SHIFTING OF GRASSY WEEDS AND RESPONSE OF RICE PRODUCTIVITY DUE TO CONTINUOUSLY APPLICATION OF HERBICIDES IN BROADCAST-SEEDED RICE.

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ABSTRACT

A long-term experiment was conducted in wire house since 2002 to 2006 rice growing seasons. The objective of the study was to detect the responses of grassy weeds and rice to the continuous application of two recommended herbicides in broadcast-seeded rice. Thiobencarb, at 3.6 kg ai/ha, 10 DAP and bispyribac 0.04 kg ai/ha, 25 DAP were applied throughout 5 successive growing seasons. Weed flora complex has been considerably changed from the third season to the fifth comparing to the first season of the study. *E.crus-galli*, *E.colona* and *Digitaria spp* showed different trends in dominance throughout the fiuf seasons and different weed control treatments. *Digitaria spp* exhibited the great dominance especially with the continuous application of thiobencarb for the five seasons. Dominance of *Digitaria spp* changed from 0.23 to 11%, 0.86 to 94.6% and 1.51 to 95% from 2002 to 2006 seasons in the untreated plots, respectively.

The continuous application of thiobemcarb and bispyribac significantly reduced number of panicles/m^2 and grain yield of rice after third to fifth year as compared to the first and second year of application.

INTRODUCTION

Over a short period of time, plant communities often are perceived as being stable **(willimson, 1991)**, their composition of species appearing relatively constant from season to season and year to year. Nevertheless, evolutionary change is inevitable in all plant communities, and shifts in species composition over time and the result of human disturbance should always excepted **(Radosevich *et al*, 1996)**.

Although changes in weed species are continually taking place, the extreme efficacy of herbicides increases selective pressure to very high levels, some times producing local extensions.

(Radosevich *et al*, 1996). Many authors **(Ashton** and **Crafts, 1981; Ross** and **Lembi, 1985**; **Devine *et al*, 1993)** have reviewed numerous publications that demonstrate differential susceptibility of plant species to herbicides. Because of interspecific selectivity, continued use of a particular herbicide often causes a shift within a weed community from a susceptible to more tolerant species. For example, a species shift that favors grasses is readily observed from application of 2, 4-D for broadleaf weed control, when made annually for a number of years in cereals. The selective activity of herbicide use in crops is expected and in fact is encouraged, since it is the basis for effective weed control in crops. **Fryer and chancellor (1979)** and **Fryer (1982)** reported that, as a result of routine spraying of 2,4-D and related herbicides during the last four decades in Great Britain, many susceptible broadleaf weed species have declined in frequency, whereas grass weeds, such as wild oat (*Avena* spp.) and blackgrass (*Alopecurus myosuroides*) have increased in importance.

Another example of a shift in weed species composition from herbicide use occurs when both crop and weed species are closely related taxonomically. Plants frequently respond similarly to herbicides according to taxonomic families, probably because similar taxonomic characteristics reflect similar physiological or morphological traits that also affect herbicide performance. Trifluralin, for example, does not readily control plants in the family Solanaceae, and for that reason, it is used for weed, especially grasses, suppression in such crops. Repeated use of trifluralin in tolerant crops on an annual basis frequently causes a shift in weed species composition towards nightshades (*Solanum* spp). Observations of species shift are not restricted to a few herbicides such as 2,4-D and trifluralin, but are of rather widespread occurrence and involve many herbicides and many weed species. Other examples include the increase occurrence of pigweeds (*Amaranthus* spp.) from use of napropamide, mustards (*Brassica* SPP.) from use of binifin, and common groundsel (*Senecio valgaris*) from use of dioron and terbacil **(Radosevich *et al* 1996).**

As many weeds grow rabidly and are vigorous competitors, their reduction or elimination usually leads to much enhanced growth of the vegetation remaining after treatment with herbicides. Many studies have shown that the effects of neighboring plants on one to another is considerable, some species being very sensitive to competitive pressure which are reflected in their growth and abundance whereas other, often species of low yield, are less sensitive. These sensitivities are reflected in the new structure of the new communities arising after herbicide treatment **(Willis, 1990).**

Experimental evidence suggests that while herbicides may affect the relative abundances of species, they will seldom lead to the disappearance of a species altogether. **Thurston (1964)** found that seven year of annual application of phenoxy acid herbicides caused a decrease in abundance of sensitive species, but none were eliminated. *Polygonum aricular* decreased, but others such as *Tripleurospermum maritimum*, *Aphances arvensis* and *Euphorbia exigua* increased. **Rademacher *et al* (1970)** found that the relative abundances of different broad-leaf weeds after 12 year depended on the particular herbicide used. *Sinapis arvensis* had declined markedly in abundance under all herbicide treatments even though the species possesses dormant seeds which may survive for long periods the seed bank. Most species had declined under those herbicides to which they were susceptible.

