



# *Delphastus catalinae*

## Whitefly Lady Beetle

### DESCRIPTION:

*Delphastus* is a specialized whitefly predator in the lady beetle family. Adults are tiny, 1/15-inch (1.4 mm) long, dark brown to black, hemispherical beetles; females have reddish yellow heads, lighter colored than males. Larvae are elongated, cream colored, covered with short fine hairs and have conspicuous legs. The adult beetles fly, while larvae are slow moving and travel from plant to plant on leaves.

### TARGET PEST:

Greenhouse whitefly (*Trialeurodes vaporariorum*); Banded-winged whitefly (*Trialeurodes* spp.); Sweetpotato whitefly, silverleaf whitefly (*Bemisia* spp.); Woolly whitefly (*Aleurothrixus floccosus*); Azalea and hibiscus whitefly (*Pealius* spp.); Cloudywinged, citrus and rhododendron whitefly (*Dialeurodes* spp.); Citrus blackfly (*Aleurocanthus woglumi*)

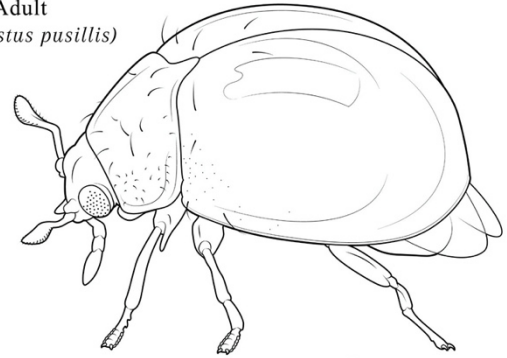
### USE IN BIOLOGICAL CONTROL:

*Delphastus* is used to control whiteflies in tropical and semi-tropical plantings as well as commercial vegetable greenhouses. *Delphastus* avoids feeding on parasitized whiteflies, therefore it is compatible with the use of *Encarsia* spp. and *Eretmocerus* spp. whitefly parasites. *Delphastus* also tends to feed in high-density whitefly populations, while parasites do best at lower densities of whiteflies. *Delphastus* adults prefer feeding on whitefly eggs. Optimum conditions are moderate to high temperatures of 61-90°F (16-35 °C). *Delphastus* do not fly at temperatures below 55 °F (13 °C). *Delphastus* do not enter diapause under short-day conditions, and therefore remain active all season.

Small Ladybird Beetle

Adult

(*Delphastus pusillis*)



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### LIFE CYCLE:

The complete life cycle takes 21-25 days at 78-86°F (25-30°C).

Eggs are yellowish ovals, laid on the end in clusters on the underside of leaves. Females lay 2-6 eggs per day, and can lay over 300 eggs in their 65-day life time. Females must eat 100-150 whitefly eggs per day to initiate and sustain egg laying. Larvae feed for 7-10 days. Older larvae migrate down the plant to pupate. Pupae are often found clustered along leaf veins on the undersides of leaves. Adults emerge from pupae in 6 days. Adults can eat 150-640 whitefly eggs or 11 large larvae per day. A single beetle can consume as many as 10,000 whitefly eggs or 700 larvae during its lifetime. Both adults and larvae feed on whitefly eggs and immature stages. If food is scarce, they will also feed on other small arthropods, such as spider mites and aphids, and will cannibalize their own species.

### MONITORING TIPS:

Use a headband magnifier or 10-15X hand lens. The predators are usually easy to tell from their prey, which are slow moving. Adult mites often hide under leaf hairs and along the edge of leaf veins. They are most easily seen on parts of the leaf where spider mite numbers are low or around the edges of the main spider mite infestation. Eggs are usually found singly or in pairs in crevices along, or partly under, the leaf midrib or where prey is abundant.

For more information, Please contact **Sound Horticulture**

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### **PRODUCT INFORMATION:**

*Delphastus* are sold in small containers of 100-500 adults. They are shipped in shredded paper or other packing material to protect them during transport. Mortality in these containers should be less than 10%.

Once the beetles warm up they become active immediately, and therefore should be released as soon as possible. If necessary, beetles can be stored for 1-2 days at 50-61°F (10-16°C), but longer storage will reduce egg laying.

### **INTRODUCTION RATES:**

Introduce *Delphastus* in whitefly-infested areas of the greenhouse as soon as whiteflies are detected.

#### General Introduction Rate:

Release at least 100 adults/whitefly "hot spot", or 10 adults/infested plant, weekly, for 3-4 weeks.

#### Greenhouse Cucumber, Pepper and Tomato:

- Low Rate: use general rate (above), or 0.05 beetles per square foot, bi-weekly, for 3 weeks.
- Moderate Rate: 500 *Delphastus*/whitefly hot spot; or 0.1-0.2 beetles per square foot, weekly, for 4 weeks.
- High Rate: 500 *Delphastus*/whitefly hot spot; or

0.3-0.4 beetles per square foot, weekly, until established in all infested areas.

#### Tropical Plantscapes:

- Low Rate: use general rate (above) or 0.05 beetles per square foot, bi-weekly, for 3 weeks
- Moderate Rate: 500 *Delphastus*/whitefly hot spot, weekly, for 4 weeks.
- High Rate: 500 *Delphastus*/whitefly hot spot, weekly, until established in all infested areas.

### **FOR BEST RESULTS:**

Best results are achieved when *Delphastus* is used together with whitefly parasites. (See *Encarsia* & *Eretomocerus*.) *Delphastus* do not survive in the absence of prey, therefore should be released only after whiteflies are detected. Check for *Delphastus* when de-leaving or pruning leaves from infested plants. Keep any leaves with *Delphastus* pupae in the greenhouse until adult beetles have emerged. Use *A. cucumeris* along with other thrips predators such as *Orius* spp. (see *Orius*) on flowering plants and *Stratiolaelaps* (formerly called *Hypoaspis miles*) to control thrips pupae in the growth media (see *Stratiolaelaps*).

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