

# Exploring possibilities for integrated control of citrus mealybugs (*Planococcus citri*) in roses

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## Introduction

Since the 2000's, the citrus mealybug *Planococcus citri* (1) has become a key pest in rose greenhouses in The Netherlands. While adopting a more integrated approach toward controlling (other) pests, growers have abandoned regular applications of broad spectrum pesticides, thus allowing mealybugs to become more widespread. In the bent branches cultivation system, scouting is difficult and the first mealybug hotspots are often unnoticed. The old woody branches below the fresh bent canopy are usually infested first.

As chemicals against mealybugs are also harmful for beneficials, mealybugs form an obstacle for the IPM (Integrated Pest Management). Since 2004 a series of experiments has been conducted in order to develop an integrated control strategy for this pest.

## Experiments conducted

- Efficacy tests of pesticides on mealybugs.
- Cage trials for selecting suitable parasitoids (*Allotropa musae*, *Leptomastix dactylopii*, *Coccidoxenoides perminutus*, *Leptomastidea abnormis*, *Anagyrus pseudococc*) on individual rose plants.
- Laboratory studies (on leaf discs) on predation by generalistic predatory mites (*Euseius ovalis*, *Amblyseius swirskii*, *Amblyseius alpinus*, *Amblyseius cucumeris*, *Amblyseius degenerans*).
- Greenhouse experiment with three parasitoids and 2 predatory mites on a rose crop.
- Greenhouse experiment with 5 predatory mites on isolated plant groups.

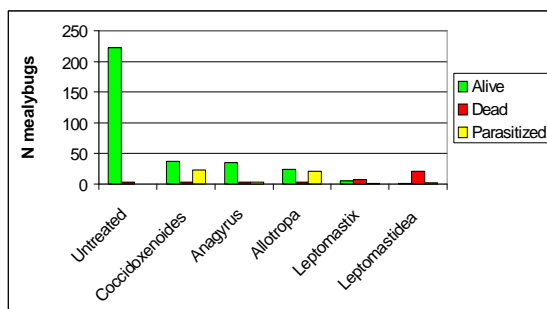


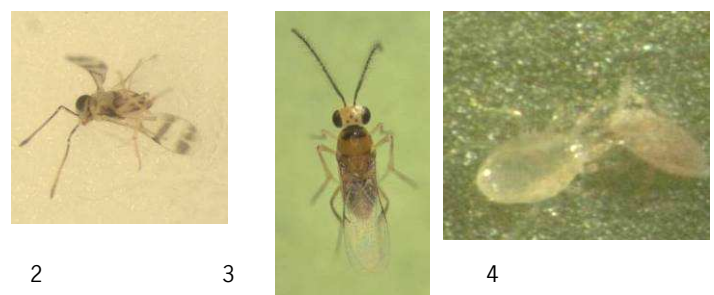
Figure 1: Effect of 5 parasitoids on infected plants



1 Infested crop (left), male (top right), parasitized female (right below)

## Major results achieved

- Imidacloprid and acetamiprid were found the most effective chemicals, but very harmful for the beneficials.
- Spraying with a wetting agent 3 hours prior to a chemical application increased the control quality.
- In cages, all the parasitoid species achieved high parasitization rates (figure 1). *Leptomastidea abnormis* (2) and *Leptomastix dactylopii* (3) were the most effective species.
- In a crop, inundative release in hot spots resulted in near extermination of mealybug colonies.
- Active distribution of 3 parasitoid species tested was poor. Parasitization rate of colonies: only a few meters from the release points were weakly parasitized.
- Predatory mites (4) attacked the wandering "crawlers" (young larval stages of the mealybugs) but avoided the hot spots. They did not prevent the formation of new mealybug colonies



## Further research

- Experiments in commercial greenhouses are being carried out at the moment with a parasitoid combination (*Leptomastidea abnormis*, *Coccidoxenoides perminutus* and *Leptomastix dactylopii*) and the predatory beetle *Cryptolaemus montrouzieri*.