Direct-seeded rice (*Oryza sativa* L.) cultivation is one of the most common and economic way of producing rice in the world that for saving water and labor **(Poolkumlung *et al* 2001).** Under this situation rice crop suffers from severe grassy weeds competition and continuous herbicide use should be applied **(Ampog-Nyarko** and **De Data 1991).**

The present study aimed to detect weed shifting of grasses and crop productivity due to the continuous application of thiobencarb and bispyribac herbicides for successive five years in broadcast-seeded rice.

MATERIALS AND METHODS

A long term study was carried out throughout 2002 to 2006 seasons in the screen house at Rice Research and Training Center, Sakha, Kafr El-Sheikh. The study aimed to detect the response of population dynamics of grassy weeds and crop productivity as a result of the continuous application of two herbicides in broadcast-seeded rice.

Plots with area of 6 m^2 and heavy clayey soil were hand hoed, dry leveled, flooded and wet leveled for broadcast-seeded rice. Based on previous history of weed infestation, the experimental plots were heavily infested with grassy weeds. *Echinochloa crus-galli* was the dominant followed by *Echinochloa colona* while other species were rarely pronounced.

The used statistical design was RCB with four replications. Three weed control treatments included untreated check, thiobencarb 50% at 3.6 kg ai/ha and bispyribac 2% at 0.04 kg ai/ha as recommended herbicides since more than ten years ago and used largely by farmers in broadcast-seeded rice. The treatments were randomly distributed in each replication during the first season only and fixed with the next up to the end of the study. Thiobencarb treatment was applied 9 days after sowing (DAS) while the herbicide was solved and mixed with sand and broadcasted by hand onto the flooded plots. Bispyribac was sprayed using Gloria sprayer as 5 liters capacity with a rate of water as 240 L/ha, 25 DAS on drained plots while flooding was introduced 48 h after treatment.

All fertilizer applications and other pest managements were applied as recommended in broadcast-seeded rice while irrigation was done as needed using taps designed with plots. All broadleaf and other unwanted weeds were removed by hand during growing seasons of rice.

Sampling and data recorded:

a- Weeds:

At 80 DAS, weeds were sampled by 50x50 cm quadrate replicated to times for each plot. Weeds were cleaned, classified into species and fresh weight was recorded as g/m^2 for each weed species.

b- Rice:

Before harvest, panicles were counted in two random quadrates of 50 x 50 cm and number of rice panicles/m^2 was recorded. At harvest, a guarded three m^2 were manually harvested, left for enough drought, by sunlight, threshed and grains were estimated, weighed and grain yield was recorded as kg/ plot.

All collected data were statistically analyzed by the proper analysis of variance and combined analysis was conducted for the data of five seasons to detect the changes by seasons according to Gomez and Gomez (1983). Duncan's multiple range test (DMRT) was used for comparison between means.

RESULTS AND DISCUSSION

a- Weeds:

Fresh weight (g/m^2) of *Echinochloa crus-galli, Echinochloa colona* and *Digitaria* spp. were used as reliable indicators for weed distribution during five seasons.

a-1: *Echinochloa crus-galli*:

Data presented in Table (1) and fig. (1) showed fresh weight of *E. crus-galli* as influenced by weed control treatments and the continuous application of the same treatments throughout five seasons and their interaction.

Table (1): Fresh wt. (g/m^2) of *Echinochloa crus-galli* as influenced by the continuous application of herbicides (2002-2006).

