J. Agric. Sci. Mansoura Univ., 27(11): 7215 - 7222, 2002

STUDY OF RELATIONSHIP BETWEEN NATURAL WEED POPULATION DENSITIES AND WINTER CROPS SEQUENCE ON WHEAT PRODUCTIVITY.

Shrief, I.M. and A.N.M. Nassar.
Weed Research Central laboratory, Agric., Res., Center, Giza, Egypt.

ABSTRACT

Three field experiments in 1998/1999 and 1999/2000 winter seasons were carried out at El-Gimmeza Agricultural Research Station, El-Gharbiea Governorate to estimate yield losses due to weed competition as well as to the role of preceding winter crops and preceding weed control treatments in wheat on weeds and wheat productivities. Polynomial regression was carried out to correlate the number and weight of total weeds/m^2 to wheat productivities. Results indicate that 50 weed/m^2 at one month from sowing decreased number of spikes by 5.4% and wheat production by 6.7% compared to the weed free treatment, meanwhile, 100 weed species/m^2 decreased number of spikes and wheat productivity by 14.6 and 14.0%, respectively, compared to the weed free treatment. Results showed that one-kilogram of weeds/ m^2 decreased wheat yield by 24.0% compared to the weed free treatment. Preceding winter crops or preceding weed control treatments can play a role in decreasing weed population in succeeding wheat where Clover as a forage crop accounted for the significant reduction in fresh weight of broad-leaved and grassy weeds by 58.7and 39.1%, respectively, and increased wheat grain yield by 156.7% compared to untreated check. Preceding weed control treatments by isoproturon at rate of 1.25 L/fed. with one hand weeding after 45 days from sowing reduced significantly fresh weight of annual broad-leaved and grassy weeds by 42.7 and 54.3%, respectively and increased yield of wheat by 83.0% compared to check. Thus, it is recommend to take in consideration the role of preceding clover and preceding weed control treatments in wheat for improving production.

INTRODUCTION

Wheat is an important strategic crop in Egypt. The productivity of this crop is affected mainly by weeds prevailed in fields especially grassy and broad leaved causing great yield reduction. Thus, there is a need to use different weed control measures with less use of herbicides. Such system need field crop inspection to determine the level of weed Infestation prior applying herbicides which helps to cut use of herbicides by spraying infested fields with weeds according to the level of weed infestation to be controlled. This needs to determine the economic level weed infestation. Such relationship between weed density and wheat crop was studied by many researchers as El-Maghraby, *et al.* (1994 b) and Al- Marsafy, *et al.* (2001). This can be achieved by studying the relationship between the different levels of weed infestation in wheat fields. Poole and Gill (1987a) described the relationship between brome grass & wheat and grass & wheat but they preferred to develop wheat crop loss prediction from two or more weed species mixtures. Hassanein *et al.* (1999 b) studied the relationship between level of weed infestation and wheat reduction, they found that the increasing in weeds density decreased wheat yield. This in one side and another is to use suitable crop sequences which decrease the weed infestation like crop sequences which included cutting crops as clover O'Donovan (1988), AL-

Marsafy and Hassanein (1998), (El Maghraby, *et al.* 1994 a), Hassanein *et al.* (1999 a) and barley as Wilson and Phipps (1985). The use of suitable herbicides as Arelon Al Mashed, *et al.* (1993), Salem *et al.* (1994) and AL-Marsafy *et al.* (1992).

Thus, the present study was starting in 1998/99 winter season to know the relationship between the different levels of weed infestation in wheat fields for taking the decision of weed control and know the role of clover and different weed control treatments in wheat on reducing the reserves of weed seeds in soil in order to keep the wheat plants out of weed competition and to gain consequent increases in wheat yield

MATERIALS AND METHODS

These experiments were conducted at El-Gemmieza Agricultural Research Station, in El-Gharbia governorate for studying the relationship between natural weed population densities and wheat yield productivity and the effect of crop sequences (clover and wheat) as preceding winter crops on weed infestation and wheat production in two parts as follow:-

Part I: - Relationship between natural weed population densities and yield of wheat crop

