season.

3-2 Barley yield and its components

Data indicated in figs (3a, b, c and d) show that the interaction between Topik 15% WP treatments and NP fertilization were significant in some characters under the study in both seasons except length of spike, dry weight / plant, number of plants / m^2 and grain yield in 2002/2003 as well as length of spike and dry weight / plant in 2003/2004. The differences in grain yield under the weed control treatments were non-significant in the first season. On the other hand, the herbicide treatments gave more grain yield than the control treatment.

In general, Topik 15% WP herbicide, at the rate of 70 g / fed. (1/2 dose which recommended of valley in Egypt, which used 140 g / fed.) + mineral fertilization with NP applications encourages of the farmers herbicide usage to the control of wild oat, (*Avena fatua* L.), hence, decrease of pollution and promise the grain barley yield and increased productivity of barley (especially for Giza 126) under rainfed conditions at El- Negala.

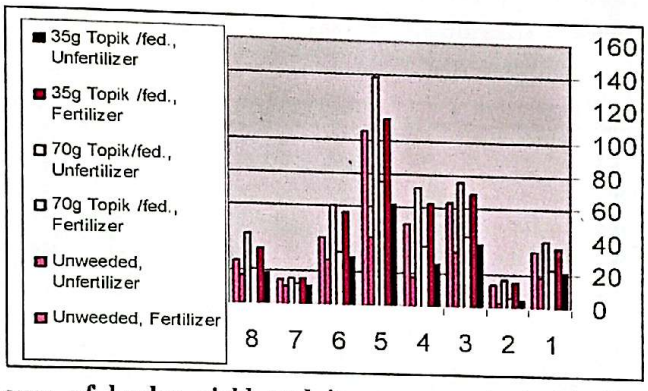

Fig. (3a). Response of barley yield and its components to Topik 15%WP and NP fertilizer for some agronomical traits in the first season: 1- plant height, 2- dry weight/ plant, 3- No. of plant/m^2, 4- No. of spikes/m^2, 5- weight of spike/m^2, 6- 1000grain weight 7- length of spike and 8- No. of grain/ spike.

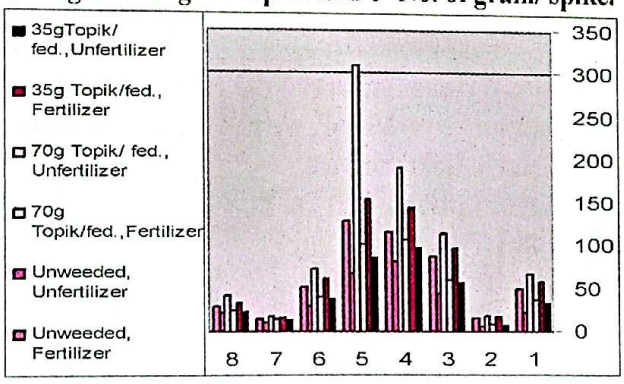

Fig. (3b). Response of barley yield and its components to Topik 15%WP and NP fertilizer for some agronomical traits in the second season : 1-plant height,2- dry weight/ plant, 3- No. of plant/m^2, 4- No. of spikes/m^2, 5-weight of spike/m^2, 6-1000grain weight, 7- length of spike and 8- No. of grain/spike.

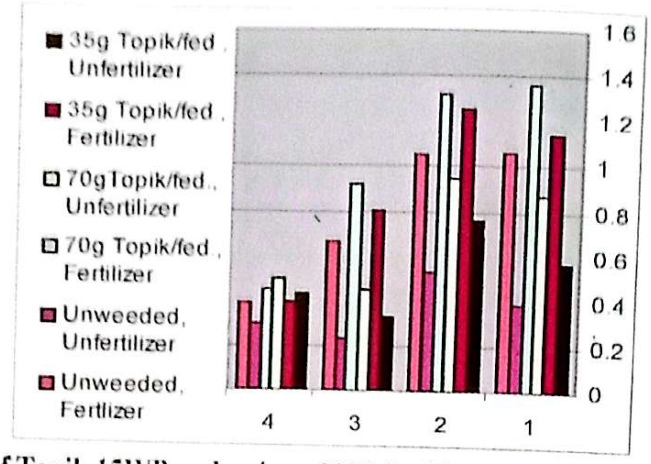

Fig. (3c). Effect of Topik 15WP and mineral NP fertilizer to some agronomical traits in the first season: 1- grain of weight /spike , 2- biological yield, 3- seed yield and 4- straw yield ton /fed.

