

EVALUATION OF SOME WEED CONTROL TREATMENTS ON DODDER (*Cuscuta planiflora*), TEN CONTROL IN EGYPTIAN CLOVER (*Trifolium alexandrinum* L.)

Soliman, I. E.

Weed Res. Laboratory, Field Crops Res. Institute, Agric. Res. Cent., Giza, Egypt

ABSTRACT

Two field experiments were conducted during the two successive seasons of 2006/07 and 2007/08 at Sakha Agriculture Research Station, Egypt, to investigate the efficacy of some herbicides i.e. Buralin, Roundup, Herbazed and Herphosate in addition to the hand combing for controlling dodder weed (*Cuscuta planiflora*), *Ten*, and their effects on some growth characters and seed yield of clover plants (*Trifolium alexandrinum* L.).

Results indicated that Roundup herbicide showed good control of dodder followed by Herbazed, Butralin and Herphosate treatments. Also, showed that dodder weed caused a great decrease in plant height, fresh, dry weight and seed yield of clover plants. Also, the results indicated that the hand combining treatment was not enough in dodder control, but it used only as a factor in control programs.

Clover plants infested with dodder showed the lowest chlorophyll a, b and highest carotene contents. Data also, cleared that different herbicide treatments showed least decreased on chlorophyll a and b and increased carotene content compared to un-infested and untreated plants. Data also, revealed that most herbicidal treatments slightly decreased protein content of clover plants. These results indicate that under heavy infested soil with dodder, it is possible to use of herbicides i.e. butralin, Roundup, Herbazed and Herphosate. These practices gave the highest reduction in dodder injury and increased clover yield and its components.

INTRODUCTION

Egyptian clover (*Trifolium alexandrinum* L.) which locally named berseem is the main forage crop for animal in Egypt. It has a super qualitative characters such as the high nutritive value and crude protein content. It is used for animal feeding in fresh form during the winter and spring seasons, however the rest of animal feeding in this period can be stored as a hay for animal feeding in the summer season.

Dodder (*Cuscuta planiflora*, *Ten*) is known to be the main pest attacking the Egyptian clover in Egypt, while other species of dodder have been reported on some other plants in different locations in Egypt (Tackholem, 1965). Al-Shair (1989) mentioned that (*Cuscuta planiflora*) decreased (*Trifolium alexandrinum*) fresh and dry weights at the first and second cuts, the number of seed in florescence, seed yield and germination percentage and increased seeds number/g.

Satisfactory dodder control in clover and alfalfa were obtained by glyphosate (Graph *et al.*, 1985; Dawson, 1990 and 1992 and Heap, 1992). Glyphosate herbicide had no adverse effect on growth and development of berseem (Bhan and Balyan, 1982).

Abd El-Wahed (1996) found that glyphosate at (400 g a.i./fed) gave (94-97 %) control of (*Cuscuta* spp.) in Egyptian clover. The half rate (200 g

a.i./fed) gave the same results (90-92 %) control, while glyphosate at (100 and 50 g *a.i./fed*) was less effective on (*Cuscuta* spp.) than the first and second rate. Also, Molnar *et al.*, (1998) showed that Roundup Bioforce (glyphosate) at 0.8 l/ha was the most effective herbicides tested against (*Cuscuta* spp) in various crops, reducing weed abundance by 98%, followed by Roundup Bioforce of 0.6 l/ha (97% reduction) and Roundup (glyphosate) at 0.6 l/ha (94%). Zaki *et al.*, (1998) applied glyphosate (0.5 – 1.125 l/ha) on Egyptian clover (*Trifolium alexandrinum*) to control dodder (*Cuscuta* spp.) in clover. The results showed that glyphosate gave good control of dodder.

Salimi and Maillet (1998) mentioned that the results of field trials conducted in Iran to assess the efficacy of single and split application of 75 – 300 g/ha glyphosate for control of (*Cuscuta planiflora*) in alfalfa (*Medicago sativa*) indicated that split applications each of 150 – 300 g/ha gave 71.1 – 94 % weed control and increased crop yields by 231 – 300 %.

