

# THE CHEMICAL CONTROL OF THE CODLING MOTH (*CYDIA POMONELLA* L.) IN THE FRUIT GROWING AREA BANU MARACINE

## COMBATEREA CHIMICĂ A VIERMELUI MERELOR (*CYDIA POMONELLA* L.) ÎN ZONA POMICOLĂ BANU MĂRĂCINE

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**Abstract.** *The chemical method consist in chemical treatments applying, only if the other methods (agrotechnical, mechanical, physical, biological, aso) has not limitedated the pests populations under the economical treshold (P.E.D.) The treatments are apply only when it is necessary using products framed in the III-rd and IV-th toxicity groups, in order to protect the beneficial fauna from the orchards, playing an important role in maintining the biocenotic ballance. In order to increase the treatments efficiency, the insceticides are mixed with fungicides, for controlling at the same time the pests and the phytopathogens agents.*

**Key words:** *Cydia pomonella*, chemical control, pyreteroid products

**Rezumat.** *Metoda chimică constă în aplicarea de tratamente chimice în cazul în care celelalte măsuri (agrotehnice, fizico-mecanice, biologice, etc.) nu au limitat populațiile de dăunători sub pragul economic de dăunare (P.E.D.). Tratamentele se efectuează numai la avertizare și se urmărește folosirea de produse mai ales din grupa a III-a și a IV-a de toxicitate, în scopul protejării faunei utile din cadrul plantațiilor pomicole, cu rol important în menținerea echilibrului biocenotic. Pentru mărirea eficacității tratamentelor, acestea se complexează cu fungicide, pentru a combate agenții fitopatogeni.*

**Cuvinte cheie:** *Cydia pomonella*, combatere chimică, produse piretroide

### INTRODUCTION

The species *Cydia pomonella* L. belong to the *Tortricidae* family and it is one of the most dangerous pest of the apple in Romania.

Due to the climatic conditions from our country, this species present two generation/year, hibernate into a chrysalis cocoon named hibernaculum.

In the absence of the control methods the losses produced by the species *Cydia pomonella* L. can reach 70-80% from the yield.

The chemical method consist in chemical treatments applying, only if the other methods (agrotechnical, mechanical, physical, biological, aso) has not limitedated the pests populations under the economical treshold (P.E.D.)

The treatments are apply only when it is necessary using products framed in the III-rd and IV-th toxicity groups, in order to protect the beneficial fauna from the orchards, playing an important role in maintining the biocenotic ballance.

In order to increase the treatments efficiency, the insceticides are mixed with

fungicides, for controlling at the same time the pests and the phytopathogens agents.

## MATERIAL AND METHOD

The research has been made during 2006 – 2008, in an intensive apple orchard, within the Didactical Station Banu Maracine.

The chemical control tests has been set under the experimental technique standards, according to the randomized blocks with four repetitions.

There has been made observation regarding the attack frequency (F%), the attack intensity (I%) and the attack degree (AD%) on repetitions and variants, and the treatments efficiency (E%) has been determined using the Abbot formula:

$$E = \left( 1 - \frac{a_2}{N - M_2} \right)$$

where:

$a_2$  = the number of attacked fruits at the treated variant;

N = the total number of the analyzed fruits;

$M_2$  = the total number of the unattacked fruits at the control variant. numărul total de fructe neatacate la mator (gradul de atac la mator).

The data has been processed and interpreted through statistic calculus, using programs for the variance analyze.

The pheromones traps has been set early in the spring, the clay plates has been changed every 3-4 weeks function the clogging and the pheromones capsule at every 5 weeks.

## RESULTS AND DISCUSSIONS

The chemical method consist in chemical treatments applying, only if the other methods (agrotechnical, mechanical, physical, biological, a.s.o.) has not limited the pests populations under the economical treshold (P.E.D.)

For the species *Cydia pomonella* L. the most simple criteria for the determination of the right moment for treatments applying it is the adults flight dynamics, established with the pheromones traps.