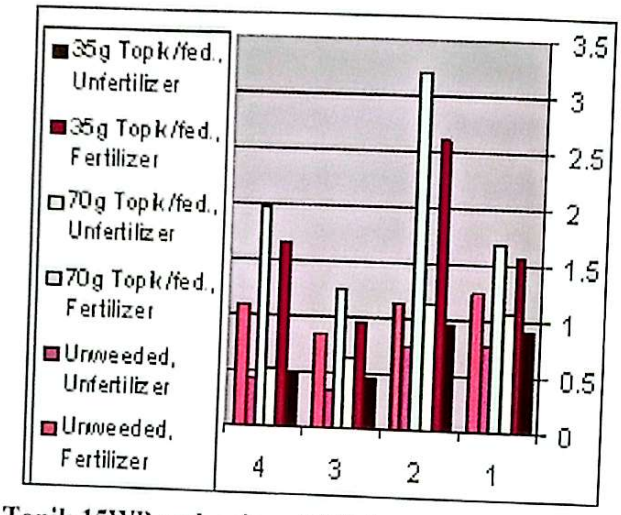

Fig. (3d). Effect of Topik 15WP and mineral NP fertilizer to some agronomical traits in the second season: 1- grain of weight /spike , 2- biological yield, 3- seed yield and 4- straw yield ton /fed.

4- Chemical Content in Barley Grain and Straw

4-1 Effect of Topik 15%WP

Data in table (6) indicated that the effect of Topik 15% WP on percentage of nitrogen and protein in barley grains and straw at harvest during 2002/2003 and 2003/2004, was increased by increasing Topik 15%WP application from 35 g to 70 g Topik 15% WP than the control treatment. Explanation of this effect may be due to environmental conditions such as low rainfall and high temperatures that often cause increase in grain protein (Weston *et al.*, 1993; Qamar *et al.*, 1999).

TABLE (6). Effect of Topik 15%WP on Nitrogen and Protein contents (%) of barley grain and straw under rainfed conditions in the first (2002/2003) and second (2003/2004) seasons.

Criteria	Barley grain				Barley straw			
	Nitrogen		Protein		Nitrogen		Protein	
Seasons	First season	Second season	First season	Second season	First season	Second season	First season	Second season
Control	1.84	1.61	11.53	10.09	1.04	0.97	6.51	6.06
35 g Topik/ fed.	2.04	1.87	12.76	11.71	1.09	1.03	6.81	6.43
70 g Topik/fed.	2.46	2.32	15.40	14.49	1.16	1.09	7.26	6.79
LSD at 5%	0.0433	0.0429	0.2713	0.2622	0.0229	0.0258	0.1519	0.1654

4-2 Effect of NP fertilizer

Data in table (7) shows that the effect of mineral NP fertilizer on percentage of nitrogen and protein in barley grain and straw in the first and second seasons was increased significantly by fertilization at the recommended package than that of the unfertilized barley. These results confirm the findings of Zubriski *et al.* (1970); Lauer and Partridge (1990); Weston *et al.*(1993) and Karadag and Buyukburc (2004) who found that fertilizers added to soil at recommended amounts increases grain protein concentration of barley.

TABLE (7). Effect of mineral fertilization on nitrogen and protein contents (%) in barley grain and straw under rainfed conditions in the first (2002/2003) and second (2003/2004) seasons.