	Seasons					
Treatments	**2002**	**2003**	**2004**	**2005**	**2006**	**Mean**
Untreated	4068 b	3620 c	4560 a	3580 c	3614 c	3888.4 *A*
Thiobencarb	743 d	618 e	235 h	536 e	516 ef	529.6 *B*
Bispyribac	433 fg	365 g	125 i	253 h	248 h	284.8 *C*
Mean	1748 A	1534.3 AB	1640 B	1456.3 C	1459.3 C	

Means followed by the same letters with a same style are not significantly different at the 5% levels, according to DMRT.

Concerning weed control treatments, data cleared that the application of bispyribac recorded the greatest suppression in fresh weight of *E. crus-galli* followed by thiobencarb as compared to the untreated check plots. The final reduction in dry weight of this weed over the five seasons mean due to the application of bispyribac and thiobencrab treatments can be resulted from the high efficacy of such treatments especially bispyribac against *E.crus-gasli* by in limiting growth through the inhibition of ALS enzymes as recorded by Anonymous (1999), Hassan et al (2006).

In the respect of the repetition of the used weed control treatments in different seasons as over mean values, the first season of application recorded the highest value of *E.crus-galli* fresh weight followed by 2004 and 2003 seasons. The continuous application of the same treatments more than three seasons resulted in no significant difference in dry weight of the weed indecanting to the stability of weed community with the application of same conditions as mentioned by **Williamson(1991).**

Regarding to the effect of interaction between weed control treatments and the continuous application during five seasons on fresh weight of *E.crus-galli* it is obvious from data in table (1) and fig.(1) that both bispyribac and thiobencarb treatments significantly reduced fresh weight of *E.crus-galli* as compared to the untreated plots during the five seasons of application.

Additionally fresh weight of *E.cru-galli* showed greatly reduction in plots received bispyribac than that pronounced in plots treated by thiobencarb. Moreover, the highest value of fresh weight was recorded with the third season under the untreated check while the lowest value was observed under bispyribac treatment in the same season. Rather more, after 3 seasons, no significant changes were observed within each weed control treatment even with the untreated plots in fresh weight of *E. crus-galli*. The highly efficiency control for bispyribac treatment against *E. crus-galli* especially up to the third season of use in comparison to thiobencarb treatment may be related to the late application of the first which enabled to exhaust most germinated weeds which receved the lethal dose while the early application of thiobencarb may allowed many late germinated individuals of the weed to escape as mentioned by **Ampong-Nyarko** and **De Data (1991).**

a-2-*Echinochloa Eolona:*

Data on fresh weight of *E.colona* as influenced by weed control treatments, five seasons of the application and the interaction between the two factors is cited in table (2) and fig. (2).

Table (2): Fresh wt. (g/m^2) of *Echinochloa colona* as influenced by the continuousapplication of herbicides (2002-2006).

	Seasons					
Treatments	**2002**	**2003**	**2004**	**2005**	**2006**	**Mean**
Untreated	231 c	314 a	268 bc	281 ab	276 bc	273.4 *A*
Thiobencarb	175 d	210 c	156 d	168 d	174 d	178.4 *B*
Bispyribac	57 ef	68 e	30 f	45 ef	52 ef	50.4 *C*
Mean	154.3 C	197.3 A	151.3 C	164.7 BC	169.7 AB	

Means followed by the same letters with a same style are not significantly different at the 5% levels, according to DMRT.

For weed control treatments, the application of bispyribac or thiobencarb significantly reduced fresh weight of *E.colona* in comparson to the untreated check. Bispyribac compound showed its superiority in suppressing fresh weight of the weed than thiobencarb. The obtained results are confirmed by those found by **Hassan et al (2004)** under broadcast-seeded rice.

Concerning effects of seasons of application, it could be observed that no stable trend in fresh weight of *E.colon* from a season to another. The highest value was recorded during the seconded season of application followed by the last (2006) and 2005 seasons while no difference between 2002, 2004 and 2005 seasons.

The changed fresh weight in unstable case of *E.colona* may relate to some biological characteristics of this weed seeds in the soil. **Ramakrishna (1960).** reported that seeds of *E.colona* had a dormancy period of about two months and germinated best with exposure to continuous light.

