

## **EFFECT OF DODDER AND SOME CONTROL METHODS FOR PRODUCTIVITY OF EGYPTIAN CLOVER CULTIVARS**

**Leilah, A. A. \*; S. E. El-Kalla\*; G. A. Ramadan\*\* and A. M. K. Abd- Rabboh\*\***

\* Agron. Dept., Fac. of Agric. Mansoura Univ.

\*\* Forage Dept. Field Crops Res. Inst., ARC Egypt

### **ABSTRACT**

Two field experiments were carried out at Sakha Experimental Station during 2007/2008 and 2008/2009 seasons to investigate the effect of dodder weed and some control methods of dodder weed on forage and seed yields of Berseem clover. The experimental design was split plot design with four replicates. Two Egyptian clover cultivars namely A<sub>1</sub>-Helaly and A<sub>2</sub>-Sakha 96 were represented in the main plot, while sub plot were divided to 4 treatments as cheek: B<sub>1</sub> clover non infested, B<sub>2</sub> clover infested by dodder seed, B<sub>3</sub> clover mixed with rye grass and B<sub>4</sub> clover mixed with barely. Treatments from B<sub>5</sub> to B<sub>10</sub> had infested by dodder seed, and treated as: B<sub>5</sub> Butralin 2 L/fed., B<sub>6</sub> Glyphosate 70 cc/fed. applied twice, B<sub>7</sub> clover and rye grass mixture (trap crop), B<sub>8</sub> clover and barely mixture (trap crop), B<sub>9</sub> false irrigation with tillage and B<sub>10</sub> false irrigation without tillage. Results could be summarized as follow: dodder weed (*Cuscuta planiflora* L.) was harmful of Egyptian clover which decreased fresh yield by 16.64 and 18.25%, dry yield by 21.04 and 22.26% and seed yield by 41.3 and 42.8% in the two seasons, respectively.

The best treatment of dodder weed control, so improve yield was false irrigation with tillage followed by Butralin herbicide 2 L/fed. and trap crop rye grass as a mixture. The effect of control methods of dodder weed of fresh yield were; false irrigation with tillage had decreased dodder weed effect by 81.6 and 79.4%, Butralin by 74.4 and 71% and trap crop rye grass by 54.7 and 58.9% in the two seasons, respectively. Using false irrigation with Butralin could be control dodder weed.

### **INTRODUCTION**

Dodder weed (*Cuscuta planiflora*) ten, is known to be the main pest attacking the Egyptian clover (*Trifolium alexandrinum*) in Egypt (Tackholm, 1965). Al Shair (1986) mentioned that *Cuscuta planiflora* decreased *Trifolium alexandrinum* fresh and dry weights at the first and the second cuts and seed yield. Dawson (1978) found that infection leads to large losses by reducing seed yield, lowering seed quality. Cudney *et al.* (1992) dodder reduce yield of forage and seed production by more than 50% of alfalfa.

Fessehaie (1992) found that the twining vines of this parasitic weed not only deprive the host plants of nutrients but also inhibit growth.

Soliman, and Abd El-Hamid (2009) found that dodder weed a great reduction in fresh weight of clover and seed yield which reached to 82.92 and 84.62% in the two seasons. False irrigation in addition to the tested herbicides caused a great significant improvement in seed yield of Egyptian clover. Soliman (2002) reported that *C. planiflora* was very sensitive to butralin and dodder seed germination did not complete. Weed control had significant increased fresh, dry and seed yield compared to control infested without treated. Zahran *et al.* (1982) found that trap crops reduction of broom rape parasitism in heavily infested soil with *O. crenata* sowing of broad bean,

Megahed (1986) found that fenugreek and coriander decreased the number of attached parasites per host plant and disturbed their development, trap crops increased faba bean yield 18 and 15%, respectively. Dawson (1987) reported that dodder is often observed coiling around grasses, but cannot form hystoria connections and will die unless a suitable host is found. Thus, growing cereals or other grass crops continuously for several years, may facilitate the exhaustion of dodder seed bank in the soil. Kharrat and Halila (1999) intercropping faba bean with fenugreek gave interesting results, it increased small seeded faba bean yield by 49%. Zemrag and Baja (2001) reported that the cultivation of trap crops is best used as part of integrated management practices. Lanini (2004) growing wheat followed by corn in a field heavily infested with *C. pentagona*, reduced the number of dodder plants infesting tomato by 90%. Thus, two years of growing a non-host crop was effective in reducing the population. Dinelli *et al.* (1993) reported that, if no suitable host is found within 3 to 5 days, the seedling of dodder will die.

Parker and Riches (1993) found that, dodder seedlings are easy to control by shallow cultivation. In addition, tillage may hasten drying the soil surface, thus preventing further dodder germination and emergence.

The aim of the present investigation was to study the effect of dodder weed and its control methods on yield of Egyptian clover.