Criteria	Barley grain				Barley straw			
	Nitrogen		Protein		Nitrogen		Protein	
Seasons	First season	Second season	First season	Second season	First season	Second season	First season	Second season
Unferti.	1.69	1.53	10.61	9.58	1.03	0.96	6.40	6.01
Fertilized	2.53	2.34	15.84	14.62	1.17	1.09	7.33	6.84
LSD at 5%	0.0477	0.0421	0.2969	0.2631	0.0275	0.0261	0.1642	0.1837

4-3 Effect of the interaction between Topik 15% WP and the mineral fertilizers

Data in figs (4 a and b) show that the interaction between Topik 15%WP and mineral fertilization (NP) on percentage of nitrogen and protein in barley grain and straw increased significantly and in-significantly by increasing Topik application rate to be 70 g/fed. during 2002/2003 and 2003/2004 seasons. However the percentage of nitrogen and protein of barley straw increased non-significantly in both seasons.

5- The Relation Between Rainfall and Yield

Data collected throughout 2002/2003 and 2003/2004 indicated that the respective values of general means were 85.3 and 106 mm for rainfall, for grain yield, 0.57 and 0.74 ton / fed., and 0.4 and 1.02 ton / fed., for straw yield. Water use efficiency of grain was 1.59 and 1.66 in the first and second

seasons, respectively. This data are in harmony with Salem (1998) who found that the correlation between yield and amount of rainfall in northwest coast of Egypt was positive.

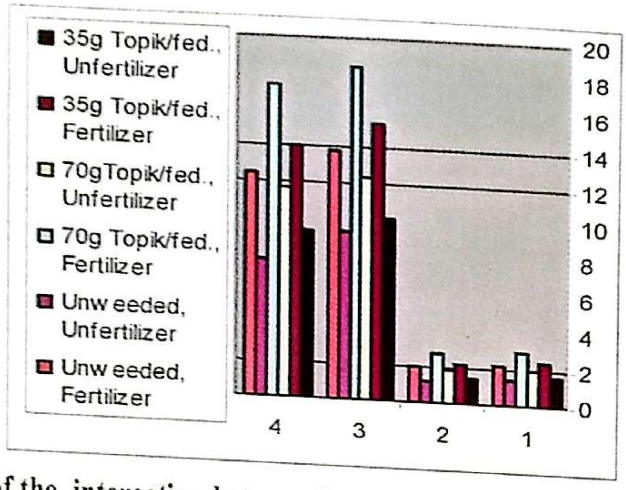

Fig (4 a). Effect of the interaction between Topik 15%WP and NP mineral fertilizer on chemical content of barley in the first season : 1- N % in grain, 2- N % in straw, 3- Protein % in grain and 4- Protein % in straw.

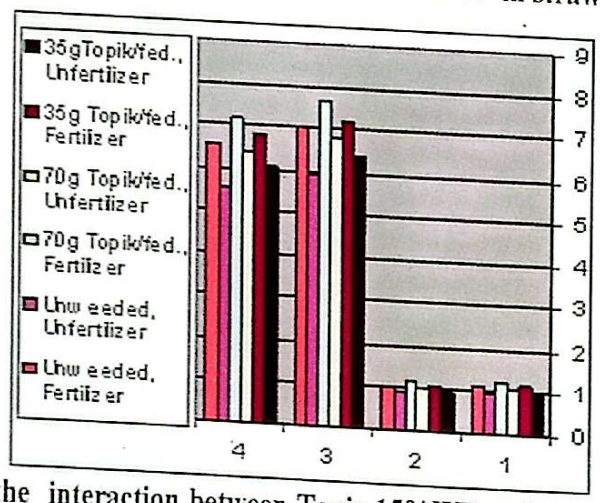

Fig. (4b) Effect of the interaction between Topic 15%WP and mineral NP fertilizer on chemical content of barley in the second season: 1- N % in grain, 2- N % in straw, 3- Protein % in grain and 4- Protein % in straw.