Two field experiments were carried out in 1999/2000 season. Plot area was 2 m^2 grown with wheat variety Sakha 69. In every experiment 80 plots of wheat were left to natural weed infestation except four plots, which were chosen randomly to be cleaned from weeds as needed to present the weed free treatment. At one month from sowing, weeds were count in the middle 1m^2 of the plot and recorded to correlate number of weeds and number of spikes as well as wheat grain yield ardab/feddan as estimated by polynomial regression. At harvest time, number of spikes as well as wheat yield from the middle 1 m^2 of every plot was recorded in the first experiment. The expected yield losses at different weed densities are presented in table (1) At two months from sowing weeds were hand pulled from the middle one square meter from each plot and wheat yield ardab/feddan from one square meter was estimated in the second experiment. Polynomial regression between fresh weight and wheat grain yield was done to estimate yield losses. The expected yield losses at different levels of weeds fresh weight are presented in table (2)

Part II: - Effect of crop sequences and weed control treatments on wheat and associated weeds.

These two experiments were conducted during 1998/99 and 1999/2000 seasons. In the 1st season the treatments included: -

1-Sowing wheat with Isoproturon [N- (4- isopropylphenyl)- N - N - dimethyurea], known commercially as "Arelon 50 % FL.", it was applied at 2-4 leaf stage of wheat plants as post - emergence at the rate of 1.25 l/fed.
2- Sowing wheat with Arelon 50% at the rate of 1.25 l/fed followed by one hand weeding at 45 days after sowing.
3- Sowing wheat with hand weeding twice (45 and 60 days after sowing).
4- Sowing wheat with unweeded check.
5- Clover without any weed control treatments (4 cuttings).

Wheat (Sakha 69 c.v) and clover (Meskawi c.v) were sown with seeding rates 60 and 20 kg/fed respectively. Sowing date was the third week of November. The other normal agricultural practices for every crop growing in the region were done according to local recommendations. The plot area was 21 m^2 in 4 replicates

The herbicidal treatments were sprayed with a knapsack sprayer equipped with at rate 200 liter of water per fed. and clover plots were left without any treatments. Concerning statistical analysis of weeds in clover the four cuttings were considered as treatments as treatments.

In 1999 summer season, experiments was sown with maize and in 1999/2000 winter season, all experimental plots were planted with wheat and all cultural practices were carried out without any weed control treatments, All five treatments were arranged in a Randomize Block Design in both seasons.

Obtained data were subjected to the proper statistical analysis and least significant differences at 5% were used for comparison between means according to Steel and Torrie (1980).

.After 2-month weed survey was carried out in the middle 1 m^2 of each plot in clover and four weed control treatments in the first season and from five treatments in the second season. Weeds were classified into two types broad-leaved and grassy weeds. At harvest, wheat grain yield ardab/fed was computed.

RESULTS AND DISCUSSIONS

Part I:- Study the relationship between natural weed population densities and wheat yield.

The most dominant weed species recorded in wheat fields during the two winter seasons were *Beta vulgaris* (wild Beet), *Brassica nigra* (kaber), *Capsella bursa pastoris* (shepherd's purse), *Chenopodium album & Chenopodium murale* (lambsquarter), *Convolvulas arvensis* (field bind weed), *Coronopus squamatus* (watercress), *Emex spinosus* (sping Emex), *Euphorbia helioscopia* (sun spurge), *Euphorbia peplus* (petty spurge), *Lolium perenne* (Italian rye grass), *Lolium temulentum* (rye grass), *Avena fatua* (wild oat), *Malva parviflora* (cheese weed), *Medicago polymorpha* (bur clover), *Phalaris minor & Phalaris paradoxa* (canary grass), *Polypogon monspeliensis* (rabbit foot grass), *Rumex dentatus* (dock sorrel), *Solanum nigrum* (black night shade), *Sonchus oleraceus* and *Sonchus asper* (annual sowithistle).

A1 Relationship between weed population densities, number of spike/m^2 and wheat productivity.

Concerning the effect of total weeds density/m^2 on wheat yield, results in table 1 indicated that 50 weeds density/m^2 decreased wheat yield by 6.7 % and number of spikes/ m^2 by 5.4% compared to the weed free treatment. In conclusion, increasing weed density/m^2 decreases wheat yield, meanwhile 100 weeds density/m^2 decreased number of spikes and wheat productivity by 14.6and 14.0%, respectively, compared to weed free treatment.