## **MATERIALS AND METHODS**

Field experiments were conducted at Sakha Agricultural Research Station during two successive seasons 2007/2008 and 2008/2009, to study the effect of dodder weed and its control methods on yield (fresh, dry and seed) of Egyptian clover cultivars. Dodder seeds were mixed with soil at 5% of clover seed (w/w). Sowing dates were October 10<sup>th</sup> and September 29<sup>th</sup> in the two seasons, respectively. Split plot design was used with four replications. The main plots were assigned to Egyptian clover cultivars. Meanwhile, control methods of dodder were randomly distributed at the sub plots. The plot area was 6 m<sup>2</sup>.

- a. The main plots; Egyptian clover cultivars:
  - A<sub>1</sub> Helaly-A<sub>2</sub> Sakha 96 promising population from Khadrawi land race.
- b. Sub-plots, control methods of dodder.

B <sub>1</sub>	Berseem or (clover) non-infested (healthy plants)	Control
B <sub>2</sub>	Berseem or (clover) infested by dodder seed	Control.
B <sub>3</sub>	Berseem and rye grass mixtures (non-infested)	Control.
B <sub>4</sub>	Berseem and barley mixtures (non-infested)	Control.
B <sub>5</sub>	Berseem infested and using butralin (Amex) 48% EC at 2 L/fed. pre-planting surface application (after sowing and before irrigation).	
B <sub>6</sub>	Berseem infested and using glyphosate (Round up) 48% WSC at 70 cc/fed. applied twice, where the first one was applied 35 days after sowing and the second applied one week after the first cutting.	
B <sub>7</sub>	Berseem and rye grass mixture (infested)	Trap crop.
B <sub>8</sub>	Berseem and barley mixture (infested)	Trap crop.

B<sub>9</sub> Berseem sowing after infested plot, false irrigation and tillage (20 days).

B<sub>10</sub> Berseem sowing after infested plot, false irrigation without tillage (20 days).

Seeds were broadcast in plots with seeding rate of 20 kg/fed. the preceding crop was wheat. Four cuts were harvested and seed yield throughout the growing season at each season. The characters study of yield as follow:

1. Fresh yield, it was determined by cutting plot (6 m<sup>2</sup>) and weight it in kg/plot without dodder and transformed to ton per feddan.
2. Dry yield; it was determined by dried fresh weight sample (oven 105°C), and determined dry matter percentage, so recorded dry yield by kg/plot and converted to, ton/fed.
3. Seed yield; it was determined by harvested every plot at maturity seed stage and weight good seed only g/plot and transformed to seed yield kg/fed.

**Statistical analysis:**

The collected data were subjected to proper statistical analysis of split-plot design and randomize complete design according to procedure outlined by Snedecor and Cochran (1967). Means were compared at 0.05 and 0.01 level of significant by the least significant different (L.S.D.) test. All statistical analysis was performed by using analysis of variance of (IRRISTAT) and (MSTAT) computer software package.

## **RESULTS AND DISCUSSION**

### **1.Effect of dodder weed and its control methods on fresh yield ton/fed. of Egyptian clover cultivars:**

Mean fresh yield ton/fed. of Egyptian clover cultivars as affected by dodder weed and some control methods of dodder in the 4 cuts and total yield in 2007/2008 and 2008/2009 seasons, are presented in Table 1. Concerning the effect of dodder and its control methods on fresh yield, results clearly indicated that insignificant different between Helaly and Sakha 96 cultivars of fresh yield in the two seasons, except at the first and the second cuts in the first season.

Data in Table 1 indicated that highly significant different between treatments in the 4 cuts and total fresh yield in the two seasons. The four treatments as check B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> and B<sub>4</sub> had highly significant different, the highest one B<sub>3</sub> mixtures of rye grass followed by mixtures of barely in the first season, while B<sub>2</sub> clover infested had the highly significant lowest one of fresh yield ton/fed. It is due to mixture had good productivity, but the harmful of dodder clearly effect on fresh yield, where healthy plants B<sub>1</sub> exceeded plants infested B<sub>2</sub> by 11.54 and 12.01 ton/fed. of fresh yield as a total yield Soliman and Abd El-Hamid (2009). Effect of herbicides B<sub>5</sub> (Butralin) and B<sub>6</sub> (Glyphosate) had significant decreased total fresh yield compared to healthy plants B<sub>1</sub> in the two seasons, indicated the herbicides did not complete control dodder weed.

**Table 1: Mean of fresh yield ton/fed. of Egyptian clover cultivars as affected by dodder weed and some control methods of dodder in the 4 cuts and total yield in 2007/2008 and 2008/2009, seasons.**

