RESEARCH CONCERNING THE ATTACK BY *CYDIA POMONELLA* L. ON APPLE IN THE TIMIŞOARA AREA IN 2008

CERCETĂRI PRIVIND ATACUL DE *CYDIA POMONELLA* L. LA MĂR ÎN ZONA TIMIŞOARA ÎN ANUL 2008

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Abstract: *In Romania, the attack of Cydia pomonella on apple trees results in a high percentage of wormy fruit that can reach up to 70% in certain years, which diminishes yield with the same percentage. Fruit attacked are damaged qualitatively, fall earlier than normal and rot because of the infection by Monilia fructigena. Research aimed at establishing the intensity of Cydia pomonella butterfly flight in the Timişoara area in 2008. The biological threshold in Cydia pomonella was established at 9ºC. To determine flight curve in butterflies, we set pheromone ATRA POM traps starting with May 1st, 2008, 2-3 weeks before the supposed appearance of the butterflies, taking into account that the first generation appears around May-June, and the second one about July-August. We recorded captures 3 times a week to develop flight curve. After each monitoring, the butterflies were removed from gluey the traps. When temperature went below 15^{0}C and precipitations were above 10 mm, we made no observations and recorded no data. Results of observations will be supplied to the farmers, if required. In 2008, on May 20, we collected the largest number of Cydia pomonella from the pheromone traps set in the orchard. The lowest number of captures was in the first days of May. We lanced the warning three days after recording the maximum number of 28 individuals. For second generation, maximum captures recorded in 2008 on July 17, and the lowest number of captures was in the first days of July. The warning for second generation we lanced in 2008 on July 20, after recording the maximum number of 99 individuals.*

Rezumat: *În România atacul de Cydia pomonella la meri determină un procent mare de fructe viermănoase, care poate atinge în unii ani peste 70%, ceea ce reduce recolta în aceeaşi proporţie. Fructele atacate sunt depreciate calitativ, cad timpuriu şi putrezesc datorită infecţiei cu Monilia fructigena. Scopul cercetărilor a fost stabilirea intensităţii de zbor a fluturilor de Cydia pomonella, în zona Timişoara în anul 2008. Pragul biologic la Cydia pomonella a fost stabilit la temperatura de 9 ºC. Pentru determinarea curbei de zbor a fluturilor au fost instalate capcane feromonale ATRAPOM începând cu 1 mai 2008, cu 2-3 săptămâni înainte de apariţia prezumtivă a fluturilor având în vedere faptul că generaţia I apare aproximativ în mai-iunie, iar pentru generaţia a II-a au fost amplasate capcanele începând cu data de 1 iulie 2008. Au fost înregistrate capturile de trei ori pe săptămână pentru a se putea reprezenta apoi curba de zbor. După fiecare observaţie fluturii au fost înlăturaţi de pe capcanele cleioase. Dacă temperatura a înregistrat valori sub 15 ºC, iar precipitaţiile peste 10 mm, nu au fost făcute observaţii şi înregistrate date. Rezultatele observaţiilor vor fi puse la dispoziţia fermierilor interesaţi. În anul 2008 in data de 20 mai au fost colectate cele mai multe exemplare de Cydia pomonella, de pe capcanele feromonale amplasate in livadă. Cele mai puţine capturi au fost recoltate în primele zile ale lunii mai. Astfel ulterior s-a eliberat avertizarea după trei zile de cand s-a înregistrat maximul de capturi de 28 de exemplare.Pentru generaţia a II-a, maximul de capturi a fost înregistrat în data de 17 iulie 2008, iar cele mai puţine exemplare de Cydia pomonella au fost găsite în primele zile ale lunii iulie.Avertizarea pentru generaţia a II-a a fost eliberată pe data de 20 iulie 2008, după trei zile de la înregistrarea maximului de capturi.*

Keys words: *apples, atack, Cydia pomonella, flight curve*
Cuvinte cheie: *meri, atac, Cydia pomonella, curba de zbor*

INTRODUCTION

Cydia pomonella L. has, in the conditions of Romania, 2 generations per year. In spring, during the colouring of the floral buds, the larvae start turning into chrysalides, the development limit of the pest being +10°C. The first butterflies start flying during the fruit-forming period. If the weather is warmer in April and cooler in the 2nd and 3rd decades of May, then the butterflies appear earlier.