Table 1: Relationship between total weeds density, number of spike m^2 and wheat yield at El-Gimmeza Res., station in 1999/2000 winter season.

Weed density /m^2	Number of spikes		Wheat yield	
	m^2	Reduction %	ardab/fed	Reduction %
0	618.8	0	21.49	0
50	585.5	5.4	20.05	6.7
100	528.4	14.6	18.49	14.0
150	499.8	19.2	17.22	19.9
200	473.6	23.5	16.02	25.5
250	447.4	27.7	14.88	30.8
300	423.6	31.5	13.75	36.0
350	399.8	35.4	13.75	36.0
400	376.0	39.2	13.44	37.5
450	354.6	42.7	10.96	49.0
500	333.2	46.2	9.09	57.7
550	314.2	49.2	8.37	61.0
600	295.1	52.3	7.65	64.4

$Y = 259.812 - 0.284\ x + 0.0007860\ x^2$
$Y = 470.404 - 17.535\ x + 1.856\ x^2$

A2 Relationship between weed weight and wheat productivity.

Results in table 2 indicated that one kilogram of fresh weight of annual weeds can decrease wheat yield by 24% and 2 kg of weeds by 46.2% compared to the with weed free treatment.

The previous treatment can help to predict the losses in wheat yield infestation and taking the decision of weed control which depend on weed density and the class of weeds i.e. broadleaf or grassy or both. These results are in agreement with results obtained by Poole and Gill (1987 b), they indicated that weed density is more easily estimated than weed biomass and the decisions on control practice are made as soon crop emergence where weed biomass may have little relevance. The use of weed mixture in the present study avoided the problem of the competitiveness relationship of the remaining weeds and the crop as mentioned by Haizel and Harper (1973), Spitters and Van den Bergh (1982) and Kirkland and O' Sullivan (1991)

Table 2: Relationship between fresh weight of weeds and grain yield ardab/fed, at El-Gimmeza Res., station in 1999/2000 winter season.

Weed weight g/m^2	Wheat grain yield ardab/fed	Reduction %
0	29.69	0
1000	22.58	24.0
2000	15.97	46.2
3000	10.78	63.7
4000	7.03	76.3
5000	4.68	84.2
6000	3.75	87.4

$Y = 1091.524 - 0.3112\ x + 0.0\ x^2$
$R = -0.9463$
$R^2 = 0.8954$

Part II:- Effect of preceding winter crop sequences and weed control treatments on wheat and associated weeds.

1 St year of crop sequences.

A- Effect of wheat and weed control treatments:

1- On weed

Data presented in Table 3 indicated that all herbicides treatments and hand hoeing were effective in reducing significantly the number and fresh weight of annual weeds. In 1998/99 winter season, taking into account the effect on grassy weeds it is quite clear that all weeds management treatments were significantly better than the check. Arelon applied in combination with hand removal once in wheat appeared with distinct superiority of weed control (98% reduction) compared to untreated check. The highest efficacy were obtained by the use of Arelon plus one hand weeding significantly reduced the fresh weight of annual broad-leaved and grassy weeds by about (98%), followed by Arelon alone by about (97%) and hand weeding twice by about (64%), respectively, compared to untreated check.

Table 3: Effect of weed control treatments on number and fresh weight of weeds g/m^2 and grain yield of wheat at El-Gimmeza Res., Station in 1998/99 winter season.

Weed control treatments	Grassy weeds				Broad leaved weeds				Wheat grain yield ardab /fed.
	No./ m^2	Reduction %	F. W (g/m2)	Reduction %	No./ m^2	Reduction %	F. W (g/m2)	Reduction %	
Arelon 50% FL at 1.25 l/fed.	107.5	91.9	197	96.1	109.0	91.8	207.0	96.7	15.43
Arelon + hand weeding once	32.3	97.6	148	97.1	32.3	97.6	148.0	97.6	16.95
Hand weeding (twice)	355.5	73.1	1873	63.2	360.8	72.7	2245.0	63.7	12.23
Untreated	1323	0	5091	0	1323.8	0	6190.0	0	5.17
L.S.D. at 5%	159.8		395.8		159.4		385.4		3.754

2- On wheat productivity

It is clear from Table 3 that all weed control treatments increased significantly grain yield (ardab/fed.). Applying Arelon and hand weeding once gave best grain yield ardab/fed.(16.95) compared.to untreated check (5.17), followed by Arelon alone and hand weeding twice.