Treatments	Fresh yield ton/fed.										
	2007/2008					2008/2009					
	1 <sup>st</sup> cut	2 <sup>nd</sup> cut	3 <sup>rd</sup> cut	4 <sup>th</sup> cut	Total yield	1 <sup>st</sup> cut	2 <sup>nd</sup> cut	3 <sup>rd</sup> cut	4 <sup>th</sup> cut	Total yield	
<b>Main tr.</b>											
Egypt.A <sub>1</sub> Helaly cvs.	13.06	17.29	19.24	17.86	67.45	14.35	15.57	17.06	15.22	62.19	
CloverA <sub>2</sub> Sakha 96 p.	14.49	16.49	18.61	17.39	66.98	14.72	15.67	17.33	15.63	63.34	
Sign.	*	*	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	
<b>Sub. tr.</b>											
Control treat.	B <sub>1</sub> clover	13.83	17.22	19.57	18.74	69.36	14.63	16.17	18.25	16.75	65.80
	B <sub>2</sub> clover infest.	11.03	15.12	17.04	14.63	57.82	11.83	13.59	15.51	12.86	53.79
	B <sub>3</sub> mix. rye grass	14.60	18.83	20.72	20.33	74.48	15.61	17.50	19.04	17.12	69.27
	B <sub>4</sub> mix. barley	15.54	17.59	19.67	18.01	70.81	16.24	15.89	16.87	15.75	64.75
Herbic	B <sub>5</sub> C. infest + Butralin	13.55	16.62	18.67	17.56	66.40	14.21	15.51	17.24	15.36	62.32
	B <sub>6</sub> C. infest + Glyphosate	13.16	16.35	18.15	16.90	64.56	13.95	15.19	16.87	15.02	61.03
Mixture infest.	B <sub>7</sub> C. + rye grass infest	14.09	17.23	19.28	18.53	69.13	14.88	16.43	17.69	15.59	64.59
	B <sub>8</sub> C. + barley infest	15.02	16.26	18.23	16.19	65.70	15.59	14.68	15.45	14.39	60.11
False irrig.	B <sub>9</sub> C. infest with tillage	13.49	16.90	19.05	17.80	67.24	14.23	15.70	17.61	15.79	63.33
	B <sub>10</sub> C. infest without tillage	13.42	16.79	18.87	17.57	66.65	14.15	15.56	17.36	15.61	62.68
Sign.		**	**	**	**	**	**	**	**	**	
L.S.D. 0.05		0.59	1.05	1.10	0.84	1.35	1.06	0.71	1.18	0.64	2.39
L.S.D. 0.01		0.78	1.39	1.45	1.11	1.78	1.40	0.94	1.56	0.85	3.16
Interaction		N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	

\*, \*\* significant at 0.05 and 0.01 level of probability

C: Clover = Egyptian clover

Infest.: Infested by *Cuscuta planiflora*

While, two herbicides had highly significant exceeded check B<sub>2</sub> infested by 8.58 and 8.53 ton/fed. for butralin by 6.74 and 7.24 ton/fed. in the two seasons respectively, for for glyphosate and indicated butralin more effective than glyphosate. Soliman and Abd El-Hamid (2009). The effect of mixtures or trap crops on dodder weed, results in Table 1 showed that B<sub>7</sub> mixtures of rye grass significant exceeded B<sub>8</sub> mixtures of barely of total fresh yield in the two seasons, where B<sub>7</sub> had 69.13 and 64.55 ton/fed. total fresh yield in the two seasons, respectively while B<sub>8</sub> had 65.70 and 60.11 ton/fed. as total fresh yield in the two seasons, respectively. it is due to barely had only one cut and the second had moderate, while ray grass had regrowth through the 4 cuts.

The mixtures check (non infested) B<sub>3</sub> and B<sub>4</sub> had highly significant exceeded mixtures infested B<sub>7</sub> and B<sub>8</sub> of total fresh yield. Where B<sub>3</sub> exceeded B<sub>7</sub> by 5.35 and 4.68 ton/fed. in the two seasons, respectively, also B<sub>4</sub> exceeded B<sub>8</sub> by 5.11 and 4.64 ton/fed. of total fresh yield in the two seasons; indicated that the effect of dodder weed on mixtures. While trap crops had effect on dodder weed and decreased the harmful of dodder, example of these results. The differences between B<sub>3</sub> and B<sub>1</sub> in the total fresh yield in the first season was 5.12 ton/fed. it is due to mixture (rye grass), and the differences between B<sub>7</sub> and B<sub>2</sub> was 11.31 ton/fed. it is due to mixture (rye grass) and the effect of trap crops on dodder weed which was 6.19 ton/fed. The effect of trap crops, rye grass and barely on dodder weed moderate

different for herbicides, but trap crops better than herbicides caused to mixtures better than clover alone. Where mixtures had good palatability, nutrients balanced and more production, also it is natural method. Dawson (1987) and Lanini (2004).

The false irrigation B<sub>9</sub> and B<sub>10</sub> had insignificant different of fresh yield in the two seasons. While check B<sub>1</sub> non-infested had significant exceeded B<sub>9</sub> in the two seasons, respectively. Where exceeded by 2.12 and 2.47 ton/fed. as a total yield in the two seasons, respectively, but B<sub>9</sub> had highly significant exceeded check B<sub>2</sub> infested in the two seasons by 9.42 and 9.54 ton/fed. as a total yield, respectively, indicated the effect of false irrigation with tillage of dodder weed consider highly effect of decreased dodder weed, Parker and Riches (1993) and Soliman and Abd El-Hamid (2009). B<sub>9</sub> had insignificant different for herbicides of fresh yield in the two seasons, except B<sub>9</sub> had insignificant exceeded B<sub>6</sub> (Glyphosate) in the first season.

