



Delphastus catalinae Whitefly Predator

PO Box 1555, Ventura, CA 93002
800-248-2847 * 805-643-5407 * fax 805-643-6267
questions bugnet@rinconvitova.com
orders orderdesk@rinconvitova.com
web www.rinconvitova.com

The Whitefly Predatory Lady Beetle, *Delphastus catalinae*, is being used in greenhouses mainly for control of sweetpotato whitefly. Initial studies show *Delphastus* is most effective at high whitefly densities, best used as an inoculation in greenhouses in combination with other biological controls.

Target Pests

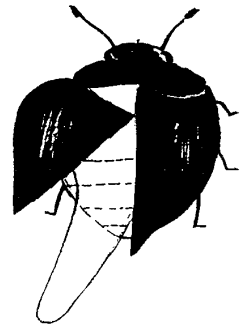
Greenhouse whitefly (*Trialeurodes vaporariorum*)
Banded-winged whitefly (*Trialeurodes* spp.)
Sweetpotato whitefly, silverleaf whitefly (*Bemisia* spp.)
Woolly whitefly (*Aleurothrixus floccosus*)
Azalea and hibiscus whitefly (*Pealius* spp.)
Cloudywinged, citrus and Rhododendron whitefly (*Dialeurodes*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

Description

Delphastus is a native predatory coccinellid beetle often found associated with high populations of various species of whitefly.

- Adults are tiny, 1.4 mm (1/15 inch) 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 pupae are more yellow and spherical.

The adult beetles fly, while larvae are slow moving and travel from plant to plant on leaves. Adults are most noticeable at twilight and on cloudy days. Beetles bite through the whitefly integument of all stages of whitefly and extract the contents leaving collapsed integument behind.



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 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.
- 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 diapause. In mild winters, they will survive medium frosts. Prolonged temperatures below freezing will kill them.
- Low light levels and low temperatures slow down the reproductive rate, but they will still cycle

Monitoring Tips

Inspect the undersides of leaves in whitefly "hot spots" for all stages of beetles.

- Three weeks after the first introduction, expect to see larvae and pupae on the underside of leaves.
- Delphastus prefer eggs. The first place to scout for Delphastus is in the growing tips, where the whiteflies are laying their eggs. Look for them 4-5 weeks after introduction.
- Two months after the first introductions, all stages of Delphastus should be present in the oldest whitefly infested areas.
- Feces (watery or pasty yellowish deposits) are a sign of feeding activity.

Life Cycle

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

- Eggs are yellowish ovals, laid on 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 mite and aphids, and will cannibalize their own species.

Product Information

Delphastus are sold in small containers of 100 or 1,000 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, 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. Preventive rate is 100 per 2.5 acres (1 hectare), every 2 weeks.

Greenhouse cucumber, pepper and tomato:

- Low Rate: use general rate (above), or 0.5 beetles/m² (10 ft²), bi-weekly, for 3 weeks
- Moderate Rate: 500 Delphastus/whitefly hot spot; or 1-2 beetles/ m², weekly, for 4 weeks.
- High Rate: 500 Delphastus/whitefly hot spot; or 3-4 beetles/ m², weekly, until established in all infested areas.

Tropical Plantscapes

- Low Rate: use general rate (above) or 0.5 beetles/m² (10 ft²), 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 (for information on Encarsia; or Eretomocerus.
- Green lacewing can be released at low whitefly densities before Delphastus inoculations allowing a generation or two of lacewing to manage pests early. Lacewing larvae may eat beetle eggs if plentiful relative to plant-feeding host foods, such as whitefly, aphids and mealybugs.
- Delphastus do not survive in the absence of prey, therefore should be released only after whiteflies are detected.
- Check for Delphastus when de-leafing or pruning leaves from infested plants. Keep any leaves with Delphastus pupae in the greenhouse until adult beetles have emerged.
- Release the Delphastus at sundown on the day they arrive. Ideally, inoculate when there are less than six whitefly immatures per leaf with temperatures between 65-90° F. Adults tolerate 45° to 105° F

Using Pesticides

For effects of specific pesticides on Delphastus see the pesticide toxicity sheet.

- Broad spectrum and systemic insecticides are toxic to Delphastus.
- Spreader-stickers and wetting agents may harm the beetles on contact, but do not have residual effects.
- Insecticidal soap and kinoprene (Enstar®) may be used in whitefly hot spots, however, reducing whitefly numbers with pesticides also reduces the beetle's food supply and reproductive ability.