Ahmed *et al.*, (1995) studied the efficiency of different herbicide bentazon and glyphosate on growth Egyptian clover (*Trifolium alexandrinum* L.). They indicated that glyphosate herbicide showed good control of dodder followed by bentazon treatment. The parasitic weed caused a great reduction in height, fresh and dry weights of clover plants. The plants infected with dodder showed the lowest chlorophyll (a and b) and highest carotene contents as comparing with healthy plants. Also, data cleared that different herbicide treatments decreased chlorophyll a and b, and decreased carotene as compared to untreated healthy plants.

Al-Menoufi and Hassan (1977) found that the protein content, yield of fresh and dry matter and the nutritive value of plant materials were reduced in Egyptian clover plants infested with (*C. planiflora*).

Abd El-Wahed (1996) found that glyphosate was less effective on protein in Egyptian clover after 0, 1 and 3 days post-treatment. The high rate 400 g *a.i./fed* of glyphosate was more effective on protein content. The glyphosate effect was decreased by the decreased of the used rate.

Soliman (2002) indicated that the hand combing treatment was not enough in dodder control, but it used only as a help factor in control program. Also, the results indicated that butralin herbicide gave good control of dodder followed by propyzamide, glyphosate and imidazolin treatments. Also, showed that the parasitic weed dodder caused a great reduced in fresh weight of clover plants. Dodder weed reduction the chlorophyll and crude protein comparing with healthy plants. Also, cleared that the tested herbicides showed least effective on chlorophyll and protein content.

In addition to quantitative and qualitative decreased in yields of different crop plants, Kingsbury (1967) reported that animals fed on forage infested with dodder are susceptible to serious disease. So, the animal welfare is indirectly affected by the presence of dodder.

Evaluation of herbicides in field crop depends not only on the efficiency of the herbicide to control weeds, but also includes the attaining of crop growth and high quantity and quality of yield. Therefore, the present investigation was conducted to study the effect of some weed control treatments on dodder and their effect on growth characters, yield and its components of clover.

MATERIALS AND METHODS

This study was performed at the Experimental Station, Sakha Agricultural Research during two successive seasons of 2006/07 and 2007/08 to study the effect of some weed control treatments for controlling dodder (*Cuscuta planiflora*) in Egyptian clover (*Trifolium alexandrinum* L.) c.v. Meskawy. Dodder seeds were mixed with soil at 5 % of clover seeds, (w/w). Sowing dates were November 5 and 10 in the two seasons, respectively. The experiments were laid out in a complete randomized block design with four replications. The plot area was 10.5 m² and artificially infested by dodder seed. In this study seven treatments were used as follow:-

1. Amex (butralin 48 % E.C.) at rate of 2.0 l/fed surface application (after sowing and before irrigation).
2. Round up (glyphosate 48 % WSC) at a rate of 0.06 l/fed after two weeks from the cutting and with the appearance of dodder.
3. Herbazed (glyphosate 48 % WSC) at a rate of 0.06 l/fed after two weeks from the cutting and with the appearance of dodder.
4. Herphosate (glyphosate 48 % SL) at a rate of 0.06 l/fed after two weeks from the cutting and with the appearance of dodder.
5. Hand combing, after each cutting.
6. Healthy plants (non-infested).
7. Control (infested).

Herbicides in both investigations were sprayed by a Knapsack sprayer CP3 with water volume of 200 liters per feddan. Nomenclature of herbicides are listed in Table 1. All agronomic practices in clover as land preparation, fertilization and irrigation were done as recommended during the two study seasons.

Cutting dates:

Three cuts were taken to determine the fresh and dry weights for clover (ton/fed) and dodder (kg/fed). The first cut was taken after 50 days from sowing, basal buds were 2.5 to 3.5 cm. The second and third cut were taken at 40 days intervals, while the fourth cut was taken at 30 days after the third cut to determine seed yield (kg/fed).

