THE EVALUATION OF THE RESULTS IN FIGHTING OF APPLE WORM *CYDIA POMONELLA* IN FIELD CONDITIONS , BY „ATTRACT AND KILL" METHOD

EVALUAREA REZULTATELOR ÎN COMBATEREA VIERMELUI MERELOR, *CYDIA POMONELLA* ÎN CONDIȚII DE CĂMP, DUPĂ METODA „ATTRACT AND KILL".

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Abstract: *The research objective was the estimation of results in fighting the apple worm Cydia pomonella in field condition, by the application of specific sexual attractive pheromon, following the „attract and kill" method.*

Rezumat: *Obiectivul cercetărilor a fost evaluarea rezultatelor în combaterea viermelui merelor, Cydia pomonella în condiții de câmp, prin aplicarea feromonului atractant sexual specific, după metoda „attract and kill". Prin metoda „attract and kill", proporția fructelor atacate a scăzut cu aproximativ 80%, având o eficacitate mai redusă decât chimioterapia, dar metoda se impune prin lipsa efectelor secundare în ceea ce priveşte poluarea ecosistemului.*

Key words: apple worm, pheromonal traps, *„ attract and kill" method*.
Cuvinte cheie: *viermele merelor, capcane feromonale, metoda „attract and kill"*.

INTRODUCTION

The apple worm, *Cydia pomonella,* still remains, for the apple plantations, one of the most frequent pests of economical importance.

The level of population at this specie, frequently overwelmes the value of the economical threshold of damaging and so in the fruit growing plantation there are signalled important loss.

These damages are quantitatives-the pest decrease the level of production (phenomenon met more by the grubs from the first generation of the specie) and also qualitative, afecting the comercial aspect of fruits (phenomenon met mostly at the second generation grubs of the specie).

For maintaining the population below PED value and for imprinting on the population dynamics a decreasing propensity , it must be developed a complexe strategy of preventing and fighting the apple worm. With this strategy, the fruit growing plantation owners, unfortunetly, are applying some chemical treatment with different insecticides. Even if the method presents a raised biological eficiency, there has been showen in time that the colateral effects of chemotherapy have been marked.

For evoiding the fruit contaminations with pesticide residues there are imposed the utilisation of figthing methods, which must be developed from the morphological, biological and behavioral characteristical feature of the specie, which has been developed in the present project.

The research objective was the estimation of results in fighting the apple worm *Cydia pomonella* in field conditions, by the application of specific sexual attractive pheromon, following the „attract and kill" method.

MATERIALS AND METHOD

The experimental field, an intensive apple plantation, had an 1,90 ha area, placed on a low declivity field, with north-westic exposal. In this field, organised in the fruit growing plantation at UASVM Cluj-Napoca, for accomplishing the proposed objective, 3 experimental variants were placed.

● V1 ● Fighting method „attract and kill".

In the estic part of the experimental field, was delimitated an areaof 0,40 ha, on which were applied 140 ml ofthe experimental product MESAJ CP, synthesized in the Chemical Research Institute „Raluca Ripan„ from Cluj-Napoca.

The product was used in 3 phases: once in the proximity of the adult flight starting from the hibernating generation and then twice, at the adult flight from the summer-autumn generation, this one beeing more long-drawn. We tried in the way so the tested product should cover the range of 6 weeks from the adult flight period.

The product was placed in the upper section of the trees horizontal branch, at a height variating betweed 1,5 – 2 m from the soil.

●V2 ● The fighting method by using the chemical tratement with insecticides.

In this variant , which has an area of 1,1 ha, were applied 4 tratements (2 treatements per generation). The chemical treatement was applied on warning, in according to the homologated methodology. For fighting was used the product Reldan 40 EC 0,1 %.

●V3 ● The untreat control

This variant was placed in the westic part of the experimental field, on a surface of 0,30 ha. In this variant weren't applied any method of fighting angainst the specie *Cydia pomonella.*

The evaluation of the experimental results was made by two means :

- Thru monitorising the flight activity of the adults, with the sexually atractant pheromon ATRAPOM, placed in Tetratrap traps. In every experimental variant were placed 3 traps, on which were made 3 readings per week.
- The attacked fruit frequency analyse in every variant, in the fall, at the crop.

