STUDY REGARDING THE EFFECTIVENESS OF INSECTICIDES IN BIRD´S – FOOT TREFOIL THRIPS (*ODONTOTHRIPS LOTI* HAL.) CONTROL IN WESTERN ROMANIA CONDITIONS

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Abstract. *At the bird's – foot trefoil crop one of the most important aspects is the production of seed, so for the realisation of an integrated protection of a superior quality seed and in a great quantity, is necessary to know the insects that produce the most important damages to this crop. One of these insects is the bird's – foot trefoil thrips (Odontothrips loti Hal.). The weather conditions during the last two years were favorable to the growth of the Odontothrips loti Hal. populations in the western part of Romania (Timis County). The purpose of this research was to test some insecticides used for controlling the seed Lotus corniculatus thrips in soil and climatic condition from Didactical Station of U.S.A.M.V.B. Timisoara. In this paper we try to draw attention to this pest which is of real importance in case of seed leguminous plants production. For realizing the chemical treatments in the years 2009 and 2010, the experimental field was placed at S.D. Timişoara. The experimental field was formed from 3 repetitions, each repetition having 7 variants. The usage of pesticides was the same in the all two years of the experimentation, as follows: V_1 – treated with Fastac 10 EC; V_2 - treated with Mospilan 20 SP; V_3 - treated with Calypso 480 SC; V_4 - treated with Confidor 70 WG; V_5 - treated with Actellic 50 EC; V_6 - treated with Decis 2,5 EC; V_7 – untreated testifier. In the year 2009 the most efficient product in controlling the bird's – foot trefoil thrips is the Fastac 10 EC product, which had an efficiency coeficient of 69,88% and the lowest results were obtained after the usage of Mospilan 20 SP product, with an efficiency coeficient, it was of 60,93%. In the year 2010 the best results were obtained after the usage of same product Fastac 10 EC, which had an efficiency coeficient of 76,48%, and the lowest results were obtained after the usage of Mospilan 20 SP product, with an efficiency coeficient of 62,61%. The knowledge of the treatments warning is essential in the establishment of the Odontothrips loti optimum control moments.*

Key words**:** *insecticides, bird´s – foot trefoil thrips, control*

INTRODUCTION

The *Lotus corniculatus* importance as a green crop consists in the fact that it could change the lucerne and clover from some of the regions fewer auspicious of the crop. From this point of view, the opinion of many explorers is unanimous, so that the *Lotus corniculatus* is a leguminous with the greatest adaptability at the distinct weather conditions and soil: drought, high humidity, acid or superficial soils, salts or with a low fertility, stubbed fields etc (DRAGOMIR, 1981; WINCH ŞI MACDONALD, 1961, LASKEY ŞI WAKEFIELD, 1978; DIONNE, 1969, VARGA, 1998).

The *Lotus corniculatus* has a great capability of autoinsemination, even in the conditions of a depasturage of a long time. Concurrently, the rusticity assures great qualities to the *Lotus corniculatus*, comparative with the other leguminouses such as, the lack of meteorisations production during the consumption under green table shape (ZAMFIRESCU, 1965).

In the conditions of our country, the productions of bird's – foot trefoil seed are in

generally, reduced, especially in the aroughty regions. Besides the insurance of favourable development conditions, at the production of bird's – foot trefoil seed, it is important also the behaviour of that plant to the pests and diseases attack.

One of the most important pests is the bird's – foot trefoil thrips (*Odontothrips loti* Hal.), which produces damage of 80% from the total production (KNECHTEL, 1951, 1961; VASILIU, 1971; LEWIS, 1973; LACASA PLASENCIA A., 1996; BADEA, 2005).

The paper purpose is to bring contributions to the characteristics knowledge of the produced attack of *Odontothrips loti* Hal. on *Lotus corniculatus* plants and the testing of some insecticides used for controlling the seed *Lotus corniculatus* thrips.

Thrugh realizing those objectives is fallowed the ensurance of an efficient protection of the *Lotus corniculatus* crop in obtaining a seed production of superior quality and a great quantity.