Caterpillars of the 1st generation penetrate the fruit through the calyx. At the beginning, they stay beneath the skin of the fruit, where they shed for the first time, and then they head towards the seed loculus, where they destroy the seeds. The females of the 2nd generation lay eggs at the end of July – at the beginning of August. During growth, the caterpillar attacks two to three fruits. Fruits attacked by the caterpillars are of low quality upon maturity.

Some of the caterpillars hibernate in fruit storage houses.

MATERIAL AND METODHS

Research was carried out on the apple-tree plantation of Şag (Timiş County) between May and July 2008. In order to determine the imminence of an attack by *Cydiei pomonella* L. around Timişoara and, therefore, the necessity of applying chemical treatments we set out pheromone traps of the ATRAPOM type. In 2008, May the effective temperature was 14.9 °C. In 2008, April the effective temperature was 86°C. In 2008, May the effective temperature was 408.7°C. In 2008, July the effective temperature was 809.3 °C.

We set 3 traps 50 m far from one another, starting with May 1st 2008, i.e. 2-3 weeks before the presumptive appearance of the butterflies, taking into account that the 1st generation of butterflies appears around May-June, and starting with July 1st 2008 for the 2nd generation. Measurements were made 3 times a week (on Monday, Wednesday and Friday), when we noted the number of captures. After each measurement, the captured butterflies were removed from the traps. Where there were captures, we traced flight curves. When there climate fluctuations and there was no maximum of flight, we took into account a number of 5 captures per trap.

RESULTS AND DISCUSSION

In 2008, ever since the first days of May there were captures in the orchard in Şag. (table 1).

In 2008, the first butterflies appeared on pheromone traps during the first days of May, but with a minimum of 7 captures. The maximum captures were on May 20 (28 individuals) at an average temperature of 20.8°C and on May 21, respectively, with 27 captures at an average temperature of 20.3°C (table 1)

According to Figures 1, the flight maximum was on May 20 at an effective temperature of 158.5, and the flight minimum were on May 2 at an effective temperature of 9.7 On May 23 they released another warning concerning a possible attack by *Cydia pomonella* L., with recommendations for chemical treatment of the fruit-trees.

For the second generation one about July-August, in 2008, the first butterflies appeared during the first days of July (table 2).

Most of the captures were on July 17 (99). The least captures were on July 1 (29 captures) and 7 (29 captures), when the average temperature was lower than in the rest of the days, i.e.: 30.9°C and 28.1°C (table 2).