B<sub>1</sub> had highly significant exceeded B<sub>10</sub> in the two seasons by 2.71 and 3.12 ton/fed. of total fresh yield, while B<sub>10</sub> had highly significant exceeded check B<sub>2</sub> by 8.83 and 8.89 ton/fed. of total fresh yield in the two seasons, respectively. B<sub>10</sub> had insignificant different for B<sub>5</sub> (Butralin) in the two seasons, while B<sub>10</sub> had significant exceeded B<sub>6</sub> in the first season, and insignificant different in the second seasons of total fresh yield. False irrigation had the best treatments of control dodder weed.

## **2.Effect of dodder weed and some control methods of dodder on dry yield ton/fed. of Egyptian clover cultivars:**

Mean dry yield ton/fed. of Egyptian clover cultivars as affected by dodder weed and some control methods of dodder in the 4 cuts and total dry yield in 2007/2008 and 2008/2009 seasons, are presented in Table 2. Data asseverated clearly that the two cultivars had insignificant different of dry yield in the 4 cuts and total dry yield in the two seasons, except the second cut in the first season. Where Helaly exceeded significantly for Sakha 96. Also, data indicated clearly that treatments had highly significant different in the 4 cuts and total dry yield in the two seasons it is due to effect of dodder weed and treated on dry yield.

The 4 check, B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> and B<sub>4</sub> had significant different of dry yield, where B<sub>3</sub> had the highest dry yield in the two seasons. Where B<sub>3</sub> had highly significant exceeded the other check for most cuts and total dry yield, except the first cut B<sub>4</sub> exceeded B<sub>3</sub> it is due to barely in mixture which produced dry yield more than rye grass. Also B<sub>3</sub> exceeded the other treatments of total dry yield due to rye grass which regrowth through the 4 cuts. The check B<sub>1</sub> healthy plants had significant decreased dry yield compare to mixture B<sub>3</sub> and insignificant different for mixture B<sub>4</sub>, While highly significant exceeded check B<sub>2</sub> infested in the 4 cuts and total dry yield in the two seasons, respectively, indicated the effect of dodder weed on dry yield, Fessehaie (1992), Soliman (2002), Soliman and Abd El-Hamid (2009), B<sub>1</sub> exceeded for B<sub>2</sub> by 1.94 and 1.87 ton/fed. dry yield in the two seasons, respectively it is due to the harmful of dodder. Data also showed that the dry yield increased by cuttings and dodder effect were the highest in the fourth cut due to improve on the weather. Also the effect of dodder on dry yield more than the effect on fresh

yield, where reduction percentages of fresh yield were 16.64 and 18.25% while of dry yield were 21.04 and 22.26%, in the two seasons, respectively from Table 1 and 2 of B<sub>1</sub> and B<sub>2</sub>.

**Table 2: Mean of dry yield ton/fed. of Egyptian clover cultivars as affected by dodder weed and some control methods of dodder in the 4 cuts and total yield in 2007/2008 and 2008/2009, seasons.**

Treatments		Dry yield ton/fed.									
		2007/2008					2008/2009				
		1 <sup>st</sup> cut	2 <sup>nd</sup> cut	3 <sup>rd</sup> cut	4 <sup>th</sup> cut	Total yield	1 <sup>st</sup> cut	2 <sup>nd</sup> cut	3 <sup>rd</sup> cut	4 <sup>th</sup> cut	Total yield
<b>Main tr.</b>											
Egypt.A <sub>1</sub> Helaly cvs.		1.28	2.04	2.48	3.12	8.92	1.41	1.79	2.37	2.36	7.93
CloverA <sub>2</sub> Sakha 96 p.		1.35	1.88	2.32	3.06	8.61	1.39	1.68	2.41	2.33	7.81
Sign.		N.S	*	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S
<b>Sub. tr.</b>											
Control treat.	B <sub>1</sub> clover	1.31	2.01	2.52	3.38	9.22	1.43	1.80	2.59	2.58	8.40
	B <sub>2</sub> clover infest.	1.03	1.71	2.09	2.45	7.28	1.19	1.51	2.03	1.80	6.53
	B <sub>3</sub> mix. rye grass	1.43	2.22	2.70	3.67	10.02	1.53	1.98	2.60	2.75	8.86
	B <sub>4</sub> mix. barley	1.61	2.05	2.50	3.28	9.44	1.62	1.86	2.44	2.42	8.34
Herbic	B <sub>5</sub> C. infest + Butralin	1.24	1.90	2.34	2.96	8.44	1.33	1.68	2.39	2.34	7.74
	B <sub>6</sub> C. infest + Glyphosate	1.20	1.97	2.28	2.88	8.33	1.29	1.64	2.34	2.25	7.52
Mixture infest.	B <sub>3</sub> C. + rye grass infest	1.33	2.05	2.50	3.26	9.14	1.41	1.84	2.41	2.51	8.17
	B <sub>3</sub> C. + barley infest	1.51	1.86	2.29	2.83	8.49	1.51	1.66	2.34	2.14	7.65
False irrig.	B <sub>3</sub> C. infest with tillage	1.24	1.93	2.44	3.11	8.72	1.35	1.71	2.45	2.36	7.87
	B <sub>0</sub> C. infest without tillage	1.23	1.92	2.36	3.04	8.55	1.33	1.70	2.28	2.29	7.60
Sig.		**	**	**	**	**	**	**	**	**	**
L.S.D. 0.05		0.11	0.16	0.14	0.12	0.23	0.09	0.08	0.22	0.04	0.27
L.S.D. 0.01		0.15	0.21	0.19	0.16	0.30	0.12	0.11	0.29	0.05	0.36
Interaction		N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S	N.S