MATERIAL AND METHODS

For the insecticides efficaciousness analysing in the year 2009 and 2010, the experimental field was placed at Didactical Station Timişoara. The experimental field was placed after the randomized block method (CIULCĂ, 2002), in 3 variantes and 7 repetitions, the lot sizes being: 12 m length, 2 m width, with a distance between repetitions of 2 m, and between the variants of 0,25 m, the total area of experimental field for pesticides analysing, being of 800 m^2 (figure 1).

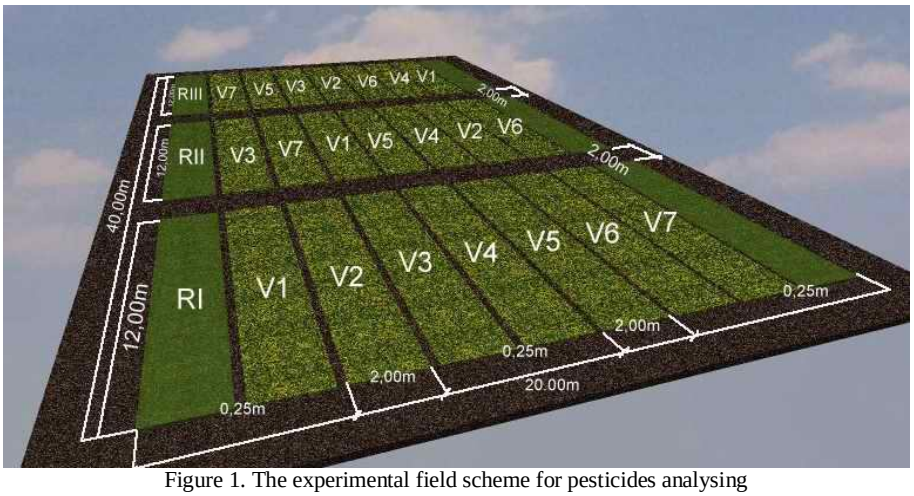

Figure 1. The experimental field scheme for pesticides analysing

For emphasizing the product with the best efficaciousness in controlling, were used 6 variantes: V_1= Fastac 10 EC – 0,02%; V_2= Mospilan 20 SP – 0,025%; V_3= Calypso 480 SC – 0,02%; V_4= Confidor 70 WG – 0,02%; V_5= Actellic 50 EC – 0,1%; V_6= Decis 2,5 EC – 0,05%, whose efficaciousness was compared with the untreated testifier. For that, were cultivated five samples: before the treatment, after 24 hours, after 48 hours, after 72 hours from the treatment accomplishment and at 7 days from the treatments accomplishment (BADEA, 2007; 2008 a, b).

The samples were harvested with a metric frame of 0,5 / 0,5 m. The treatments were accomplished in 19 June 2009 and also in 26 June 2010. The insecticide applying was made with the sprinkling apparatus with manual action with air compression. After 7 days from the treatment the obtained results were not conclusive. For the results interpretation was used the

Henderson – Tilton efficiency coeficient (HENDERSON, 1955).

RESULTS AND DISCUSSIONS

From table1. and figure 2 we can observe that for all five collecting data and for the three repetitions was calculated the alive adults average number.

Table 1.

The testing of some insecticides efficiency in the *Odontothrips loti* Hal. control at S.D. Timisoara 2009