B- Effect of clover cuttings on weeds population:

Results in Table 4 indicated that clover crop accounted for the significant reduction in fresh weight of broad-leaved and grassy weeds species to reasonable extent as a result of repeated cutting. Both *Medicago spp* and *Brassica kaber* declined completely after the first cut , meanwhile both *Phalaris spp* and *Beta vulgaris* were declined by 96 and 86%,respectively, after fourth cut. Such results assert the important of frequent cutting of clover plants for reducing existed weed extensively.

Table 4: Effect of Clover cutting on number of broad - leaved and grassy weeds/m^2 at El-Gimmeza Res., Station in 1998/99 winter season.

No of cuttings	Number of annual weeds/m2									
	Grassy weeds		Broad - leaved weeds						Total annual Weeds	
	Phalaris spp		*Medicago spp*		*Brassica kaber*		*Beta vulgaris*			
	No./ m^2	Reduction %	No./ m^2	Reduction %	No./ m^2	Reduction %	No./ m^2	Reduction %	No./ m^2	Reduction %
The first cut	886.5	0	16.5	0	35	0	29.5	0	81.0	0
The second cut	417.6	53	0	100	0	100	10.5	64	63.5	56
The third cut	61.0	93	0	100	0	100	6.0	80	99.0	93
The fourth cut	33.8	96	0	100	0	100	4.2	86	100.2	96
L.S.D. at 5%	100.2						10.1		102.7	

2 nd year of crop sequences.

Effect of preceding clover and preceding weed control treatments on weeds and wheat productivity:

1- On weeds.

Table 5 indicates that the preceding weed control treatments gave less reduction percent in the density of all weeds. While clover (four cuts) as preceding crop for wheat gave a good reduction percent in the density of *Medicago* sp., *Rumex dentatus* and *Avena fatua*. In general, the clover treatment as preceding winter crop is better in reducing weed population than the other treatments. Data in Table 5 reveal that all preceding weed control treatments reduced significantly the fresh weight of both broad-leaved and grassy weeds. The highest reduction percentages of broad-leaved weeds were obtained by crop sequence clover/wheat (4 cutting) 58.7% followed by wheat/wheat with applying isoproturon plus hand weeding once 42.7% compared to unweeded treatment. For grassy weeds the application of isoproturon plus hand weeding once reduced significantly the fresh weight by 54.3%, followed by clover/wheat (4 cutting) 39.1%. Data in Table 5 indicates that the fresh weights of total weeds were reduced significantly by weed control treatments. The highest reduction percentage was obtained with applying isoproturon plus hand weeding once (50.9%) followed by clover/wheat (4 cutting) 44.9%.

Data in Table 5 reveal that all previous weed control treatments reduced significantly the fresh weight of both broad-leaved and grassy weeds. The highest reduction percentages of broad-leaved weeds were obtained by crop sequence clover/wheat (4 cutting) 58.7% followed by wheat/wheat with applying isoproturon plus hand weeding once 42.7% compared to unweeded treatment. For grassy weeds the previous application of isoproturon plus hand weeding once reduced significantly the fresh weight by 54.3%, followed by clover/wheat (4 cutting) 39.1%. Data in Table 5 indicates that the fresh weight of total weeds reduced significantly by previous weed control treatments. The highest reduction percentage was obtained with applying isoproturon plus hand weeding once (50.9%) followed by clover/wheat (4 cutting) 44.9%.

Table 5: Effect of preceding clover preceding and weed control treatments in wheat on fresh weight of different weeds g/m^2 and yield of wheat at El-Gimmeza Res., Station in1999/2000 winter season.