The adults (male) surveillance has been made with pheromones traps (ATRAPOM), the chemical treatments has been applied applied after 5 – 8 days after the recording of the peak adults flight curve (I. Ghizdavu and L. Oprean).

During 2006 – 2008, at the Didactical Station Banu Maracine, on the observation regarding the biology and ecology of the species *Cydia pomonella* L. (codling moth) we have followed the efficiency of some products used for control this species.

There has been tested a series of insecticides from the group of synthesis pyrethroids and methamorphosys inhibitor.

The experiments has been set in an apple orchard Starkrimson variety after the randomized block method.

The products efficiency has been established through the frequency of the attacked fruits on each variant, analyzing 500 fruits percentage expressed.

Starting with 2006, we have organized an experiment regarding the

pyrethroid products used for controlling the apple codling moth (table 1).

Table 1

**The efficiency of some pyrethroid products used for controlling the apple codling moth, in 2006**

The Product	Dose (%)	% attacked fruits	Efficiency (E %)
Decis 2,5 EC (Mt)	0,03	9,6	94,5
Fastac 10 EC	0,02	6,2	96,8
Cipertrin 10 EC	0,02	4,2	98,6
Cypermethrin 10 EC	0,03	3,6	99,2
Supersect 10 EC	0,03	4,0	98,8

During the first year of research we have tested five products with an efficiency ranged between 95,5% j at the product Decis 2,5 EC, dose 0,03% considered to be the control variant and 99,2% at the product Cypermethrin 10 EC, dose 0,03%.

The other three products have presented a superior efficiency to the control variant: 96,8% for the product Fastac 10 EC, dose 0,02%, 98,6% for the product Cipermetrin 10EC, dose 0,02% and 98,8% for the product Supersect 10 EC, dose 0,03%.

The percentage of attacked fruits has been ranged between 3,6% for the product Cypermethrin 10 EC and 7,2% for the product Fastac 10 EC, comparative with the product Decis 2,5 EC, considered to be the control variant with 9,6% attacked fruits.

During 2007 there has been tested 6 products from the pyrethroid group, with an efficiency ranged between 96,9% for the product Fastac 10 EC (table 2), 99,4% for the product Cypermethrin 10 EC and 99,6% for the product Supersect 10 EC, comparative with the control variant (Decis 2,5 EC) with an efficiency of 95,2%. The other products have presented a percentage of the attacked fruits ranged between 3,8% and 6,2%. The highest percentage of attacked fruits (9,8%) has been recorded at the variant treated with 37 CE.

Table 2

**The efficiency of some pyrethroid products used for controlling the apple codling moth, in 2007**

The Product	Dose (%)	% attacked fruits	Efficiency (E %)
Decis 2,5 EC (Mt)	0,03	9,8	95,2
Fastac 10 EC	0,02	7,5	96,9
Cipertrin 10 EC	0,02	4,2	98,7
Cypermethrin 10 EC	0,03	3,6	99,4
Supersect 10 EC	0,03	3,2	99,6
Fastac 2,5 EC	0,01	4,0	98,6

During the third year of research (2008) it came out that the highest efficiency it was recorded at the same variants like in the previous years, 99,8% for Cypermethrin 10 EC, dose 0,03%, 99,4% for Supersect 10 EC, dose 0,03, and 99,3% for Cipermetrin 10 EC, dose 0,02 (table 3).

The lowest efficiency has been recorded at the control variant treated with Decis 2,5 EC. The evolution of the attacked fruits percentage during 2008, has been ranged between 3,2% recorded at the variant treated with Cypermetrin and 6,2% at the variant treated with Fastac, comparatively with the control variant, where has been recorded 6,7% attacked fruits.

Table 3

**The efficiency of some pyrethroid products used for controlling the apple codling moth, in 2008**

The Product	Dose (%)	% attacked fruits	Efficiency (E %)
Decis 2,5 EC (Mt)	0,03	6,7	95,5
Fastac 10 EC	0,02	6,2	97,9
Cipertrin 10 EC	0,02	4,0	99,3
Cypermetrin 10 EC	0,03	3,2	99,8
Supersect 10 EC	0,03	3,5	99,4
Fastac 2,5 EC	0,01	4,5	98,4

In conclusions, we can ascertain that from all the six pyrethroids we noticed the products Cypermetrin 10 EC, dose 0,03%, Supersect 10 EC, dose 0,03% and Cipermetrin 10 EC, dose 0,02%, which ensured a very good protection, these products can be recommended to be apply in any orchard.