In the respect of weed control treatments and the continuous application for five seasons interaction, data cited in table (2) and fig.(2) showed that fresh weight of *E.colona* was significantly affected the abovementioned interaction. The use of bispyeibac or thiobencarb treatments obviously reduced dry weight of *E.colona* during the five seasons of study compared to the untreated check plots. Under all seasons, bispyribac was the more suppressive than thiobencarb. The lowest weight of *E.colona* was pronounced with the third season of bispyribac application while the highest was found under the untreated plots during the second season. The superiority of bispyribac treatment in controlling *E-colona* weed during five seasons of the study may be related to the high efficiency of these treatments as ALS inhalation as mentioned by Anonymous (1999) and /or the late time of application of this treatment which allow to more flushes eradication as reported by **Ampong-Nyarko** and **De Data (1991).**

a-3: *Digitaria* spp.

Fresh weight values of *Digitaria spp* as influenced by weed control treatments, five seasons of application and their interaction are Shawn in table (3) and Fig.(3).

Table (3): Fresh wt. (g/m^2) of *Digitaria sp.* as influenced by the continuous application of herbicides (2002-2006).

	Seasons					
Treatments	**2002**	**2003**	**2004**	**2005**	**2006**	**Mean**
Untreated	10 i	251 h	420 gh	450 g	475 g	321.2 *C*
Thiobencarb	8 i	2052 e	4880 c	10890 a	10730 a	5711.6 *A*
Bispyribac	7.5 i	1320 f	2920 g	5460 b	5275 b	2996.5 *B*
Mean	8.5 D	1207 C	2740 B	5600 A	5493.3 A	

Means followed by the same letters with a same style are not significantly different at the 5% levels, according to DMRT.

The results indicated unlike trend as in the pervious two weeds, *Digitaria* spp. showed different responses to weed control treatments, thiobencarb treatments resulted in fresh weight of *Digitaria sp* significantly higher than that found in the untreated plots or with application of bisbyrebac treatment. The dominance of *Digitaria sp.* as results of the continuous herbicidal application may express the balanced status of weed community in the untreated while the treated plots by thiobencarb showed a large degree of this weed dominance than bispyribac treatments. These results may be related to the different efficacies of the used treatments against this weed species and or the time of application for each treatment as mentioned by **Hassan *et al* (2005).**

Regarding to the effect of successive five seasons of application, data in table (3) cleared dramatic increases for year after year in fresh weight of *Digitaria* sp. In the first seasons of study, only 8.5 grams/m^2 means that the population of this weed was very rare while with the successive three years, significant dominance in *Digigitaria* sp. was pronounced. After the fourth year of application, the population of *Digitaria* sp. tended to be balanced with this condition. The obtained results are in agreement with those reported by **Hassan *et al* (2004).**

In the respect of the effect of interaction between weed control treatments and five seasons of application on fresh weight of *Digitaria* spp., data presented in Tab le (3) and fig (3) showed significant difference in this trait due to this interaction. except for the first seasons, The continuous application of either thiobencarb or bispyribac treatments results in highly increased fresh weights of *Digitaria* sp. as compared to the underrated plots. The increases exceeded 8,5 and 11,6 folds for thiobencarb and bispyribac treatments during 2003 and 2004 seasons, respectively. On the other hand, *Digitaria* sp showed no differences in fresh weight after third seasons of application within treatments. The dramatic changes and significant increase in weed population by the continuous herbicidal application may related to the negative effects of such treatments on other weed species and the negative response of *Digitaria* sp to these treatments which may allowed weed population shifting as mentioned by **Devine *et al* (1993)**. Moreover, the significant reduction in fresh weight of *Digitaria* sp in plots received bispyribac than those treated by thiobencarb may related to the late emergence of this weed as mentioned by **Holm *et al* (1997)** which may enabled the weed avoid the early application of thiobencarb as mentioned by **Ampong-Narko** and **De Datte (1991)**.

a-4: total weeds:

Data in Table (4) and Fig. (4) represents the effects of weed control treatments, five seasons of application and the interaction of both factors on fresh weight of total grassy weeds.

Table (4): Fresh wt. (g/m^2) of total grassy weeds as influenced by the continuous application of herbicides (2002-2006).

	Seasons					
Treatments	**2002**	**2003**	**2004**	**2005**	**2006**	**Mean**
Untreated	4309 d	4185 d	5248 c	4311 d	4362 d	4483 *B*
Thiobencarb	926 h	2878 f	5271 c	11594 a	11420 a	6417.8 *A*
Bispyribac	497.5 i	1753 g	3075 e	5758 b	5575 bc	3331.7 *C*
Mean	1910.8 D	2938.7 C	4531.3 B	7221 A	7119 A	

Means followed by the same letters with a same style are not significantly different at the 5% levels, according to DMRT.