Table 1

Pheromonal traps monitoring from Șag orchard, year 2008, I generation

Date	biological threshold	Date	Temp. mean	Precipit.	Temp.	Captures trap 1	Captures trap 2	Captures trap 3	Total captures
1.05	9	3,6	12,6	-	3,6	2	3	3	**8**
2.05	9	6,1	15,1	-	9,7	2	2	3	**7**
3.05	9	4,9	13,9	-	14,6	3	3	1	**7**
4.05	9	4,0	13,0	-	18,6	1	3	3	**7**
5.05	9	4,5	13,5		23,1	2	5	3	10
6.05	9	4,9	13,9	3,0 mm	28,0	3	3	4	10
7.05	9	5,5	14,5		33,53	3	3	4	10
8.05	9	5,3	14,3		38,8	2	3	5	10
9.05	9	6,0	15,0	0,8 mm	44,8	4	5	4	13
10.05	9	5,7	14,7		50,50	5	6	4	15
11.05	9	5,3	14,3		55,8	4	4	2	10
12.05	9	6,7	15,7		62,5	3	6	5	14
13.05	9	8,2	17,2		70,70	4	6	6	16
14.05	9	10	19,0		80,70	6	7	5	18
15.05	9	9,6	18,6	1,2 mm	90,30	5	5	10	20
16.05	9	9,6	18,6	0,8 mm	99,90	4	8	8	20
17.05	9	11,9	20,9		111,80	6	8	7	21
18.05	9	13,3	22,3	6,2 mm	134,10	7	8	9	24
19.05	9	12,6	21,6	7,6 mm	146,70	8	8	8	24
20.05	9	11,8	20,8		158,50	10	10	8	**28**
21.05	9	11,3	20,3		169,80	8	9	10	27
22.05	9	7,2	16,2	5,0 mm	177,00	10	9	8	25
23.05	9	7,9	16,9		184,90	5	10	10	25
24.05	9	8,6	17,6		193,50	7	10	7	24
25.05	9	11,1	20,1		204,60	6	11	7	24
26.05	9	12,2	21,2		216,80	4	10	9	23
27.05	9	14,5	23,5		231,30	8	8	6	22
28.05	9	16,8	25,8		248,10	2	7	8	17
29.05	9	12,6	21,6		260,70	6	6	2	14
30.05	9	13.0	22,0		273,70	4	1	5	10
31.05	9	13,8	22,8	9,6 mm	287,50	4	3	3	10