Preceding winter crops and weed control treatments. 1998/99	1999/2000	Fresh weight of annual weeds (g/m^2) Grassy weeds: *Avena Fatua*	Grassy weeds: *Phalaris spp*	Grassy weeds: Total grasses	Grassy weeds: Redu-ction %	Broad leaved weeds: *Medicago spp*	Broad leaved weeds: *Beta vulgaris*	Broad leaved weeds: *Rumex dentatu*	Broad leaved weeds: Total broad-leaved	Broad leaved weeds: Redu-ction %	Total: Annual weeds	Total: Redu-ction %	Wheat grain yield: ardab/ fed.	Wheat grain yield: Reduction %
Wheat + Arelon 50% FL at 1.25 l/fed.	Untreated wheat	447.0	3087.5	3534.5	26.86	445.8	729.8	253.0	1428.6	29.36	4963.1	27.59	6.78	41.5
Wheat + Arelon +hand weeding once	Untreated wheat	288.5	1920.0	2208.5	54.30	440.3	533.5	184.5	1158.3	42.73	3366.8	50.88	8.77	83.0
Wheat + Hand weeding (twice)	Untreated wheat	558.8	3531.3	4090.1	15.36	401.5	767.3	289.5	1458.3	27.89	5548.4	19.05	5.86	22.3
Wheat + Untreated	Untreated wheat	789.8	4042.5	4832.3	0	555.3	1011.0	456.3	2022.6	0	6854.9	0	4.79	0
Clover (4 cuts)	Untreated wheat	418.3	2525.3	2943.6	39.08	179.0	440.0	216.8	835.8	58.67	3779.4	44.86	12.30	157
L.S.D. at 5%		202.1	1120.5	1103	0	119.7	N.S	75.1	277	0	–	0	1.821	0

These results were in agreement with those obtained by Nalewaja (1968), Wilson and Phipps (1985), Sutton (1987), O'Donovan. (1988), Al-Marsafy et al. (1992), Bell (1992), Al-Maghraby, *et al.* (1994 a) and Salem *et al.* (1994).

2- On wheat productivity.

Data in Table (5) indicates that wheat grain production was affected by weed reduction, where it was significant. The highest yield of wheat grains was obtained from crop sequence clover/wheat (12.30 ardab/fed). This could be attributed to the frequent cutting of Clover in that season in addition improving soil fertility, which in turn overcome weed competition to some extent and increase grain yield. Regarding the effect of preceding weed control methods on grain yield as shown in Table (5) it is clear that applying isoproturon alone or in combination with hand weeding once and hand removal twice increased significantly grain yield significantly compared with check. isoproturon followed by hand removal once appeared with significantly superiority in grain yield compared with other management treatments (8.768 ardab/fed.) with increases 83.0% compared to check treatment and this due to the distinct superiority in controlling broad leaved as well as grassy weeds. Thus, we conclude that the best crop sequence for weed control in wheat is to combine clover in the rotation than non rotated wheat. These results werein a good agreement with those obtained by Bell and Nelewaja (1968), Wilson and Phipps (1985), O'Donovan. (1988), Al-Marsafy *et al.* (1992) and Hasanein *et al.* (1999a).

REFERENCES

Al-Mashed, L.E.: A.S.O. Kholosy, and H.M.Ibrahim (1993) Effect of sowing dates and Arelon application on weed control in wheat. N.V.R.P. 2nd Ann. Meet, 8-9 Sep: 61-65 Cairo, Egypt.

AL-Marsafy, H.T.; E.E. Hassanien,: A.N.M. Nassar and F.M. El-ayes.(2001) Estimation yield losses due to grassy weed infestation in wheat under different seeding rates for new variety Sids 6. N.V.R.P. 9th Ann. Meet., 2-6 Sept.,250-261.Cairo ,Egypt.

AL-Marsafy, H.T. and E.E. Hassanien (1998) Effect of crop rotation on the control of wild oat in wheat in Upper Egypt. Egypt. J. Agric.. Res., 76(3): 1085-1097

AL-Marsafy, H.T. and E.E. Hassanien and S. KH. Mahmoud (1992) The potential chemical control of wild oats and other weeds in wheat. J. Agric. Sci. Mansoura Univ., 17 (4) : 705-713.

