

# The efficiency of spraying with insecticide against the invasive moth *Cameraria ohridella*

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**Abstract** One of the most efficient methods, of maintaining at a low population level *Cameraria ohridella*, is to destroy the majority of wintering pupae from litter. According to Fora *et al.* (2010), in 100 g of litter there are wintering more than 400 copies, and mortality at this stage is between 4.1 to 12.9%. However, the mechanical control by collecting and destruction of litter, in the autumn, must be supplemented by other measures during all growing seasons. One of these methods is chemical control, especially in forest stands, parks with large areas, where the mechanical method is inefficient [3], or difficult to be applied.

**Key words**

*Cameraria ohridella*,  
 insecticides, spraying  
 efficiency

The insect *Cameraria ohridella* is a pest which likes heat [1] and makes important damages on horse chestnuts trees. In previous years, in Axente Sever Square in Timișoara, the attack on horse chestnut leaf by miner moth was at a high level and strong. Following the resulted damages the defoliation was total early in September, and second time flowering [1] became a frequent phenomenon. In case of early and total loss of foliage, the physiological photosynthesis process is disturbed, including the movement of crude and elaborated sap, which has as result the fact that the trees look in September as they should look in late autumn. In this situation autumn rainfalls conducted to a second flowering, a phenomenon with major repercussions on fructification in next year. Thalmann *et al.* (2003) observed in natural horse chestnuts forest stands in South-Eastern Europe a decreasing medium fruit size at trees which are strongly damaged by the pest. Also, on a long period of time, the injuries caused during more growing season may cause the sensitization of the affected horse chestnut trees, so that, in time, a pathogen or other insect can cause major damages on host plant *Aesculus hippocastanum*.

For example in appearance, there is high frequency of brown spots produced in next growing season by

*Guignardia aesculi*. This occurs after strong attacks of dangerous moth *Cameraria ohridella*.

**Materials and Methods**

Researches on the efficiency of insecticide treatment on invasive moth *Cameraria ohridella* have been performed in Axente Sever Square in Timișoara. In this area are some alignments of horse chestnuts, totally 32 trees. Sixteen horse chestnut trees have been used for this research.

The following trial replication have been use:

- CC<sub>1</sub>- untreated, spraying with water;
- CC<sub>2</sub>- spraying with *Bacillus thuringiensis* var. *aizawai* 1% (Xentari) + organosilicone 0,1% (Silwet Gold);
- CC<sub>3</sub>- Azadirachtin 1,5% (NeemAzal) + organosilicone 0,1% (Silwet Gold);
- CC<sub>4</sub>- Abamectin 0,5% (Vertimec) + organosilicone 0,1% (Silwet Gold).

Silwet Gold is an adjuvant which increases the absorption at stomata level by reducing the active tension in watery solutions.

Trial blokes in accordance with EPPO standards are presented in figure 1.

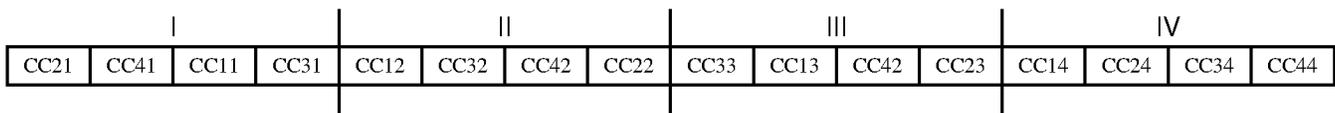


Fig. 1. Trial replications

The monitoring of adult flight, on all growing season of 2010, was carried out using yellow sticky traps baited with synthetic pheromone AtraCam, beginning with 27 of April. It have been used four traps baited with pheromone lure, one pheromone trap for 4 horse chestnut trees. Once in four weeks, the sticky traps and pheromone lures has been replaced. The traps were viable until early October. After the peak of moth flight, once in seven days in each sample tree have been taken 25 samples of leaves, totally 100 leaves on each replication. Observations have been done on leaves following larval development. When most larvae were middle-aged, which after Šefrová and Skuhřavý (2000) larva cephalic capsule width between 0.2 and 0.3 mm, sprayings were applied (figure 2). Treatment was applied with a sprayer which produces a toxic fog.