Harvesting date	Repetition	Number of alive insects/ variantes						
		V_1 - Fastac 10 EC – 0,02%	V_2 – Mospilan 20 SP – 0,025%	V_3 - Calypso 480 SC – 0,02%	V_4 - Confidor 70 WG – 0,02%	V_5 - Actellic 50 EC – 0,1%	V_6 - Decis 2,5 EC – 0,05%	V_7 – untrated testifier
19 June 2009 before treatment	**R I**	798	1103	761	925	431	936	1542
	R II	541	724	1094	842	877	833	498
	R III	796	941	490	476	811	782	967
	Average	2135	2768	2345	2243	2119	2551	3007
20 June 2009 after 24 hours	**R I**	523	933	512	631	465	899	788
	R II	194	740	477	298	319	707	1008
	R III	354	838	476	678	393	520	1115
	Average	1071	2511	1465	1607	1177	2126	2911
E% (the efficaciousness coefficient)		**48,18%**	**6,29%**	**35,47%**	**25,99%**	**42,62%**	**13,91%**	-
21 June 2009 after 48 hours	**R I**	199	296	100	255	193	316	247
	R II	114	345	311	78	37	158	1613
	R III	218	252	224	303	329	324	623
	Average	531	893	635	636	559	798	2483
E% (the efficaciousness coefficient)		**69,88%**	**60,93%**	**67,21%**	**65,66%**	**68,05%**	**62,12%**	-
22 June 2009 after 72 hours	**R I**	340	599	303	333	163	23	411
	R II	301	311	489	412	299	879	1414
	R III	236	377	197	209	431	200	1000
	Average	877	1287	989	954	893	1102	2825
E% (the efficaciousness coefficient)		**56,28%**	**50,51%**	**55,11%**	**54,73%**	**55,14%**	**54,02%**	-
26 June 2009 after 7 days	**R I**	219	722	102	414	397	554	1233
	R II	465	919	499	505	308	229	1002
	R III	412	292	599	417	456	819	734
	Average	1096	1933	1200	1336	1161	1602	2969
E% (the efficaciousness coefficient)		**48,01%**	**29,27%**	**48,17%**	**39,67%**	**44,51%**	**36,40%**	-

At 24 hours of treatments execution, in the year 2009, the most species were collected on the seventh variant, namely the untreated testifier - an average of 2911 species, and among the variants to which chemical treatments were used, it was the 2nd variant, the one treated with Mospilan 20 SP - an average of 2511 species. The smallest number of species were collected on the 1st variant, the one treated with Fastac 10 EC- 1071 species.

At 42 hours, at 72 hours and 7 days of treatments executing, the most species were collected on the untreated testifier variants (V1) – an average of 2483 species - at 42 hours, 2825 species at 72 hours and 2969 species - at 7 days; being followed by the variants treated with Mospilan 20 SP - with 893 species - at 42 hours, 1287 species - at 72 hours and 1933 species at 7 days. The smallest number of species were collected on the variants treated with

Fastac 10 EC - 531 species - at 48 hours, 877 species - at 72 hours and 1096 species at 7 days.

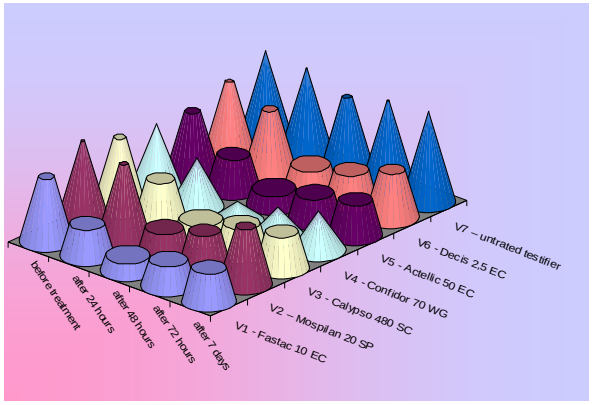

Figure 2. The decreasing of *Odontothrips loti* Hal. alive adults average number after 7 days from the chemical treatments applications in a seed *Lotus corniculatus plot* in 2009

Table 2.

The testing of some insecticides efficiency in the *Odontothrips loti* Hal. control at S.D. Timisoara 2010

