

## The Efficacy of European Fruit Lecanium, *Parthenolecanium corni* (Bouché, 1844) Control Using Natural Products

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### Abstract

*This study is focused on testing the effectiveness of natural insecticide treatment compared with conventional insecticides on overwintering nymphs of the European fruit lecanium. In February of 2017, two experiments occurred under laboratory conditions. The tested products were Boundary SW® (seaweed and succulent extract), Konflic® (plant extract), Ekol® (canola oil) and a tank-mix of Ekol® + Reldan 22® (canola oil and chlorpyrifos-methyl) as a chemical standard. The most effective product tested was the chemical standard tank-mix of Ekol® and Reldan 22® – 100% effective in all experiments. Great efficiency was also achieved by Ekol® (canola oil) in high concentrations.*

**Keywords:** European Fruit Lecanium, pest, orchards, overwintering nymphs, natural insecticides

### Introduction

European fruit lecanium *Parthenolecanium corni* (Bouché, 1844) (Hemiptera: Coccoidea) is a Palearctic polyphagous species with a worldwide distribution (Hommay et al., 2007). This pest infests a wide range of host plants, including plums (*Prunus* sp.), currants (*Ribes* sp.), hazelnut tree (*Corylus avellana*) and many others. Young summer nymphs suck mostly on leaves and, when the population reaches high levels, may cause serious damage. Nymphs produce honeydew, which also damages leaves and fruits (Sforza, 2000). Honeydew serves as a substrate for saprophytic fungi, for example black sooty that reduces transpiration and photosynthesis in plants. The worst damage is considered the defoliation of plants and in a heavy infestation the plant may even die. We hope to find an effective treatment that is suitable for integrated pest management (IPM) in orchards, because IPM systems use all options to reduce pest populations with a priority on non-chemical measures.

### Material and Methods

Two methods of application were employed. In the first experiment, there were five branches sufficiently infested with nymphs treated through direct spraying with a mechanical pump sprayer. For the second experiment, the immersion method was used for another five branches sufficiently infested with nymphs. Infested branches were immersed in treatments and control for 5 s. There were 6 variants in tests and control. Each variant and control consisted of four replications and each replication consists of 100 nymphs ( $n = 400$  for each treatment, total  $N = 5600$ ). The nymphs, treatment and distilled water as control for each branch were used only once. The efficacy of the plant protection products was evaluated after 12 days. The formula used for the calculation of percentage reduction of pest populations, respectively the efficacy of tested products, over controls used the following formula given by Henderson & Tilton (1955), referring it as a modification of Abbott (1925).

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## Results and Discussion

Tank-mixes of Ekol® (canola oil; 1 litre/ha) and Reldan 22® (chlorpyrifos-methyl; 2,7 litre/ha) caused a 100% mortality of overwintering nymphs. But we have also found that Ekol® itself treatment is also very effective against overwintering nymphs of European fruit lecanium, if more concentrated spraying is used (Ekol® 20 litres and Ekol® 30 litres per hectare). Skalský (2016) also published the insufficient efficacy of Ekol® 10 litres per hectare against European fruit lecanium. We can say in general, that there are widely used oil plant protection products in the plum orchards, which are very effective against a wide range of overwintering pests. The mode of action for many oils against pests is suffocation and water loss (Copping & Duke, 2007). The other two natural plant protection products, Boundary SW® and Konflic®, had insufficient efficacy in both tests. The results are shown in the Figure 1. Although the tank-mix of Ekol® and Reldan 22® has been shown to be 100% effective, the use of the higher concentration of auxiliary plant protection product Ekol® itself showed almost the same effectiveness. Therefore, we can recommend the use of higher concentrated Ekol® against European fruit lecanium in orchards in the early spring.

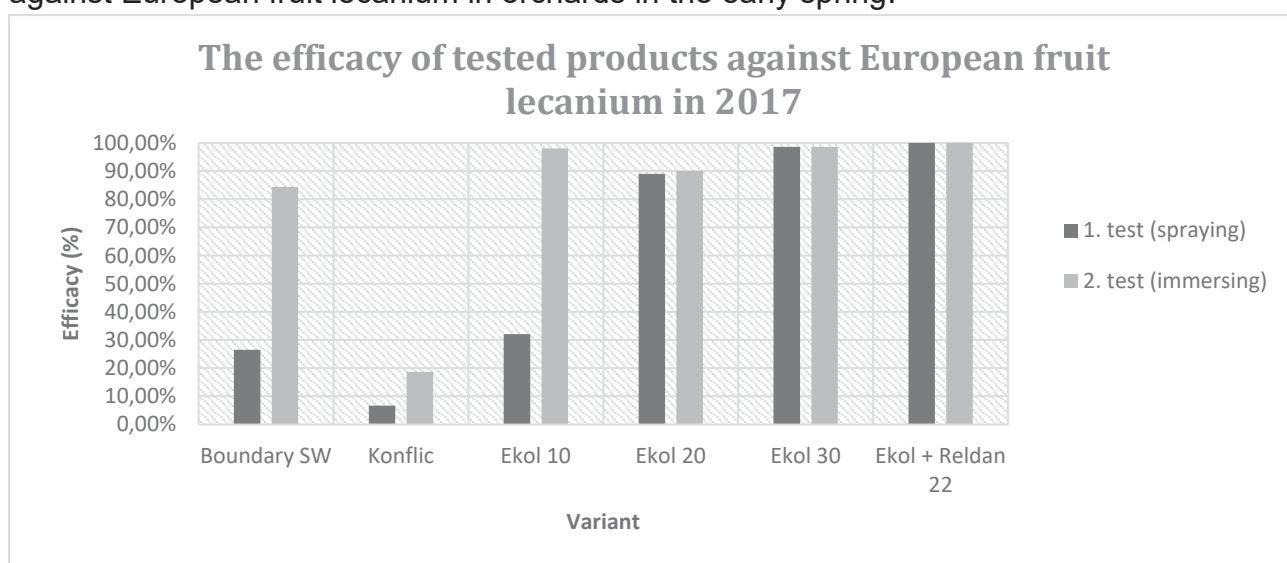


Figure 1: The efficacy (according Abbott) of the tested plant protection products against overwintering nymphs of European fruit lecanium (*Parthenolecanium corni*) in 2017.

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## Citation of the full publication

The citation of the full publication will be found on Ecofruit website as soon as available.