RESULTS AND DISCUSSION

Year 2007, was a very favorable year for growing and development of the apple worm, *Cydia pomonella*. This fact is confirmed by the activity og adult flight, on bothe generation. The level of captures realised by the pheromonal traps in all those 3 experimental variants is past in table 1.

In the untreated control variant, the first captures were realised at the date of 8th of may, and the adults flight was finished on the 27th of august. Inside the flight period, with the help of those 3 pheromonal traps were captured 254 males, from which 96 at the hibernant adult generation flight and 158 at the summer adult flight. The capture level, of 32 males per trap at the first flight and 52,67 males per trap at the second flight, shows that the population level was way above the economical pest limit value.

In the chemical treated control variant (Reldan 40 EC 0,1 %), the level of captures were 15 males, from which 6 males at the first flight and 9 males at the second flight. The flight period in this variant was much shorter. At the first flight, the number of captures was 93,75 % lower than the untreated control variant and 94,30 % lower in the second flight.

In the „attract an kill" variant, was obtained the lowest level of captures. On the entire

period of pest monitorising, were recorded 5 captures, 3 captures on the first flight and 2 captures on the second flight. At the first flight, the number of captures was with 96,88 % lower than in the untreated variant and with 98,73 % lower than the second flight

In this variant, the pheromon application method, had certainly more powerfull effect of male desorientation, by disturbing the pheromonal transmision.

Table 1

The capture situation of *Cydia pomonella* with the help of pheromonal traps (Cluj-Napoca, 2007)

Variant no.	Variant	No. of captures at the first flight	No. of captures at the secon flight
1.	„attract and kill".	3	2
2.	Chemical treated control	6	9
3.	Untreated control	96	158
TOTAL		105	169

In table 2, it is presented the situation of the attacked fruits in all those 3 experimental variants.

Because of the rised up level of population of *Cydia pomonella,* in the untreated control variant the attacked fruit frequency had the value of 69 %.

In all those 2 variants, the percent of attacked fruits had lowed remarkable.

In the chemical treated control, were applied 2 treatments per generation(Reldan 40 EC 0,1 %), the percent of attacked fruits was of 3 %, which means an eficiancy of 95,65 % difference towards the untrated control variant. Although, the biological efficiency results of the insecticides confirm son this time as well, it must be reminded the fact that this method, ecologicaly speaking it is the most polluent. At this method, certainly it is manifested also the cumulative (cronic) toxicity of the used insecticide, more that the fruits have as a first utilisation the consumption as fresh fruits.

In the new variant, the „attract and kill„ variant, the attacked fruit percent was of 14 %. Against the untreated control variant, the method efficiency was of 79,71 %.

In this variant were marked the attacked fruits, even if in the flight period of the adults were noticed the lowest level of male capture. Certainly, the proximity of this area of the untreated area, permited the inseminated females to fly and to deposit their custard in this variant.

Table 2

The efficiency of the tested methods, evaluated thru the attacked fruits frequency (Cluj-Napoca, 2007)

No. Variant	Variant	% attacked fruits	Efficiency %
1	„attract and kill".	14	79,71
2	Chemical treated control	3	95,65
3	Untreated control	69	0

From the presented data in those 2 tables, results that both methods of fighting the apple worm can include the fighting strategy, chosing the method being made varying with the level of population and the crop culture system.

CONCLUSIONS

1. The apple worm remains still an important pest of apple plantation.

2. The practicability of the chemical treatment regarding the fighting this pest, can reduce the frequency of the attacked fruits with 95,95 %.

3. The fighting method "attract and kill", has an efficiency of 79,91 %.

4. This method, may produce and disturb the pheromonal transmission thru the disorientation of males.

5. The fighting method “attract and kill“, will impose thru its ecological character, the method being unpolluted.

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