\*, \*\* significant at 0.05 and 0.01 level of probability

C: Clover = Egyptian clover

Infest. : Infested by *Cuscuta planiflora*

The effect of herbicides B<sub>5</sub> and B<sub>6</sub> on control dodder, data indicated that insignificant different between B<sub>5</sub> butralin and B<sub>6</sub> glyphosate of dry yield in the 4 cuts and total yield in the two seasons, except the fourth cut in the second season, where B<sub>5</sub> significantly exceeded B<sub>6</sub> of dry yield. B<sub>1</sub> healthy plants had highly significant exceeded B<sub>5</sub> of dry yield in the 4 cuts and total dry yield in the two seasons, by 0.78 and 0.66 ton/fed. as a total dry yield in the two seasons, respectively while B<sub>5</sub> had highly significant exceeded B<sub>2</sub> (clover infested) of dry yield in the two seasons by 1.16 and 1.21 ton/fed. indicated the harmful of dodder on dry yield of clover and the effect of butralin on dodder weed of Egyptian clover. Soliman (2002) found that *C. planiflora* was very sensitive to butralin at the rate of 2.5 L/fed. (either soil incorporated or surface applied), its reduced the fresh weight of dodder by 98 and 97%, respectively B<sub>6</sub> (Glyphosate) had highly significant decreased dry yield of Egyptian clover compared to B<sub>1</sub> healthy plants in the two seasons, where B<sub>1</sub> exceeded on B<sub>6</sub> by 0.89 and 0.88 ton/fed. in the two seasons, respectively, while B<sub>6</sub> had highly significant exceeded for B<sub>2</sub> (infested without treated) of dry yield in the two seasons by 1.05 and 0.99 ton/fed., respectively, indicated the effect of dodder and the effect of glyphosate on dodder weed. In general

Butralin better than Glyphosate on the effect of dodder weed, and the herbicides using before sowing irrigation had less harmful than that using after emergence. The effect of trap crops B<sub>7</sub> and B<sub>8</sub> (mixtures infested) on dry yield of Egyptian clover, data in Table 2 asseverated clearly that B<sub>7</sub> (mixtures, rye grass) had highly significant exceeded B<sub>8</sub> (mixtures barely) of total dry yield in the two seasons, except B<sub>8</sub> in the first cut in the two seasons exceeded on B<sub>7</sub>. B<sub>3</sub> (mixtures rye grass non-infested) had highly significant exceeded B<sub>7</sub> of total dry yield in the two seasons by 0.88 and 0.69 ton/fed. respectively, it is due to effect of dodder weed, also the differences between B<sub>1</sub> and B<sub>3</sub> were 0.8 and 0.46 ton/fed. of total dry yield in the two seasons, respectively, it is due to mixtures, while B<sub>7</sub> had highly significant exceeded for B<sub>2</sub> in the 4 cuts and total dry yield in the two seasons by 1.86 and 1.64 ton/fed., respectively, it is due to mixtures and the effect of trap crop, so the effect of trap crop on dodder weed and increased dry yield by 1.06 and 1.18 ton/fed. of total dry yield, which near to the effect of herbicides on dodder weed and increased dry yield. Also, B<sub>4</sub> (check mixtures barely non-infested) had highly significant exceeded B<sub>8</sub> of total dry yield in the two seasons by 0.95 and 0.69 ton/fed., respectively, while B<sub>8</sub> had highly significant exceeded b<sub>2</sub> of total dry yield in the two seasons by 1.21 and 1.12 ton/fed., respectively, and the effect of trap crop (barely) were 0.99 ad 1.18 ton/fed. of total dry yield in the two seasons, respectively, as affect on dodder weed and increased total dry yield. Zahrarn *et al.* (1982), Megahed (1986), Kharratand Halila (1999), Zemrag (2001), Dawson (1987) and Lanini (2004).