Harvesting date	**Repetition**	**Number of alive insects/ variantes**						
		V_1 - Fastac 10 EC – 0,02%	V_2 – Mospilan 20 SP – 0,025%	V_3 - Calypso 480 SC – 0,02%	V_4 - Confidor 70 WG – 0,02%	V_5 - Actellic 50 EC – 0,1%	V_6 - Decis 2,5 EC – 0,05%	V_7 – untrated testifier
26 June 2010 before treatment	**R I**	1215	1111	721	758	936	1032	1150
	R II	745	745	756	932	521	513	498
	R III	365	831	738	307	527	876	1182
	Average	2325	2687	2215	1997	1984	2421	2830
27 June 2010 after 24 hours	**R I**	854	1475	441	725	398	419	1215
	R II	129	635	527	496	451	963	756
	R III	567	232	612	237	492	635	840
	Average	1550	2342	1580	1458	1341	2017	2811
E% (the efficaciousness coefficient)		**32,88%**	**12,25%**	**28.19 %**	**26,50%**	**31,95%**	**16,12%**	-
28 June 2010 after 48 hours	**R I**	191	212	147	197	113	325	1226
	R II	247	463	201	155	152	274	945
	R III	109	330	231	239	236	212	660
	Average	547	1005	579	591	501	811	2831
E% (the efficaciousness coefficient)		**76,48%**	**62,61%**	**73,87%**	**70,42%**	**74,76%**	**66,51%**	-
29 June 2010 after 72 hours	**R I**	266	551	344	362	221	426	1266
	R II	221	340	251	289	356	577	799
	R III	292	314	309	348	131	275	700
	Average	779	1205	904	999	708	1278	2765
E% (the efficaciousness coefficient)		**65,71%**	**54,10%**	**58,23%**	**48,80%**	**63,48%**	**45,97%**	-
03 July 2010 after 7 days	**R I**	545	862	641	764	678	698	1105
	R II	522	1198	632	412	169	842	932
	R III	137	395	376	551	322	471	707
	Average	1204	2455	1649	1727	1169	2011	2744
E% (the efficaciousness coefficient)		**46,59%**	**5,77%**	**23,22%**	**10,81%**	**39,23%**	**14,33%**	-

From data presented in 2009 resulted that the best results were at 48 hours from treatments applying. Thus, the best efficiency in controlling bird´s – foot trefoil thrips *Odontothrips loti* Hal. had the product Fastac 10 EC, with an efficiency coefficient of 69.88%, followed by the products: Actellic 50 EC with an efficiency coefficient of 68.05% and of Calypso 480 SC, an efficiency coefficient of 67.21%. The lowest efficiency coefficient of 60.93% was evaluated for Mospilan 20 SP product.

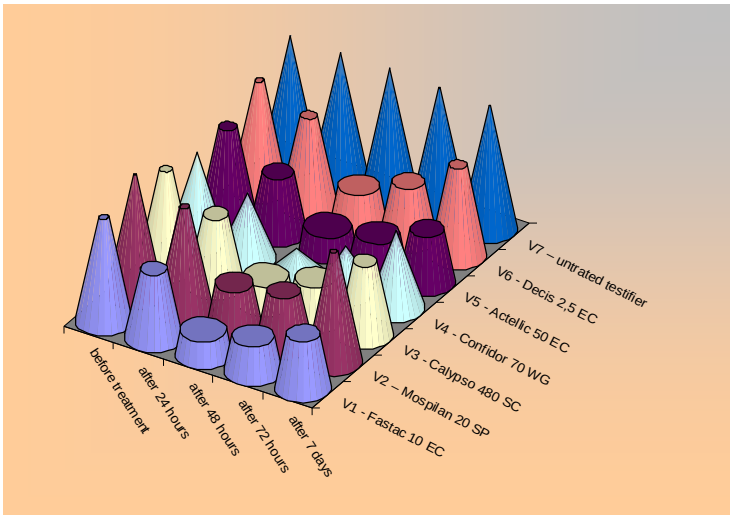

Figure 3. The decreasing of *Odontothrips loti* Hal. alive adults average number after 7 days from the chemical treatments applications in a seed *Lotus corniculatus plot* in 2010

To determine the effectiveness of insecticides in 2010 as in the previous year were tested six insecticides, aiming at products with the best results in *Odontothrips loti* hal. control.

From table 2 and figure 3 is apparent that for all five data collecting for the three repetitions was calculated average number of alived species.

At 24 hours of treatments execution, in the year 2010, the most species were collected on the seventh variant, namely the untreated testifier - an average of 2811 species, and among the variants to which chemical treatments were used, it was the 2nd variant, the one treated with Mospilan 20 SP- an average of 2342 species. The smallest number of species were collected on the 5 th variant, the one treated with Actellic 50 EC - 1341 species.