Table 1: Nomenclature of herbicides used in this investigation.

Common name	Trade name	Chemical name
Butralin	Amex	4-(1,1-dimethylethyl) – N-(1-methylpropyl)-2, 6-dinitrobenzen – amine.
Glyphossate	Roundup	N – (phosphonomethyl) glycine.
Glyphosate	Herbazed	N – (phosphonomethyl) glycine, isopropylammonium salt.
Glyphosate	Herphosate	N – (phosphonomethyl) glycine, isopropylammonium salt.

Studied characters:

* Growth of dodder weed:

- 1- Fresh weight (kg/fed).
- 2- Dry weight (kg/fed).

*** Growth of clover plants:**

- 1- Plant height (cm).
- 2- Fresh weight (ton/fed).
- 3- Dry weight (ton/fed).

*** Crude protein:**

Nitrogen was determined according to the methods outlined by A.O.A.C. (1980) in representative samples of the dried forage for each treatments. Crude protein was calculated by multiplying total nitrogen x 6.25.

*** Chlorophyll and carotene content:**

Chlorophyll and carotene in leaves of clover plants were measured according to Sweeny and Martin (1961). Chlorophyll a, b and carotene were recorded as mg chlorophyll/gm sample (fresh weight). Control treatment carried out using clover leaves that not subjected to any herbicide.

*** Statistical analysis:**

The obtained data were subjected to proper statistical analysis of variance according Snedecor and Cochran (1980) and the least differences (LSD) at 5 % level of significant were calculated.

RESULTS AND DISCUSSION

1- Effect of weed control treatments on fresh and dry weights of dodder weed:

Fresh and dry weights of dodder weed as affected by different herbicide treatments are presented in Table 2 the available results revealed clearly that the fresh and dry weights of dodder weed significantly affected by herbicide treatments.

Table 2: Effect of some weed control treatments on fresh and dry weights of dodder weed (kg/fed) in 2006/07 and 2007/08 seasons.

Characters	Rate (l/fed)	2006/07					
		First cut		Second cut		Third cut	
		F.W.	D.W.	F.W.	D.W.	F.W.	D.W.
Butralin	2.0	42.68	9.08	109.92	16.96	546.0	206.06
Round up	0.06	17.06	1.76	25.20	3.10	268.8	136.50
Herbazed	0.06	36.62	7.82	42.00	8.48	294.0	141.20
Herphosate	0.06	51.32	9.50	138.60	30.58	236.0	159.26
Hand combining	-	95.26	32.60	869.40	82.24	974.4	370.65
Control (un-infested)	-	0.00	0.00	0.00	0.00	0.0	0.00
Control (infested)	-	105.08	39.22	1185.5	132.43	1520.4	489.85
LSD 5 %		9.55	2.93	68.15	11.52	90.30	11.12
		2007/08					
Butralin	2.0	77.86	19.90	161.54	52.34	598.66	203.20
Round up	0.06	43.60	13.10	151.06	44.44	372.38	138.44
Herbazed	0.06	72.66	20.84	169.76	60.40	384.64	164.90
Herphosate	0.06	100.16	32.68	167.00	57.46	497.36	177.82
Hand combining	-	73.66	23.81	670.70	112.57	1223.88	11.57
Control (un-infested)	-	0.00	0.00	0.00	0.00	0.00	0.00
Control (infested)	-	83.03	29.06	1341.27	383.96	1476.85	388.12
LSD 5 %		9.64	3.17	77.20	13.72	79.34	9.41

F.W. = Fresh weight (kg/fed) D.W.= Dry Weight (kg/fed)

In the first cut the highest efficiency in decreasing fresh and dry weights of dodder weed was obtained from Round up, followed by that of Herbazed, Herphosate and Butralin. On the other hand, the highest fresh and dry weights of dodder weed was recorded with hand combing treatment as compared to (control infested) treatments. The same trend was observed in the second and third cuts. Hence do not could be it dependence on dodder (*C. planiflora*) control program, but it used as a help factor. These results are in line with results of Sher and Shad (1989) and Soliman (2002) their reported that manual control (hand plucking) of (*Cuscuta* spp.) does not give effective control. In respect, effect of herbicides on dodder weed are in agreement with those obtained by Ahmed *et al.*, (1995) and Soliman (2002).