Bell, D.A. (1992). Weed seed bank response to tillage, herbicides and crop rotation sequence. Weed Sci., 40 : 654 - 659.

Bell and Nalewaja (1968) Competition of wild oat in wheat and barley. Weed Sci., 16 : 505-508.

Bowden, B.A and G. Friesen (1967). Competition of wild oats (*Avena fatua*) in wheat and flax Weed Res., 7:349-359.

Haizel, K.A. and J . L . Harper, (1973) The effects of density and timing of removal on interference between barley, white mustard and wild oats. Jour. of App. Ecology, 10: 23 - 31.

El- Maghraby, M. I. A.; K. G. Salem and S. E. El-Shandidy (1994 a) Effect of crop rotation on the control of *Phalaris* spp and other weeds in winter crops in North Delta. N.V.R.P. 2nd Ann. Meet, 11-15 Sep: 282-288. Cairo, Egypt.

El- Maghraby, M. I. A.; K. G. Salem and S. E. El-Sha (1994 b). Effect of two years crop rotation on the control of wild oats and other weeds in winter crops N.V.R.P. 2nd Ann. Meet, 11-15 Sep: 289-297. Cairo, Egypt.

Hassanein, E.E. ; G.M. Mekhail and M.K. Zahran, (1999 a) Effect of crop rotation on wild oats and other weeds occurrence in winter crops in Middle Egypt. The 17th Asian-Pacific Weed Sci. Soc. Conf Nov. 22-27, Bangkok, Tailand, 152-155.

- Hassanein, E.E.; H.T. AL-Marsafy; M.M. Ibrahim and S.M. Shebl (1999 b) The use of density to predict loss in wheat yield due to weed competition.The 17th Asian-Pacific Weed Sci. Soc. Conf Nov. 22-27, Bangkok, Thuiland, 668-671.

Kirkland, K.J. and O'Sullivan (1991)Competition of Canadian prairie spring wheat with oats (*Avena fatua*). Canadian. J. Plant Sci., 9 : 341-353.

O'Donovan. J.T. (1988). *Avena fatua* infestation and economic returns as influenced by frequency of control. Weed Tech., 2 (4) : 495-498.

Poole, M. L. and G. S. Gill (1987 a) Competition between crops and weeds in Southern Australia. Plant Protection Quarterly, 2: 86 - 96.

Poole, M. L. and G. S. Gill (1987 b)The use of weed density - crop yield relationships for predicting yield losses in the field. British Crop Prot. Conf. Weeds, 945 - 953.

Salem, K. G. : L .El-Sherif and L. E. Mashad (1994). Effect sowing dates and Arelon application on weed control in wheat N.V.R.P. 2nd Ann. Meet, 11-15 Sep: 311- 316 Cairo, Egypt.

Steel, R.G.D and J.H. Torrie (1980) Principal and procedures of Statistics A biometrical approach. Mc Grow Hill Book Company - second Edit.

Sutton , P .B (1987) The control of annual grass weed in cereals in France. The Federal Republic of Germany and Great British with tralkoxydium, A new selective herbicide. British Crop Prot . Conf . Weeds, 389-390 .

Spitters, C. J. T.; J. P. Van den Bergh (1982) Competition between crop and weeds: A system approach. In: Biology and Ecology of weeds W. Holzner and N. Numata (Eds).The Hague: De W. J. Junk publishers, 137 - 148.

Wilson, B.J and P.A Phipps (1985) Along term experiment on tillage, rotation and herbicide use for the control of *Avena fatua* in cereals .British Crop Prot. Conf. Weeds, 693-700 .

دراسة العلاقة بين كثافة الحشائش والتعاقب المحصولى وطرق مكافحة الحشائش على إنتاجية محصول القمح.