The results showed significant difference in fresh weight of total weeds as over mean of the five seasons of application. Thiobencarb treatment recorded the highest fresh weight of weeds followed by the untreated plots while the application of bispyribac succeeded in achieving only about 25% control. The reversed situation of the results may reflected final results after five years of continuous application of these chemical treatments which resulted in new grassy weed shifting less affected by such treatment. As reported by **Rado sivish *et al* (1996)**.

Concerning the effect of five seasons of application, data in Table (4) cleared that fresh weight of total grassy weeds significantly increased by years of application up to four years. The increases were about 1.5, 2.4 and 3.8 folds for second, third and fourth years of application as compared to the first season, respectively. However, no significant difference in fresh weight of grassy weeds was pronounced by the fourth year of application. The stability of grassy weeds population during the last two seasons of the study may reflected the final balanced population due to the interspecefic and intraspeceific interaction between species and individuals as mentioned b y **Cousens** and **Mortimer (1995)**.

For the interaction effect between weed control and seasons of application on total grassy weeds fresh weight, data in Tale (4) and Fig.(4) showed significant rcduction in fresh weight of grassy weeds due to the application of either bispyribac or thiobencarb as compared to the untreated plots during first and second seasons of application. With third season of chemical application, thiobencarb showed completely failure in controlling grassy weeds while bispyribac recorded only 41% control. After third season of application, no significant changes were pronounced within each treatment during fourth and fifth seasons of herbicidal application. These results may clearly indicated the expected failure in weed management for grassy weed control in case of the reliance on the same herbicidal treatments for more than two years for the same field due to the changes in weed communities as reported by **Fryer** and **Chancellor (1979)**.

b- Rice:

b-1: Rice panicles/m^2:

Number of panicles per unit area as affected by weed control treatments, five seasons of continuous application and their interaction are shown in Table (5) and Fig(5).

Regarding the effects of weed control treatments, the given data cleared that application of either thiobencarb or bispyribac for weed control in rice significantly increased number of panicles/m^2 as compared to the untreated plots. In addition, rice plots treated with bispyribac produced the largest number of panicles per unit area than those treated with thiobencarb. The positive performance of bispyribac in rice painless may be referred to the high efficiency of such treatment against weeds than thiobencarb.

Table (5): Panicles/m^2 as influenced by the continuous application of herbicides (2002-2006).

	Seasons					
Treatments	**2002**	**2003**	**2004**	**2005**	**2006**	**Mean**
Untreated	68 e	61 e	58 e	38 e	40 e	53 *C*
Thiobencarb	367 a	356 a	203 c	145 d	140 d	242.2 *B*
Bispyribac	385 a	372 a	285 b	210 c	221 c	294.6 *A*
Mean	273.3 A	263 A	182 B	131.0 C	133.7 C	

Means followed by the same letters with a same style are not significantly different at the 5% levels, according to DMRT.

In respect of the effect of different seasons of application, it is clear from data in Table (5) that during the first two seasons no significant change was observed in panicles per unit area. With the continuous use of the same treatments, third and fourth years exhibited significant reductions in rice panicles/m^2. After four years of application, number of panicles showed no significant change. The considerable changes in rice panicles per unit area with the third year and the stability after that time might be due to the sharp changing in weed population complex as reported by **Cousins** and **Mortimer (1995).**

Concerning the interaction between weed control treatments and seasons of application, the results shown in Table (5) and Fig.(5) cleared that number of rice panicles per square meter was greatly affected by this interactions. Rice plots treated with bispyribac or thiobencarb produced panicles significantly more than the untreated plots during five seasons of the study. Using either bispyrbac or thiobencarb for weed control significantly reduced number of panicles/m^2 after two seasons of application. Under both chemical treatments, after the fourth years of application, no more significant change was observed. Morover, bispyribac treatment significantly exceeded thiobencarb in number of panicles/m^2 with more than two years of application. The superiority of bispyribac treatment especially after two years of application may be due to the late post emergence spraying which may controled grassy weeds efficiently as reported by

Ampong-Nyarko and **De Datta** (1991). On the other hand, under the untreated plots, the stability of the recorded numbers of panicles/m^2 from year to year may be due to the stability in weed community population in these conditions.