2. Effect of weed control treatments on clover yield and its components:

2.1. Plant height of clover:

Data presented in Table 3 show the effect of weed control treatments on plant height (cm) at first, second and third cutting, where it could be noticed that all tested herbicides increased the plant height at the three cuts as compared with the (infested control) treatment, the hand combing treatment approximately slightly increased or equal with infested control treatment.

Data also, revealed that herbicide Round up at the rate of 0.06 l/fed gave the tallest plants which were increased the plant height by about 8.2, 26.54 and 20.02 % at three cuts, respectively, as compared to the infested treatment, followed by Butralin at 2.0 l/fed, Herbazed and Herphosate. The same conclusion was mentioned by Soliman (2002).

Table 3: Effect of some weed treatments on growth of clover plants in 2006/07 and 2007/08 seasons.

Characters Treatments	Rate (l/fed)	2006/07								
		First cut			Second cut			Third cut		
		P.H.	F.W.	D.W.	P.H.	F.W.	D.W.	P.H.	F.W.	D.W.
Butralin	2.0	48.75	6.23	0.92	85.38	9.96	1.28	86.92	11.10	1.46
Round up	0.06	49.50	7.09	1.03	87.48	12.05	1.46	88.25	12.71	1.51
Herbazed	0.06	47.75	6.60	1.01	79.48	8.79	1.24	86.49	10.95	1.42
Herphosate	0.06	47.25	6.42	0.97	76.02	8.67	1.19	83.77	10.43	1.36
Hand combing	-	47.50	5.50	0.87	71.2	7.17	1.11	79.32	8.44	1.23
Control (un-infested)	-	50.75	7.34	1.08	79.53	13.58	1.76	93.64	13.02	1.62
Control (infested)	-	45.75	4.95	0.85	69.13	6.55	1.04	73.53	7.86	1.18
LSD 5 %		3.33	1.75	0.76	2.42	2.36	0.82	5.35	2.84	0.18
		2007/08								
Butralin	2.0	51.90	6.60	0.93	78.64	9.84	1.05	85.73	11.48	1.31
Round up	0.06	53.55	7.56	1.01	81.84	11.68	1.36	89.46	12.82	1.50
Herbazed	0.06	50.75	7.06	0.95	76.48	8.42	1.23	81.97	10.07	1.43
Herphosate	0.06	50.00	6.89	1.01	75.10	8.72	1.16	82.03	10.56	1.39
Hand combing	-	49.30	5.96	0.92	70.26	7.69	1.08	76.75	8.09	1.17
Control (un-infested)	-	53.44	7.79	1.12	83.07	13.82	1.69	91.52	13.19	1.51
Control (infested)	-	47.25	5.37	0.90	67.34	6.05	0.92	72.34	7.86	1.11
LSD 5 %		3.43	1.23	0.19	5.70	1.84	0.21	6.43	2.02	0.18

P.H. = Plant height (cm)

F.W. = Fresh weight (ton/fed)

D.W. = Dry Weight (ton/fed)

2.2. Fresh and dry weight of clover:

As for fresh and dry weights of clover plants, results indicated that untreated plants recorded the highest value. On the other hand, the lowest fresh and dry weights was obtained by plants infested with dodder. This hold fairly true in the three cuts.

