

Bean Leafroller, *Urbanus proteus* (Linnaeus) (Insecta: Lepidoptera: Hesperiiidae)¹

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The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

The larva of bean leafroller, *Urbanus proteus* (Linnaeus), is a common, late summer pest of beans, and occasionally soybeans. It is especially common in home gardens and on some weeds, particularly Dixie tick trefoil (*Desmodium tortuosum*). If bean leaves are rolled, or leaf edges look ragged, check for bean leafroller larvae. The adult, a longtail skipper, is commonly seen feeding on nectar of flowers.

Distribution

The range of the bean leafroller includes the southern United States and all of Mexico, Central America and the Caribbean, and South America south to Argentina.

In the United States, the bean leafroller is found throughout Florida and in coastal areas from South Carolina west to eastern Texas. It annually invades (extends its range) to most of the southeastern states, and regularly invades the southernmost areas of the southwest US. However, this species cannot tolerate prolonged freezing temperatures, and in the United States it persists only in the southern coastal plain, perhaps only in southern Florida.

Description

Adult

The bean leafroller adult is fairly large, measuring about 50 mm (2 in) in wingspan. The most pronounced feature is the prolonged extensions, or “tails,” of the hind wings. As a result of these extensions, the adult butterfly is commonly known as the “longtail skipper.” The forewings and hind wings are chocolate brown dorsally and pale brown ventrally. The forewings also are marked with five to seven square or rectangular spots, white above and light brown below. Green iridescent scales are present on the wings and body.



Figure 1. Adult bean leafroller, *Urbanus proteus* (Linnaeus).
Credits: Jim Castner, UF/IFAS

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Figure 2. Adult bean leafroller, *Urbanus proteus* (Linnaeus).
Credits: Don Hall, UF/IFAS

Egg

The eggs of the bean leafroller are deposited singly or in small clusters of two to six eggs on the lower epidermis of foliage. Initially the eggs are white in color, but soon turn yellow. The egg is a slightly flattened sphere, and measures about 1 mm ($\frac{1}{32}$ in) in diameter. Eggs hatch in three to four days.



Figure 3. Eggs of the bean leafroller, *Urbanus proteus* (Linnaeus).
Credits: L. J. Buss, UF/IFAS

Larva

There are five larval instars, and 15 to 20 days are required for the larval stages. Initially the larva is yellowish with a brownish-black head and prothoracic shield. The head is quite large relative to the body and remains this way throughout development. With the molt to the second instar the dorsal surface of the insect becomes marked with numerous small, black spots. Beginning with the third instar, lateral yellow lines become quite distinct. The last two instars are similar to the preceding: brownish-black head, black prothoracic shield, yellowish body sprinkled with black spots but lighter below, and yellow lateral lines. Also evident are orange spots on the head near the base of the mandibles, and red on the ventral portion of the thoracic segment. The body tapers sharply toward both the anterior and posterior ends.



Figure 4. First instar larva of bean leafroller, *Urbanus proteus* (Linnaeus), measuring only 4.5 mm (about $\frac{3}{16}$ inch) in length.
Credits: L. J. Buss, UF/IFAS



Figure 5. Mature larva of bean leafroller, *Urbanus proteus* (Linnaeus).
Credits: L. J. Buss, UF/IFAS

Pupa

The larva pupates on the plant, within the shelter formed by the larva from leaf material. The pupa measures about 20 mm ($\frac{3}{4}$ in) in length. The pupa is yellow to brown and is covered by a bluish-white pubescence. Duration of the pupal stage is seven to 20 days.



Figure 6. Prepupa of bean leafroller, *Urbanus proteus* (Linnaeus). This is the end of the caterpillar stage but it is beginning to thicken and shorten as it prepares to transform into a pupa.
Credits: L. J. Buss, UF/IFAS



Figure 7. Pupa of the bean leafroller, *Urbanus proteus* (Linnaeus).
Credits: L. J. Buss, UF/IFAS

Life Cycle

The bean leafroller can complete its life cycle in about 30 days. It breeds in southern Florida throughout the year, but is relatively infrequent in northern Florida until June, and only becomes abundant late in the season, usually September–October. In Florida, large numbers of adults are frequently observed migrating southward in the autumn. They make a similar northward migration in the spring and summer, but it is less apparent.

Hosts

The bean leafroller larva feeds on legume crops such as cowpea, lima bean, pea, snap bean and soybean. It is also known from wisteria, *Wisteria* spp.; tick trefoil, *Desmodium* spp.; butterfly pea, *Clitoria* spp.; and hog peanut, *Amphicarpa bracteata*.

Damage

Larvae are defoliators, feeding only on leaf tissue of legumes. Initially the larva cuts a small, triangular patch at the edge of the leaf, folds over the flap, and takes up residence within this shelter. The larva leaves the shelter to feed, and lines the shelter with silk. These flaps are used until the third or fourth instar, when the larva constructs a larger shelter formed by folding over a large section of the leaf by webbing together two separate leaves. Again, the leaf fold is used for shelter, the larva leaving to feed. Larvae feed nocturnally.



Figure 8. Bean leafroller, *Urbanus proteus* (Linnaeus), leaf damage.
Credits: L. J. Buss, UF/IFAS

Management

Sampling

Populations are normally sampled by visual observation because the larvae are sheltered within leaf folds and difficult to dislodge by sweeping, and because the leaf damage caused by shelter-building activity is readily apparent.

Action Threshold

Larvae consume about 190 sq cm (29.5 sq in) of foliage during their development. Beans can tolerate up to about 30 percent leaf loss without reduction in yield, so about four larvae must complete their development on a “typical” bean plant with 2175 sq cm (2.3 sq ft) of foliage to inflict a damaging level of defoliation. Because about one-half of the individuals perish in each life stage, densities of 140 eggs or 70 first instar larvae per plant must occur to cause damage.

Chemical Control

Most insecticides applied to the foliage are very effective for leafroller suppression. This should only be necessary for late-season bean crops. The microbial insecticide *Bacillus thuringiensis* currently is not recommended.

Biological Control

In Florida, *Chrysotachina alcedo* (Loew) (Diptera: Tachinidae) was reared from larvae, and predation was observed by a *Polistes* spp. wasp (Hymenoptera: Vespidae) and (Linnaeus) stink bugs (Hemiptera: Pentatomidae). Also, a nuclear polyhedrosis virus was found to infect and kill up to 40 to 50 percent of larvae late in the season when larvae were numerous.

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