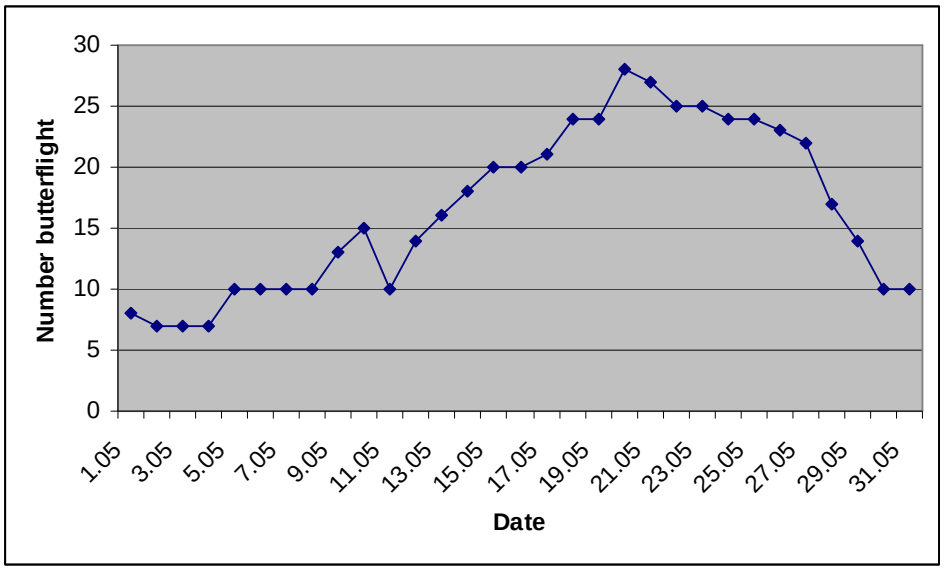

Figure 1. Flight curve in butterflies *Cydia pomonella* L., in May

Table 2

Pheromonal traps monitoring from Şag orchard, year 2008, II generation

Date	Temperature means	Minimal Temperatures	Maximal Temperatures	tn-to 809,3 C	∑(tn-to)	Captures trap 1	Captures trap 2	Captures trap 3	Total captures
1.07	23,4	15,1	30,9	14,4	823,7	12	7	10	**29**
2.07	25,4	16,6	34,5	16,4	840,1	10	12	11	33
3.07	24,7	19,9	30,4	15,7	855,8	11	10	12	33
4.07	24,3	15,9	31,6	15,3	871,1	12	11	15	38
5.07	17,3	12,6	23,0	8,3	879,4	10	10	14	34
6.07	18,5	11,3	25,4	9,5	888,9	11	10	12	33
7.07	21,1	14,4	28,1	12,1	901,0	6	10	13	29
8.07	23,5	14,4	31,6	14,5	915,5	14	12	12	38
9.07	26,2	16,9	35,1	17,2	932,7	14	15	13	42
10.07	22,4	15,9	29,6	13,4	946,1	12	14	19	45
11.07	14,9	13,0	17,0	5,9	952,0	15	15	18	48
12.07	17,1	11,3	24,7	8,1	960,1	16	16	19	51
13.07	18,6	10,2	26,4	9,6	969,7	18	22	22	62
14.07	22,4	13,4	31,3	13,4	983,1	22	21	25	68
15.07	25,1	15,9	34,4	16,1	999,2	31	36	24	91
16.07	27,2	18,8	36,4	18,2	1017,4	33	36	26	95
17.07	28,8	19,5	38,6	19,8	1037,2	36	36	27	**99**
18.07	29,6	20,0	39,7	20,6	1057,8	26	30	21	77
19.07	30,8	21,2	40,4	21,8	1079,6	26	30	21	77
20.07	30,9	21,6	40,7	21,9	1101,5	26	30	21	77
21.07	30,8	22,6	39,9	21,8	1123,3	25	31	20	76
22.07	30,6	21,1	40,4	21,6	1144,9	25	32	19	76
23.07	27,6	19,5	35,3	18,6	1163,5	26	30	18	74
24.07	30,1	19,4	41,8	21,1	1184,6	24	30	19	73
25.07	22,1	16,1	28,7	13,1	1197,7	22	25	15	62
26.07	22,0	11,8	30,8	13	1210,7	16	26	14	56
27.07	24,4	14,5	33,5	15,4	1226,1	15	20	12	47
28.07	26,5	15,3	36,4	17,5	1243,6	15	21	12	48
29.07	27,5	21,2	34,1	18,5	1262,10	15	19	12	46
30.07	22,1	13,2	31,4	13,1	1275,2	10	19	13	42
31.07	25,1	15,9	34,4	16,1	1291,3	12	19	9	-

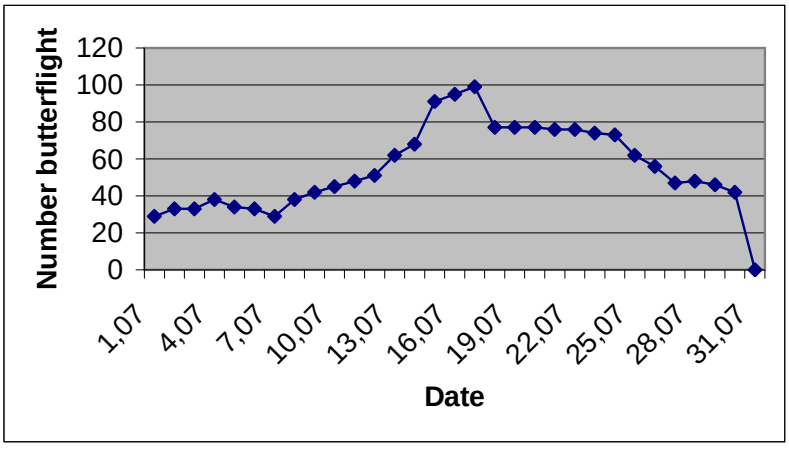

Figure 2. Flight curve in butterflies *Cydia pomonella* L., in July

According to Figures 2, the flight maximum was on July 17 at an effective temperature of 1037,2 and the flight minimum were on July 1 at an effective temperature of 823,7. On July 20 they released another warning concerning a possible attack by *Cydia pomonella* L., with recommendations for chemical treatment of the fruit-trees.

CONCLUSIONS

In 2008, on May 20, we collected the largest number of Cydia pomonella from the pheromone traps set in the orchard. The lowest number of captures was in the first days of May. In May, the attack by *Cydia pomonella* will be much above the average in the studied areas.

For second generation, maximum captures recorded in 2008 on July 17, and the lowest number of captures was in the first days of July.

We lanced the warning three days after recording the maximum number of 28 individuals in May, and 99 exemplars in July.

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