Data also, revealed that all studied herbicides significantly increased the fresh and dry weights of clover plants as compared to infested control treatment. These findings were true after three cuts, and this effect was constant from season to another. These results are in agreed with those obtained by Al-Menoufi and Hassan (1977), Al-Shair (1986) and Soliman (2002) they reported that (*C. planiflora*) decreased (*Trifolium alexandrinum*) fresh weight at the first and second cuts.

The most effective treatment for increasing fresh and dry weights of clover plants was obtained from Roundup at the rate of 0.06 l/fed which recorded the highest fresh weight 2.14, 5.5 and 4.85 ton/fed in the first season, and 2.19, 5.63 and 4.96 ton/fed in the second season at three cuts, respectively, as compared with the infested control treatment, followed by Butralin, Herbazed and Herphosate. The superiority of these herbicides against dodder (*C. planiflora*) could be attributed to the continues destroying effect of the sequential application. Butralin recorded the lowest fresh weight of clover during the first cut, because it caused phytotoxicity of clover plants, but clover completely recovered at the end of this cut, also observed that the hand combing treatment recorded the least fresh and dry weights as compared with herbicides.

It is striking that all tested herbicides increased the fresh and dry weights of clover plants as compared to infested control treatment, also it were effective against dodder (*C. planiflora*) but with different rotations, in spite of they had side effects on clover plants, do not find infested of using the herbicides to dodder (*C. planiflora*) control.

2.3. Seed yield of clover:

Data presented in Table 4 showed the effect of weed control treatments on seed yield (kg/fed) at harvest in both seasons.

Data denoted that weed control treatments had a significant effect on seed yield in both seasons. The influence of such treatments on seed yield had the same trend of that of plant height, fresh and dry weights of clover plants.

The hand combing treatment recorded the lowest seed yield (266.94 and 209.54 kg/fed) where seed yield losses from competition reached to (133.56 and 169.98 kg/fed) in two seasons, respectively. These results similar with that obtained by Feesehaie (1992) who reported that yield losses due to (*Cuscuta* spp.) often are serious, but the most severe infestation can cause up to complete crop failure. Also, these results agreed with Soliman (2002).

Comparing results between hand combing treatment and the tested herbicides generally, indicated that the highest increase in seed yield were achieved from herbicide Round up, Herbazed, Butralin and Herphosate. While hand combing treatment gave the lowest seed yield as compared with all tested herbicides. That result showed that single hand combing un-useful

in dodder control, this means is only suitable to avoid competition of dodder weed due to their low weed population density, also observed that all tested herbicides were increased the seed yield of clover with different rotations as compared to infested control treatment and assured on the important of using of the suitable herbicides due to the excepted problem of dodder weed.

3. Effect of tested herbicides on crude protein content:

Data presented in Table 4 show the effect of different herbicidal treatments as well as dodder weed on crude protein of clover plants. The obtained results revealed clearly that the parasitic weed dodder caused a great reduction in crude protein.

Table 4: Effect of herbicides on seed yield (kg/fed) and crude protein contents (mg/g) of clover plants after three cuts in 2006/07 and 2007/08 seasons.

Characters Treatments	Rate (l/fed)	2006/07						Seed//f (kg/f)
		First cut		Second cut		Third cut		
		mg/g	1%	mg/g	1%	mg/g	1%	
Butralin	2.0	17.38	7.80	17.73	8.42	18.11	8.77	292.39
Round up	0.06	16.27	13.69	16.04	17.15	15.67	21.06	351.42
Herbazed	0.06	14.19	24.72	16.37	15.44	16.72	15.77	316.51
Herphosate	0.06	15.75	16.45	14.86	23.24	14.10	28.97	263.57
Hand combining	-							266.94
Control (un-infested)	-	5.67	69.92	5.12	73.55	3.84	80.65	201.38
Control (infested)	-	18.85	0.00	19.36	0.00	19.85	0.00	289.50
LSD 5 %		7.84		8.32		8.75		
		2007/08						
Butralin	2.0	19.54	10.16	20.13	13.60	19.13	17.33	263.81
Round up	0.06	18.74	13.84	17.87	18.02	16.93	26.84	312.44
Herbazed	0.06	16.02	26.34	16.15	30.89	15.55	32.80	233.25
Herphosate	0.06	16.93	22.16	16.33	30.12	15.82	31.63	241.93
Hand combining	-							209.54
Control (un-infested)	-	6.81	68.70	7.26	68.93	6.81	70.57	198.74
Control (infested)	-	21.75	0.00	23.37	0.00	23.14	0.00	379.52
LSD 5 %		8.72		9.82		9.24		31.58