B-2: Grain yield (kg/plot):

Mean values of grain yield (kg/plot) as influenced by weed control treatments, five seasons of application and third interaction are cited in Table (6) and Fig.(6).

Table (6): Grain yield kg/plot (3m^2) as influenced by the continuous application of herbicides (2002-2006).

	Seasons					
Treatments	**2002**	**2003**	**2004**	**2005**	**2006**	**Mean**
Untreated	0.242 f	0.235 f	0.203 f	0.181 f	0.191 f	0.208 *C*
Thiobencarb	2.130 b	1.975 b	0.886 d	0.496 e	0.496 e	1.195 *B*
Bispyribac	2.310 a	2.110 b	1.460 c	0.863 d	0.863 d	1.519 *A*
Mean	1.561 A	1.440 A	0.850 B	0.513 C	0.506 C	

Means followed by the same letters with a same style are not significantly different at the 5% levels, according to DMRT.

As for weed control treatments, it is clear from the results in table (6) that both chemical weed control treatments significantly increased grain yield of rice than the untreated check plots. Rice plots treated by bispyribac for weed control produced grain yield significantly higher than those treated with thiobencarb. The higher grain yield with bispyribac treatment may attributed to the high efficiency of this treatment against grassy weed and production of higher number of rice panicles/unit area as obtained **Hassan *et al* (2004)**.

With respected to the effects of five seasons of application, data in Table (6) showed that with the repeated application for more than two years, significant reduction in rice grain yield was occurred, while no significant change was observed in grain yield of rice after four years of continuous application. The considerable reduction in rice grain yield after the second season of the herbicidal application may be related to the considerable weed shifting and the changes in weed/crop interference as reported by **Radosivish *et al*** (1996).

Regarding the effect of interaction between weed control treatments and five seasons of continuous application on rice grain yield, it is obvious from data in Table (6) and Fig.(6) that grain yield of rice was greatly affected by this interaction during all seasons of application. Using either bispyribac or thiobencarb for weeding in rice plots significantly increased grain yield as compared to the unweeded plots. Except for second season, the application of bispyribac significantly surpassed thiobencarb treatment in rice grain yield. The superiority of bispyribac treatment in rice yield may be related to the high efficiency of this treatment against grassy weeds and achieving larger number of panicles per unit area as obtained by **Hassan *et al* (2006).** In addition it is clear from Table (6) and Fig. (6) that with the continuous application for either thiobencarb or bispyribac after two years, significant reduction in rice grain yield was recorded during third and fourth season of application. However, no significant changes were observed between fourth and fifth seasons of continuous chemical weed control application. On the other hand, no significant changes were recorded between five seasons under the untreated plots. The sever reduction in rice grain yield especially after three years of continuous herbicidal application may be related the severe changing in weed communities complex and population due to these treatments which may adversely affected rice production as reported by **Radosevich *et al* (1996)**.

CONCLUSION

Based on results obtained in this study, it could be concluded that:

1- Grassy weed shifting is expected after more than two years of thiobencarb and bispyriac application in broadcast-seeded rice.
2- The changes in grassy weeds communities and populations may cause advere effects on rice productivity.
3- To overcome such problems, more studies are needed to identify the best sequences of herbicidal application and to employ the integrated weed management to reduced the reliance on chemical weed control.

Figure (1): Fresh wt. (g/m²) of *Echinochloa crus-galli* as influenced by the continuous application of herbicides (2002-2006).

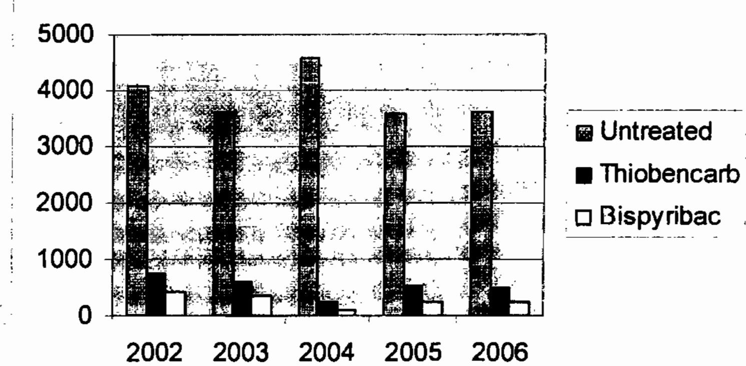


Figure (2): Fresh wt. (g/m²) of *Echinochloa colona* as influenced by the continuous application of herbicides (2002-2006).