إبراهيم محمد شريف و أكرم نصارمحمد نصار
المعمل المركزى لبحوث الحشائش - مركز البحوث الزراعية- الجيزة - مصر

أقيمت ثلاثة تجارب حقلية بمحطة بحوث الجميزة الزراعية - محافظة الغربية خلال الموسمين الشتويين ١٩٩٨/٩٩ , ١٩٩٩/ ٢٠٠٠ وذلك تgقدير الخسائر الناجمة عن وجود الحشائش و]دراسة تأثير التعاقب المحصولى على إنتاجية محصول القمح. وقد شملت كل من التجربتين الأولى والثانية على عدد ثمانون قطعة تجريبية موزعة توزيعا عشوائيا تركت بدون نقاوة للحشائش فيما عدا أربع قطع تمت فيها عملية النفاوة وقد قدر فى التجربة الأولى عدد الحشائش بعد شهر من الزراعة والمحصول عند الحصاد فى كل قطعة تجريبية , كما قدرت أوزان الحشائش فى مساحة واحد متر مربع فى التجربة الثانية بعد شهرين من الزراعة والمحصول عند الحصاد وذلك لدراسة الإرتباط بين أعداد وأوزان الحشائش من جهة وعدد السنابل والمحصول الإقتصادى من جهة أخرى. كما أقيمت تجربة ثالثة مستديمة لمدة سنتين عبارة عن قمح مع أربعة معاملات عبارة عن أريلون بمعدل ١,٢٥ لتر/فدان بمفرده ثم مصحوب بعملية نقاوة بعد ٤٥ يوم من الزراعة ومعاملة النقاوة بعد ٤٥ , ٦٠ يوم من الزراعة وأخيرا معاملة المقارنة (بدون معاملة) وبرسيم نم حشه أربعة حشات ثم تركت الأرض فى الصيف بدون خدمة حيث زرعت بمحصول الذرة ثم زرعت كلها فى فصل الشتاء الثانى بمحصول القمح بدون أى معاملات لمكافحة الحشائش وذلك لدراسة دور المحاصيل وطرق المكافحة السابقة على إنتاجية محصول القمح التالى.

أوضحت النتائج وجود إرتباط سالب بين كثافة أعداد الحشائش ومحصول القمح حيث أدى وجود ٥٠ حشيشة فى المتر المربع بعد شهر من الزراعة إلى نقص عدد السنابل بمقدار ٥,٤% وتقليل إنتاجية محصول حبوب القمح ٦,٧% ، بينما أدى وجود ١٠٠ حشيشة/ م٢ إلى نقص عدد السنابل بمقدار ١٤,٦% وإنتاجية محصول حبوب القمح بمقدار ١٤,٠% وذلك مقارنة بالقطع التى تمت فيها عملية النقاوة. وكانت هذه العلاقة أيضا واضحة بين وزن الحشائش ومحصول القمح حيث أدى وجود واحد كيلو جرام فى المتر المربع بعد شهرين من الزراعة إلى نقص فى إنتاجية محصول الحبوب بمقدار ٢٤,٠% مقارنة بالقطع التى تمت فيها عملية إزالة الحشائش .من هنا يتضح أن الخسائر تزداد مع زيادة الحشائش سواء من حيث عددها أو أوزانها.

أظهرت النتائج فى التجربة الثالثة تفوق محصول القمح بعد برسيم عن التعاقب قمح/قمح فى الحشائش العريضة والضيقة والكلية بمقدار ٥٨,٧% ، ٣٩,١% ، ٤٤,٩% على الترتيب وزيادة المحصول بمقدار(١٥٦,٨%) بالمقارنة بمعاملة الكونترول (قمح/ قمح بدون معاملة)، كما أدى إضافة مبيد الآريلون بمعدل ١,٢٥ لتر/فدان مع نقاوة مرة واحدة بعد ٤٥ يوم من الزراعة إلى نقص وزن الحشائش العريضة والضيقة والكلية بمقدار٤٢,٧% ، ٥٤,٣% ، ٥٠,٩% على الترتيب وزيادة فى المحصول بمقدار ٨٣,٠% بالمقارنة بمعاملة الكنترول.

من هنا يمكن التوصية آخذيين فى الإعتبار دور محصول الموسم السابق (برسيم) والمكافحة السابقة للحشائش فى محصول القمح والتى تساهم فى تخفيض الحشائش فى محصول القمح اللاحق وزيادة إنتاجيته عن إستمرار زراعة القمح بدون إتباع دورة زراعية.