mg/g= weight of total protein determined by mg per gm of clover plants.

1%= percent inhibition of the protein weight was calculated in relation to control.

Also, the results tabulated revealed that the herbicides Roundup, Herphosate and Herbazed had the moderate effect in inhibition of crude protein content, while the herbicide Butralin had the least effect in inhibition of crude protein in the three cuts. These results are in the line with the results of Abd El-Wahed (1996) who found that glyphosate at the rate of 100 g a.i./fed had a moderate effect on crude protein in Egyptian clover, while the last rate 50 a.i./fed had a slight effect on crude protein content as compared with control treatments. Also, these results agreed with Soliman (2002) who reported that the glyphosate herbicide was showed moderate effect as an inhibitory agent for crude protein, while herbicide Butralin had the least effect in inhibition of crude protein after thirty five days from application. Hence, the herbicide were less risk on clover plants.

4. Effect of tested herbicides on chlorophyll and carotene content:

Data presented in Table 5 show the effect of different herbicide treatments as well as dodder weed on chlorophyll and carotene content of clover plants. The obtained results revealed clearly that chlorophyll and carotene were significantly affected by dodder and different herbicide treatments. This was true in three cuts.

The untreated clover plants and un-infested gave the highest chlorophyll a and b contents. On the other hand, the parasitic weed dodder caused a great reduction in chlorophyll a and b contents. In the first cut, chlorophyll a was decreased by (6.06, 14.13, 20.48 and 15.48 %) for clover plants treated by Butraalin, Round up, Herbazed and Herphosate in 2006/07 season and (8.26, 16.01, 22.28 and 15.24 %) in 2007/08 season, respectively.

As for chlorophyll b content, data observed that chlorophyll b was decreased by (20.77, 37.14, 38.57 and 37.80 %) for clover treated by Butralin, Round, Herbazed and Herphosate in 2006/07 season and (22.84, 39.61, 40.37 and 41.45 %) in 2007/08 season, respectively. Generally, the same trend was showed in the second and three cut with slight differences.

Regarding carotene content, data indicated that the parasitic weed dodder caused a great increase in carotene content as compared to healthy plants un-infested. In the first cut, clover plants treated with Butralin, Round up, Herbazed and Herphosate increased carotene by (45.44, 66.59, 72.99 and 66.97 %) in 2006/07 season and (42.75, 55.98, 75.54 and 63.04 %) in 2007/08 season, respectively, as compared to control un-infested and untreated. The same trend was presented in second and third cuts with slight differences. Similar results had been reported by Ahmed *et al.* (1995) and Soliman (2002).

Table 5: Effect of some herbicides on chlorophyll and carotene contents (mg/g*) fresh weight of clover plants after three cuts in 2006/07 and 2007/08 seasons.