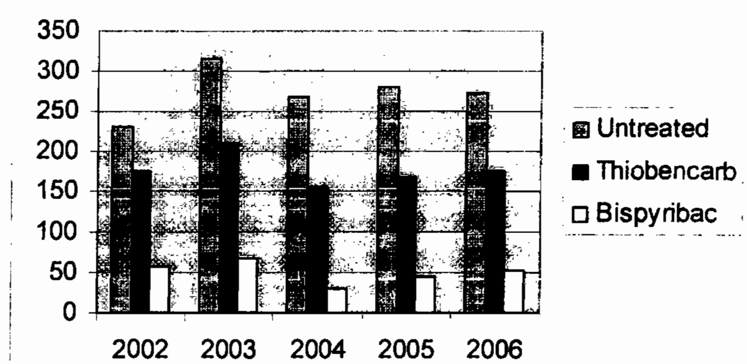


Figure (3): Fresh wt. (g/m^2) of *Digitaria sp.* as influenced by the continuous application of herbicides (2002-2006).

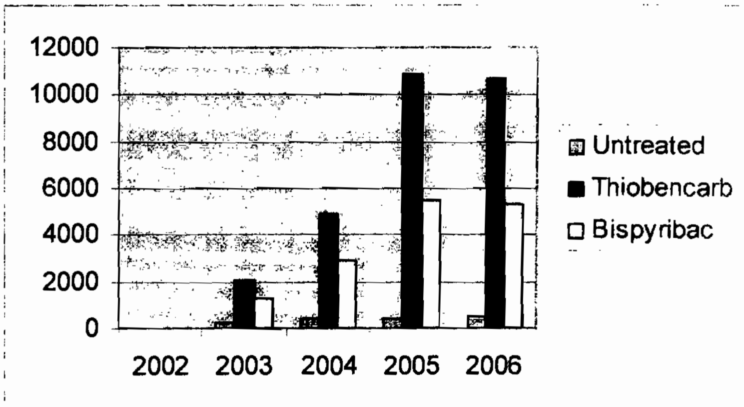


Figure (4): Fresh wt. (g/m^2) of total grassy weeds as influenced by the continuous application of herbicides (2002-2006).

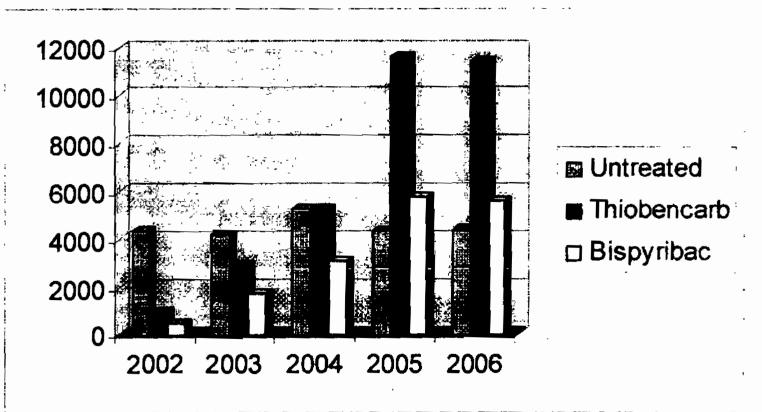


Figure (5): Panicles/m^2 as influenced by the continuous application of herbicides (2002-2006).

