

Predators and Parasitoids for Citrus Under Protective Screen Production System

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Summary: The citrus under protective screen (CUPS) is a successful production system for producing citrus free from huanglongbing (HLB) and its vector, Asian citrus psyllid (ACP). However, pests such as mites, citrus leafminer (CLM), thrips, scales, and mealybugs were able to selectively enter CUPS through the permeable screen or doors. Among some of these such as mites and CLM were more common than others. Maintenance sprays of insecticides and miticides may be needed in CUPS for suppressing pests such as mites and CLM. However, several small predators and parasitoids followed these pests in CUPS. Predatory mites from the family Phytoseiidae attack several economically important pests, especially phytophagous mites. Several species of predatory mites were observed in CUPS particularly *Amblyseius tamatavensis*

Blommers and *Typhlodromalus peregrinus* (Muma) were abundant. An investigation of traditional open groves in Florida resulted in finding 29 species of phytoseiid mites which provide an ample source for evaluating the predatory potential of several species for use in citrus pest protection, including CUPS. *Amblyseius aerialis*, one of these species, and a commercially available species, *Amblyseius swirskii*, were evaluated against citrus rust mite and citrus red mite and were later found suitable for their development and reproduction. Several species of parasitoids such as *Pnigalio minio* attacking CLM, *Aphytis melinus* and *Coccophagus lycimnia* attacking scales, and *Leptomastix dactylopii* attacking mealybugs were also present in CUPS. These findings suggest that although hot and humid compared to traditional open

production system, CUPS provide suitable environment for biological control agents. Pest monitoring is important for CUPS to identify the need and timing of application of insecticides if needed to limit their use due to the concerns of insecticide resistance and negative effects on any beneficial organisms that may exist or released from commercial sources.

Take Home Message:

- Scouting is needed in CUPS to identify pests that pose a concern and make timely management decisions.
- CUPS provide conducive environment for beneficial organisms.
- Limited use of insecticides and miticides helps with conserving beneficial organisms and reducing insecticide resistance.

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