At 42 hours, at 72 hours and 7 days of treatments executing, the most species were collected on the untreated testifier variants (V1) – an average of 2831 species - at 42 hours, 2765 species at 72 hours and 2744 species - at 7 days; being followed by the variants treated with Mospilan 20 SP- with 1005 species - at 42 hours, 1205 species - at 72 hours and 2455 species at 7 days. The smallest number of species were collected on the variants treated with Actellic 50 EC - 501 species - at 48 hours, 708 species - at 72 hours and 1169 species at 7 days.

From data presented in 2010 resulted that the best results were at 48 hours from treatments applying. Thus, the best efficiency in controlling bird´s – foot trefoil thrips *Odontothrips loti* Hal. had the product Fastac 10 EC, with an efficiency coefficient of 76,48%, followed by the products: Actellic 50 EC with an efficiency coefficient of 74,76% and of Calypso 480 SC, an efficiency coefficient of 73,87%. The lowest efficiency coefficient of 62,61% was evaluated for Mospilan 20 SP product.

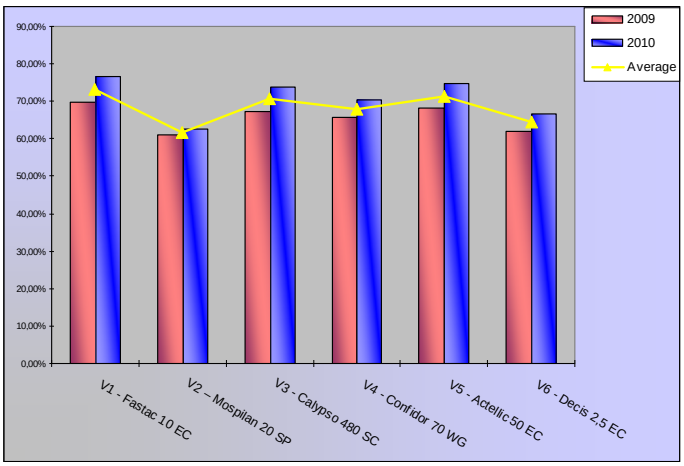

Figure 4. The efficiency coefficient evolution after the application of some chemical treatments in 2009 – 2010 periods at S.D. Timisoara

During the experimental years (2009- 2010) the efficiency evaluated after 48 hours from treatments applying presented in majority of cases very high values.(figure 4).

The best insecticide approved was Fastac 10 EC - in concentration of 0.02%, with an efficiency coefficient that oscillated between 69,88- 76,48%, being in average 73,18%.

The superior results were approved after product testing Actellic 50 EC in concentration of 0.1% the efficiency of insecticide oscillated between 68,05% and 74,76%, being in average 71,41%.

The best results were also obtained after product testing Calypso 480 SC - in concentration of 0.02%, with an efficiency coefficient that oscillated between 68,05% and 74,76%, being in average 71,41%.

The smallest results were obtained after product testing Mospilan 20 SP- in concentration of 0.025%, and also in that case the efficiency was very good, oscillated between 60,93% and 62,61%, being in average 61,77%.

Thus, we concluded that to control by chemical way the bird´s – foot trefoil thrips *Odontothrips loti* Hal. it could be necessary to make treatments in phase of floral button, by application of some commercial products such as: Fastac 10 EC – 0,02% or Actellic 50 EC – 0,1%.

Through the best treatments establishment and also testing some efficient insecticides and a little pollutant it might achieve integrated control systems for disease and pest *Lotus corniculatus* seed.

CONCLUSIONS

In the year 2009, the most elevated average number of alive samples (3007) was obtained from variant untreated, and the lowest average number of alive samples (531) was obtained from the treated variant with Fastac 10 EC.

In the year 2010, the lowest average number of alive samples (547) was obtained from treated variant with Fastac 10 EC, and the most elevated average number of alive samples (2830) was obtained from the variant untreated.

During those two experimental years (2009 - 2010) the efficiency coefficient

Henderson – Tilton calculated after 48 hours from the insecticides applying generally presented the most elevated values.

The most efficient was Fastac 10 EC insecticide at which the efficiency coefficient was in average of 73,18%.

Least efficient was Mospilan 20 SP insecticide at which the efficiency coefficient was in average of 61,77%.

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