Fig. 2. Spraying 04.06.2010

The efficiency of the treatments has been assessed in 7 and 14 days after application, for each variant using a number of 100 leaves. The number of dead larva found

was compared with the number of live larva found on untreated variants.

## Results

Chemical control of insect pests in parks include, in addition to ensure the efficiency of insecticides, special measures in order to protect the population. This is the reason why in the test was used an active substance considered “environment friendly” and not dangerous for non-target insects. Using a biological preparation based on *Bacillus thuringiensis* and natural herbal extract Azadirachtin, there is a possibility to control dangerous *Cameraria ohridella* moth population. The third used substance is Abamectin, which is recommended for the control of spider and miner moth populations. In case of using this substance, further measures must be taken to protect bees, fish or other aquatic organisms.

In the year 2010, the maximum flight level of the insect was recorded in middle of May. After hatching, the larvae have penetrated the mesophylum of leaves, where they started to feed. The moment of spraying was on 4 June, during which the larvae were mostly middle-aged. The results of the spraying, estimated at 7 or 14 days, are shown in figure 3.

At 7 and 14 days after the spraying, the best efficiency has Abamectin, with an efficiency of 96.01% and 98.93%. This efficiency ensures the success of spraying. From the point of view of the other two active substances, Azadirachtin had initially, at seven days, a better efficacy (71.42%) in comparison with *Bacillus thuringiensis* (just 69.91%), due to immediate “antifeedant” effect. But on longer terms, after 14 days, the preparation based on *Bacillus thuringiensis* had a slightly higher efficiency (figure 3).

Efficacy in 14 days of active substances like Azadirachtin (74.88%) and *Bacillus thuringiensis* (80.14%) require a second new spraying.

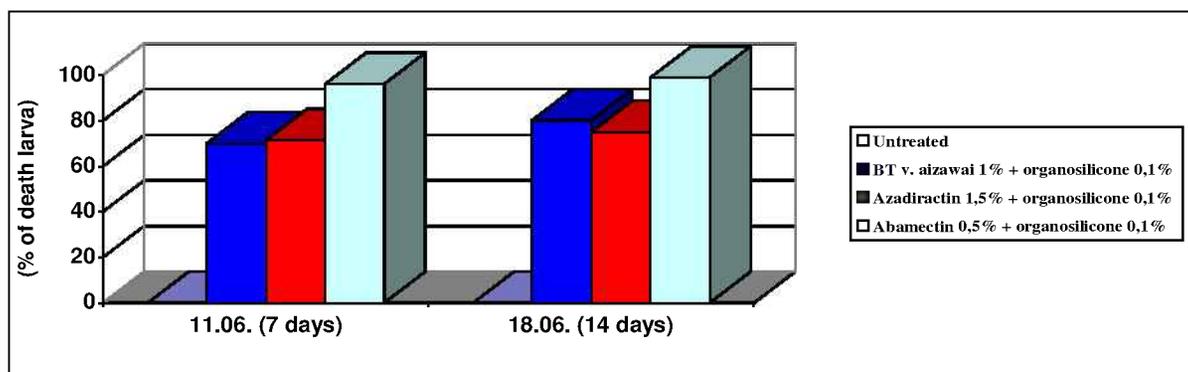


Fig. 3. Spraying efficiency against *Cameraria ohridella* larvae

## Conclusions

The results of spraying with *Bacillus thuringiensis* var. aizawai 1%, Azadirachtin 1.5%, Abamectin 0.5%, on the middle-aged larvae of *Cameraria ohridella*, allowed getting to the following conclusions:

- most efficiency (98,93% after 14 days) had Abamectin 0,5%;
- good efficiency had *Bacillus thuringiensis* var. aizawai 1% (80,14% after 14 days), though an additional spraying is recommended;
- good efficiency had Azadirachtin 1,5% (74,88% after 14 days), an additional spraying is recommended, or mixing with *Bacillus thuringiensis* var. aizawai 1%.

## References

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