The effect of false irrigation B<sub>9</sub> and B<sub>10</sub> as shown in Table (2) data revealed that B<sub>9</sub> and B<sub>10</sub> had significant different of total dry yield in the two seasons. B<sub>1</sub> healthy plants had highly significant exceeded B<sub>9</sub> of total dry yield of Egyptian clover in the two seasons by 0.50 and 0.53 ton/fed., respectively. While B<sub>9</sub> had highly significant exceeded for B<sub>2</sub> of total dry yield in the two seasons by 1.44 and 1.34 ton/fed., respectively, indicated that the effect of false irrigation with tillage on dodder weed and increased dry yield of Egyptian clover compared to check infested without treated. Also, B<sub>9</sub> had significant exceeded for B<sub>5</sub> of total dry yield in the first season and insignificant in the second season, while B<sub>9</sub> had significant exceeded for B<sub>6</sub> of total dry yield in the two seasons, indicated B<sub>9</sub> was the best treatment of control dodder and caused of increased dry yield of Egyptian clover, Khalaf *et al.* (1996), Dinelli *et al.* (1993) and Soliman (2002). B<sub>1</sub> had highly significant exceeded for B<sub>10</sub> of dry yield in the two seasons by 0.67 and 0.8 ton/fed. as total yield, respectively, as affected by dodder weed. But B<sub>10</sub> had highly significant exceeded for B<sub>2</sub> (check) of total dry yield in the two seasons, respectively, by 1.27 and 1.07 ton/fed. it is due to the effect of false irrigation without tillage on dodder weed and increased dry yield. Also, B<sub>10</sub> had significant different for herbicides, butralin and glyphosate of dry yield and dodder control of Egyptian clover in the two seasons.

### **3.Effect of dodder weed and some control methods of dodder on seed yield kg/fed. of Egyptian clover cultivars:**

Means of seed yield kg/fed. of Egyptian clover cultivars as affected by dodder weed and some control methods of dodder in the two seasons are

presented in Table (3). Data revealed that Helaly cultivars exceeded on Sakha 96 cultivar of seed yield kg/fed. in the two seasons, while the exceeded was highly significant in the first season, and the second season was insignificant. Also, data in Table (3) asseverated clearly that highly significant different of seed yield between the treatments in the two seasons. The check treatments, B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub> and B<sub>4</sub> were highly significant different of seed yield kg/fed. in the two seasons, due to the different effect of treatments on dodder weed. Where B<sub>1</sub> (healthy plants) had the highest seed yield 529.3 and 408.5 kg/fed. in the two seasons, respectively, and significant exceeded for B<sub>3</sub> and B<sub>4</sub> in the two seasons, caused to mixtures and competition between two crops, while B<sub>1</sub>, B<sub>3</sub> and B<sub>4</sub> had highly significant exceeded for B<sub>2</sub> of seed yield kg/fed. in the two seasons by (218.8 and 174.7 kg/fed.), (139.8 and 116.7 kg/fed.) and (122.3 and 99.2 kg/fed.) in the two seasons, respectively. The results indicated that the highest effect of dodder weed was on seed yield followed by dry yield and the last green yield.

**Table 3: Mean seed yield kg/fed. of Egyptian clover cultivars as affected by dodder weed and some control methods of dodder in 2007/2008 and 2008/2009, seasons.**

Treatments		Seed yield kg/fed.	
		2007/2008	2008/2009
<b>Main tr.</b>			
Egypt.	A <sub>1</sub> Helaly cvs.	447.0	343.6
Clover	A <sub>2</sub> Sakha 96 p.	389.2	301.1
Sign.		**	N.S
<b>Sub. tr.</b>			
Control treat.	B <sub>1</sub> clover	529.3	408.5
	B <sub>2</sub> clover infest.	310.5	233.8
	B <sub>3</sub> mix. rye grass	450.3	350.5
	B <sub>4</sub> mix. barley	432.8	333.0
Herbic	B <sub>5</sub> C. infest + Butralin	396.5	312.5
	B <sub>6</sub> C. infest + Glyphosate	387.5	294.0
Mixture infest.	B <sub>7</sub> C. + rye grass infest	391.0	291.0
	B <sub>8</sub> C. + barely infest	352.8	275.5
False irrig.	B <sub>9</sub> C. infest with tillage	473.0	367.0
	B <sub>10</sub> C. infest without tillage	457.6	357.5
Sign.		**	**
L.S.D. 0.05		50.4	35.7
L.S.D. 0.01		66.6	47.2
Interaction		N.S	N.S

\*, \*\* significant at 0.05 and 0.01 level of probability

C: Clover = Egyptian clover

Infest.: Infested by *Cuscuta planiflora*

For fresh yield the differences between B<sub>1</sub> and B<sub>2</sub> due to dodder harmful were (16.64 and 18.25%) for dry yield (21.04 and 22.26%) and for seed yield (41.3 and 42.8%) as reduction percentages of yield in the two seasons, respectively. Dawson (1978), Cudney *et al.* (1992) and Soliman and Abd El-Hamid (2009).