During the research period we have followed the effect of some inhibitor for the arthropods metamorphosis used for control this species.

Thus, we have initiated a series of research regarding the tests of these products, three in the first year and five in the next two years.

The biological efficiency of the inhibitor for the arthropods metamorphosis in 2006 had presented values ranged between 96,8% for the product Dimilin 25 WP, dose 0,03% and 98,7% for the product Calypso 480 SC, dose 0,02% (table 4). At the variant treated with Cascade has been recorded an biological efficiency of 96,8%.

The attacked fruits percentage has been of 3,5% at the variant treated with Calypso 480 SC and 3,8% at the variant treated with Cascade 5 EC, comparative with the control variant treated with Dimilin 25 WP, which has been recorded with a percentage of 5,2%.

Table 4

**The biological efficiency of some inhibitors for arthropods metamorphosis used for control the apple codling moth, in 2006**

The Product	Dose (%)	% attacked fruits	Efficiency (E %)
Calypso 480 SC	0,02	3,5	98,7
Cascade 5 EC	0,05	3,8	98,2
Dimilin 25 WP (Mt)	0,03	5,2	96,8

During 2007 we have increased to five the number of products.

From the analyze of the results regarding the percentage of attacked fruits, we notice that this percentage has been ranged between 2,7% at the variant treated with the product Calypso 480 SC and 8,2% at the variant treated with the product Rimon 10 EC.

Other variants have presented intermediary values ranged between 3,2% and 5,6% (table 5).

Table 5

**The biological efficiency of some inhibitors for arthropods metamorphosis used for control the apple codling moth, in 2007**

The Product	Dose (%)	% attacked fruits	Efficiency (E %)
Calypso 480 SC	0,02	2,7	99,6
Cascade 5 EC	0,05	3,2	98,7
Dimilin 25 WP (Mt)	0,03	4,1	97,2
Nomolt 15 SC	0,05	5,6	96,3
Rimon 10 EC	0,06	8,2	93,2

The treatments efficiency has been ranged between 93,2% at the variant treated with Rimon 10 EC and 99,6% at the variant treated with Calypso 480 SC. The other products has been recorded with values of the efficiency over 96%.

In 2008 (table 6), the efficiency of the treatments has been good, with values over 99,8% at the variant treated with Calypso 480 SC, followed by the variant treated with Cascade 5 EC (98,9%) and Dimilin 25 WP considered to be control variant (97,5%).

Table 6

**The biological efficiency of some inhibitors for arthropods metamorphosis used for control the apple codling moth, in 2008**

The Product	Dose (%)	% attacked fruits	Efficiency (E %)
Calypso 480 SC	0,02	2,6	99,8
Cascade 5 EC	0,05	3,1	98,9
Dimilin 25 WP (Mt)	0,03	4,2	97,5
Nomolt 15 SC	0,05	5,1	95,9
Rimon 10 EC	0,06	4,7	94,8

The other two products has been recorded with values lower than the one recorded at the control variant 95,9% at the variant treated with the Nomolt 15 SC, doza 0,05% și 94,8% la produsul Rimon 10 EC.

## CONCLUSIONS

Following the obtained results we can draw the conclusion that for the control of the apple codling moth it can be used without any reserve the products Calypso 480 SC and Cascade 5 EC, which have presented an efficiency over 98,0%.

We have to mention that though the biological products have presented a lower efficiency comparative with the chemical products, we recommend the promotion and use of these products having in mind that these products do not pollute the fruits, ecosystem and the environment.

Also we recommend to choose the product function the vegetation

phenophase of the plants, as well the alternation of the products during the vegetation period, in order to avoid the appearance of resistant forms of the pest due to the exaggerate use of a single product.

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