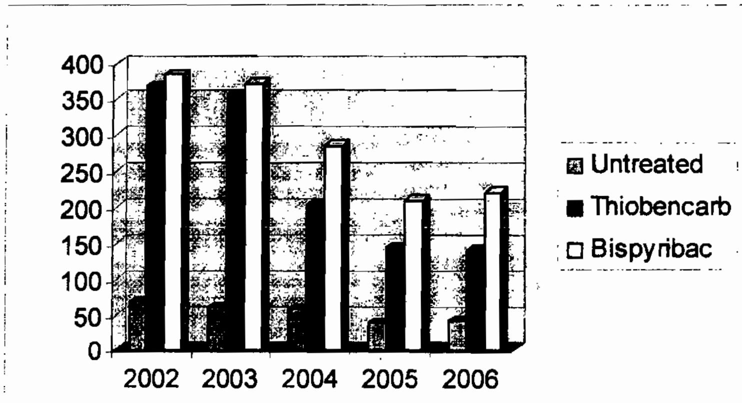
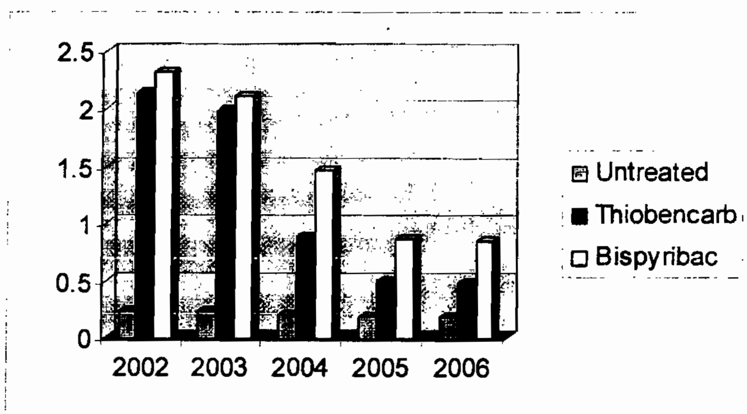


Figure (6): Grain yield kg/plot (3m^2) as influenced by the continuous application of herbicides (2002-2006)



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الملخص العربي

تغير السيادة النوعية للحشائش النجلية وأثر ذلك علي الإنتاجية بسبب الاستخدام المستمر لمبيدات الحشائش في الأرز البدار

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معهد بحوث المحاصيل الحقلية مركز بحوث الأرز –سخا– كفر الشيخ

إجريت دراسة طولية المدي لمدةخمسة سنوات متتالية في الصوبة السلكية بمركز البحوث والتدريب في الأرز بسخا –كفر الشيخ خلال السنوات ٢٠٠٢ حتي ٢٠٠٦ وتهدف الدراسة الي تحديد استجابة وسلوك الحشائش النجلية و محصول الأرز للأستخدام المستمر سنويا لأثنين من

المبيدات الموصي بها لمكافحة الحشائش في الأرز البدار وهما مبيد الساترين ٥٠% بمعدل ٣،٦ كجم مادة فعالة للهكتار يضاف بعد ١٠ أيام من البدار ومبيد النوميني ٢% بمعدل ٠.٠٤ كجم مادة فعالة للهكتار حيث يضاف رشا بعد ٢٥ يوم من بدار الأرز وقد طبقت هذه المعاملات سنويا في خمسة مواسم متتالية لنمو الأرز.

إظهرت النتائج ان توليفة أنواع الحشائش النجلية في الأرز البدار قد تغيرت تغيرات شديدة إعتبارا من الموسم الثالث لاستخدام المعاملات الكيماوية حتي العام الخامس مقارنة بموسم البداية في التطبيق وقد أظهرت حشائش الدنيبة وأبوركبة وخشيشة الدفيرة سلوكيات مختلفة خلال السنوات الخمس وفقا لمعاملة مكافحة الحشائش. وقد حققت حشيشة الديجتريا(الدفيرة) السيادة التامة علي باقي الأنواع خاصة مع الأستخدام المستمر لمعاملة الساترين خلال خمسة سنوات متتالية. وقد تراوحت نسب السيادة بهذه الحشيشة من ٠,٢٣ الي ١١% ، ٠,٨٦ الي ٩٤% ومن ١,٠١ الي ٩٥% من ٢٠٠٢ الي٢٠٠٦ في الغير معامل مقارنة بالساترين والنوميني علي التوالي.

ومن ناحية الأرز صنف سخا ١٠٤- ادي الأستخدام المستمر الي حدوث النقص المنوي في عدد السنابل ومحصول الحبوب اعتبارا من الموسم الثالث حتي الموسم الخامس للتطبيق مقارنة بالموسم الأول.