The effect of herbicides on dodder and seed yield, data in Table (3), revealed that insignificant different between the two herbicides B<sub>5</sub> Butralin and B<sub>6</sub> Glyphosate of seed yield in the two seasons. While, healthy plants B<sub>1</sub> had highly significant exceeded for B<sub>5</sub> and B<sub>6</sub> of seed yield in the two seasons by 132.8 and 96 kg/fed., respectively for B<sub>5</sub> and by 141.8 and 114.5 kg/fed. for B<sub>6</sub>, due to the effect of treatments. But B<sub>5</sub> and B<sub>6</sub> had highly significant exceeded B<sub>2</sub> on seed yield in the two seasons by 86 and 78.7 kg/fed. and by 77 and 60.2 kg/fed. for B<sub>5</sub> and B<sub>6</sub> in the two seasons, respectively. The effect of trap crops B<sub>7</sub> and B<sub>8</sub> on seed yield, data indicated that insignificant different between two treatments. The check B<sub>3</sub> had significant exceeded B<sub>7</sub> of seed yield caused to the effect of dodder weed in the two seasons, while B<sub>7</sub> had significant exceeded for B<sub>2</sub> of seed yield in the two seasons by 80.5 and 57.2 kg/fed., respectively, it is due to the effect of trap crops on dodder weed and increased seed yield. Also, check B<sub>4</sub> significant exceeded for B<sub>8</sub> of seed yield in the two seasons. While B<sub>8</sub> had exceeded for B<sub>2</sub> in the two season of seed yield but it was significant in the second season and significant in the first season.

The effect of false irrigation B<sub>9</sub> and B<sub>10</sub> of dodder weed and relation for seed yield, data revealed that insignificant different between the two treatments of seed yield in the two seasons, while (healthy plants) B<sub>1</sub> had significant exceeded for B<sub>9</sub> and B<sub>10</sub> of seed yield in the two seasons, by 56.3 and 41.5 kg/fed. for B<sub>9</sub> and by 71.7 and 51 kg/fed. for B<sub>10</sub> in the two seasons, respectively. B<sub>9</sub> and B<sub>10</sub> had highly significant exceeded on B<sub>2</sub> in the two seasons of seed yield by 162.5 and 133.2 kg/fed. for B<sub>9</sub> and by 147.1 and 123.7 kg/fed. for B<sub>10</sub>, respectively. It is due to the effect of false irrigation on dodder weed, so, increased seed yield. The results indicated that false irrigation was the best treatment of control dodder weed and increased yield compared to the other control methods of dodder (herbicides and trap crops). Soliman and Abd El-Hamid (2009).

## REFERENCES

- Al Shair, S.A. (1986). Effect of dodder *Cuscuta* spp. on some Egyptian crops. Alex. J. Agric. Res. 31(2): 481.
- Cudney, D.W.; S.B. Orloff and J.S. Reints (1992). An integrated weed managment for the control of dodder (*Cuscuta indecora*) in alfalfa (*Medicago sativa*). Weed Technol. 6: 603-606.
- Dawson, J.H. (1978). Control of dodder *Cuscuta* spp. with pronamide. Weed Science, 26: 660-664.
- Dawson, J.H. (1987). *Cuscuta* (convolvulaceae) and its control. p. 137-149. In: Proc. 4<sup>th</sup> Internat. Sym. Parasitics Flowering Plants, Germany.
- Dinelli, G.A. Bonetti and E. Tibiletti (1993). Photosynthetic and accessory pigments in *Cuscuta campestris* Yuncker and some host species. Weed Rev. Res. 33: 253-260.
- Fessehaie, R. (1992). Review of *Cuscuta* spp. problems and control. Ethiopian Weed Science, Committee, 67-78.

- Khalaf, K.A.; R.R. El-Masry and N. Missiha (1996). The effect of soil treatment with Basamid (dazomet) on *Orobanche crenata* and *Cuscuta planiflora*. Egyptian. J. of Physiological Sci. 20: 71-79.
- Kharrat, M. and M.H. Halila (1999). Evaluation d'autres moyens de lutte control *Orbanche foetide* Poir. *Surficia faba* L. pages 259-264. in Advances in Prasitic Weed Control at On-Farm Leve. Joint Action to Control Orobanche in the WANA region. vol. 11 (Kroschel J., Abdel Rabibhi M., Betz H., eds.) du 30 Mars au 2 avril 1998 proceeding de l'atelier tenua Rabat, Morac.
- Lanini, W.T. (2004). Economical methods of controlling dodder in tomatoes. Proc. Calif. Weed, Sci. Soc. 56: 57-59.
- Megahed, M.A. (1986). Responses of some faba bean cultivars to phosphorus fertilization and broomrape control methods. M.S. Thesis, Fac. Agric., Cairo Univ. Egypt.
- Parker, C. and C.R. Riches (1993). Parasitic weeds of the world. Biology and Control. CAB International, Wallingford, UK. 304 pp.
- Snedecor, G.W. and W.G. Cochran (1967). Statistical methods. 6<sup>th</sup> Ed., Iowa State Univ. Press . Ames., USA: 325-330.
- Soliman, I.E. and M.M. Abd El-Hamid (2009). Effect of sowing methods and some weed control treatments on dodder control in clover. crop. J. Agric. Sci. Mansoura Univ., 34(4): 3211-3221.
- Soliman, I.E.I. (2002). Herbicidal cavity evaluation of some herbicides used to control of dodder *Cuscuta* spp. in some field crops. Ph.D. Thesis, Fac. of Agric. Mansoura, Univ.
- Tackholm, V. (1965). Student flora of Egypt. 1<sup>st</sup> ed. Anglo-Egyptian Bookshop. Cairo, pp. 888.
- Zahran, M.K.; Ibrahim, F.H. Farrag and M.A. Kirolos (1982). Investigation in broom rape control in broad beans. J. Agric. Res. Tanta Univ. 6(1): 266-276.
- Zemrag, A. and M. Baja (2001). Characterization of *Orbanche* spp. in morocco and the effect of some trap crops on *Orobanche crenata*. Forsk, in faba bean (*Vicia faba* L.). 7<sup>th</sup> Inter. Parasitic Weed Sump. Nantes France, 300.