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تأثير مبيد الحشائش (توبيك ١٥%) على مكافحة حشيشة الزمير بحقول الشعير المنزرع تحت الظروف المطرية

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تم إجراء حصر للحشائش المنتشرة بمنطقة النجيلة بالساحل الشمالي الغربي في الموسم الزراعي الشتوي ٢٠٠١/٢٠٠٢ وقد لوحظ سيادة حشيشة الزمير بالمنطقة مقارنة ببافي أنواع الحشائش هناك لذا تم أجراء تجربتين حقليتين بمركز النجيلة (تبعد ٧٥ كم غرب مرسى مطروح) خلال الموسمين الزراعيين ٢٠٠٢/٢٠٠٣و ٢٠٠٣/٢٠٠٤ وذلك لمكافحة حشيشة الزمير في حقول الشعير صنف جيزة ١٢٦ من خلال دراسة تركيزين من مبيد الحشائش البرباجيل مسحوق قابل للبلل (توبيك ١٥%) بمعدل ٣٥و ٧٠ جم/ فدان والتي تم رشهما على النباتات بعد إذابة كل تركيز في ٢٠٠ لتر ماء وقد تم الرش بهما بعد ٤٥ يوم من الزراعة بالاضافة إلى معاملة المقارنة بدون استخدام المبيد. والمعاملة الثانية اشتملت على التسميد بمعدل ١٥,٥ وحدة فو٢٥ في صورة سوبر فوسفات الكالسيوم و ٢١ وحدة نتروجين في صورة كبريتات نشادر) مقارنة بدون تسميد وذلك لمكافحة حشيشة الزمير في حقول الشعير التي تؤدى إلى انخفاض إنتاجية الشعير بمنطقة النجيلة. وقد أوضحت النتائج المتحصل عليها ما يلي:

١- تزداد معنوية صفات محصول الشعير ومكوناته بزيادة تركيز مبيد الحشائش التوبيك ١٥% من ٣٥ حتى ٧٠ جم /فدان مما ادى الى قلة نباتات الزمير في كلا الموسمين.
٢- تفوقت النباتات المسمدة بالسماد المعدني معنويا عن النباتات غير المسمدة في صفات محصول الشعير ومكوناته في كلا الموسمين.
٣- كان التفاعل بين مبيد الحشائش التوبيك ١٥% والتسميد معنويا في بعض صفات محصول الشعير ومكوناته في كلا الموسمين حيث كانت افضل معاملة هي المعاملة بمبيد التوبيك ١٥% بمعدل ٧٠جم / فدان والمسمدة معدنيا في كلا الموسمين تحت ظروف منطقة النجيلة بالساحل الشمالي الغربي لمصر.
٤- تفوقت المعاملة الفعالة لمكافحة حشيشة الزمير(٧٠ جم توبيك ١٥% / فدان) معنويا في كلا الموسمين.
٥- تزداد حشيشة الزمير في المعاملة المسمدة بالسماد المعدني عن المعاملة بدون تسميد في كلا الموسمين.
٦- تزداد نسبة للنتروجين و نسبة للبروتين في حبوب وقش الشعير المنزرع في منطقة النجيلة تحت الظروف المطرية زيادة معنوية عند استخدام ٧٠ جم مبيد التوبيك ١٥% / فدان وأيضا عند النباتات المسمدة بالسماد المعدني وعند التفاعل بينهما في كلا الموسمين.
٧- تحت هذه الظروف بمنطقة النجيلة يوصى باستخدام مبيد الحشائش توبتك ١٥% / بتركيز ٧٠ جم/ فدان (وهى ٢/١ الجرعة المستخدمة تحت الظروف الطبيعية باراضى الوادي والدلتا بمصر حيث يستخدم بمعدل ١٤٠ جم /فدان) مع الحرص على استخدام السماد المعدني لمحصول الشعير صنف جيزة ١٢٦ وذلك لتشجيع المزارعين على مكافحة حشيشة الزمير في المناطق الموبؤة به وبالتالي الحصول على إنتاجية عالية من حبوب الشعير تحت ظروف الاراضى المطرية بالساحل الشمالي الغربي.