Characters	Rate (l/fed)	2006/07								
		First cut		Second cut		Third cut				
		Chlorophyll		Carotene	Chlorophyll		Carotene			
Treatments		a	B		a	b	e	a	b	ene
Butralin	2.0	1.456	0.721	0.797	1.906	0.991	1.000	1.627	0.688	1.040
Round up	0.06	1.331	0.572	0.853	1.777	0.712	1.066	1.424	0.639	1.072
Herbazed	0.06	1.236	0.559	0.948	1.576	0.446	1.066	1.327	0.534	1.155
Herphosate	0.06	1.310	0.566	0.915	1.698	0.546	1.088	1.321	0.580	1.140
Control (un-infested)	-	0.872	0.331	1.040	0.992	0.331	1.323	1.201	0.475	1.217
Control (infested)	-	1.550	0.910	0.548	1.909	1.053	0.956	1.938	0.727	0.951
LSD 5 %		0.542	0.472	0.468	0.791	0.494	0.353	0.635	0.219	0.224
		2007/08								
Butralin	2.0	1.433	0.713	0.788	1.916	0.983	1.011	1.633	0.672	1.026
Round up	0.06	1.312	0.558	0.861	1.763	0.702	1.072	1.410	0.614	1.064
Herbazed	0.06	1.214	0.551	0.969	1.581	0.456	1.079	1.332	0.551	1.152
Herphosate	0.06	1.294	0.541	0.900	1.678	0.537	1.065	1.327	0.589	1.137
Control (un-infested)	-	0.815	0.336	1.063	0.983	0.339	1.308	1.721	0.473	1.212
Control (infested)	-	1.562	0.924	0.552	1.914	1.038	0.943	1.928	0.713	0.939
LSD 5 %		0.623	0.514	0.492	0.875	0.497	0.256	0.619	0.314	0.239

mg/g= weight of chlorophyll determined by mg per gm of leaves of clover plants.

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تقييم بعض معاملات مكافحة الحشائش على مكافحة الحامول في البرسيم المصري
إبراهيم السيد سليمان
معمل بحوث الحشائش - معهد بحوث المحاصيل الحقلية - مركز البحوث الزراعية - الجيزة -
مصر

أقيمت تجربتان حقليتان في مزرعة محطة البحوث الزراعية بسخا - كفر الشيخ خلال موسمي الزراعة ٢٠٠٦/٢٠٠٧ و ٢٠٠٧/٢٠٠٨ م لدراسة تأثير بعض مبيدات الحشائش (بيوترالين - راونداب - هريازد - هيرفوست) بالإضافة إلى معاملة النقاوة اليدوية على مكافحة حشيشة الحامول ونمو نباتات ومحصول البذرة للبرسيم. أوضحت النتائج أن مبيد راونداب أظهر كفاءة عالية في مكافحة الحامول يليه مبيد هريازد وبيوترالين ثم مبيد هيرفوست.

أدت الإصابة بحشيشة الحامول إلى نقص كبير في طول النباتات - الوزن الرطب - الوزن الجاف ومحصول البذرة للبرسيم. أيضاً أوضحت النتائج أن معاملة النقاوة اليدوية بمفردها غير كافية لمكافحة الحامول ولكن يمكن استخدامها كعامل مساعد في برامج مكافحة المتكاملة للحامول.

أحدثت الإصابة بحشيشة الحامول نقص معنوي في محتوى نباتات البرسيم من كلورفيل أ و ب والبروتين وزيادة محتواها من الكاروتين.

أظهرت النتائج أيضاً أن استخدام مبيدات الحشائش في مكافحة الحامول سببت نقصاً ضعيفاً في محتوى النبات من كلورفيل أ و ب والبروتين كما سببت زيادة طفيفة في محتوى الكاروتين وذلك مقارنة بنباتات البرسيم الغير معدية والغير معاملة.

لهذا توصي هذه الدراسة بإمكانية استخدام مبيدات الحشائش (بيوترالين بمعدل ٢ لتر/فدان رش سطحي بعد الزراعة وقيل السرى أو مبيدات راونداب ، هريازد و هيرفوست بمعدل ٦٠ سم³/فدان بعد الحش بحوالي ١٥ يوم كبديل للنقاوة اليدوية لمكافحة حشيشة الحامول في البرسيم حيث أعطت مكافحة جيدة للحامول بدون أى تأثيرات ضارة على نباتات البرسيم.