تأثير الحامول وبعض طرق مقاومته على إنتاجية البرسيم المصرى  
عبد الرحيم عبد الرحيم ليله\* ، سمير السيد القلا\* ، جمال على على رمضان\*\* و عاصم  
محمد قاسم عبد ربه\*\*  
\* كلية الزراعة - جامعة المنصورة  
\*\* قسم بحوث العلف - محطة البحوث الزراعية بسخا - مركز البحوث الزراعية

اجريت التجارب الحقلية بمزرعة محطة البحوث الزراعية بسخا موسمى ٢٠٠٧/٢٠٠٨ و  
٢٠٠٨/٢٠٠٩ لدراسة تأثير الحامول وبعض طرق مقاومته على إنتاجية البرسيم المصرى ، حيث  
استخدم صنفين من البرسيم المصرى أ١- هلالى و أ٢- سخا ٩٦ ومعاملات المقاومة هي كالتالى:  
• ٤ معاملات كتنترول للمقارنة ب١ برسيم بدون عدوى ، ب٢- برسيم معدى ببذور الحامول ، ب٣-  
مخلوط البرسيم والراى جراس بدون عدوى و ب٤- مخلوط البرسيم والشعير بدون عدوى.

- ٢ معاملة مييدات ب٥- برسيم معدى مع استخدام البيوترالين و ب٦- برسيم معدى مع استخدام الجليفوسيت.
  - ٢ معاملة محاصيل صياده ب٧- برسيم مخلوط مع الري جراس مع العدوى و ب٨- برسيم مخلوط مع الشعير مع العدوى ، ب٩- عدوى وريه كدابه وخربشة والزراعة بعد ٢٠ يوم و ب١٠- عدوى ريه كدابه بدون خربشة والزراعة بعد ٢٠ يوم.
- صممت التجربة فى قطع منشقة مره واحده فى اربعة مكررات حيث وزعت الاصناف فى القطع الرئيسية ووزعت معاملات مقاومة الحامول عشوائيا فى القطع المنشقة - تم اخذ اربعة حشاشات للعلف الاخضر وتقدير المحصول الجاف وتركنت الحشه الخامسة لانتاج البذرة ، واوضحت النتائج الاتى:
- عدم وجود فروق معنوية بين صنفى البرسيم المصرى أ١- هلالى و أ٢- سخا ٩٦ وان تفوق الهلالى على سخا ٩٦ . الحامول حشيشة متطفله ضارة بالبرسيم المصرى حيث ادت الى نقص فى المحصول الاخضر والجاف والبذرة فى الموسمين كما يلى: نقص المحصول الاخضر بنسبة ١٦.٦٤ ، ١٨.٢٥ % والمحصول الجاف بنسبة ٢١.٠٤ ، ٢٢.٢٦ % وفى محصول البذرة بنسبة ٤١.٣ ، ٤٢.٨ % فى الموسمين على التوالى حيث يلاحظ تدرج الضرر ليكون اعلاها فى محصول البذرة.
- وكانت افضل المعاملات فى مقاومة الحامول وتحسين انتاجية البرسيم المصرى هى الريه الكدابه مع الخربشة ثم استخدام مبيد بيوترالين ثم المحاصيل الصياده الري جراس كمخلوط مع البرسيم حيث ان الريه الكدابه مع الخربشة قاومت الحامول بنسبة ٨١.٦ ، ٧٩.٤ % ثم البيوترالين بنسبة ٧٤.٤ ، ٧١ % ثم الراى جراس كمحصول صياد للحامول بنسبة ٥٤.٧ ، ٥٨.٩ % فى الموسمين على التوالى لصفه المحصول الاخضر الكلى.
- ولذلك فان الريه الكدابه مع الخربشة اعطت اعلى نسبة مقاومة للحامول واقل نسبه نقص فى المحصول عن المقارنة.
- وانه فى حاله استخدام الريه الكدابه مع استخدام البيوترالين يمكن مقاومة الحامول بنسبة كبيرة.

#### قام بتحكيم البحث

أ. د/ سعد أحمد المرسى

أ. د/ فاروق متولى على

كلية الزراعة – جامعة المنصورة

مركز البحوث الزراعية