

Boxwood Leafminer

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Boxwood leafminer (*Monarthropalpus flavus* Schrank) came to North America in the 1800's with the introduction of boxwood (*Buxus* spp.) to the continent. Considered the most serious insect pest of boxwood, the insect occurs essentially wherever boxwood are planted and all boxwood varieties are attacked. Boxwood leafminer is a fly (order Diptera) of the family Cecidomyiidae, a fly family commonly known as gall midges or gall gnats, and only has one generation per year.

Description

Eggs are white to transparent. Larvae are small (a few mm in length) and off-white to lemon colored. Adults are very small (only a few mm in length) and orange-red, gnat-like flies.

Lifecycle

Immature larvae overwinter in the excavated blisters of infested leaves. In the early spring, larvae molt into a resting pupal stage and develop into adults. At adult emergence, the pupal skin is forced partly out of the mine, where it hangs for several days after the fly emerges (Figure 1). Adults are active for approximately two weeks after boxwoods begin adding new growth in the spring. Adults will mate soon after emergence and mated females will deposit eggs into new foliage by piercing the lower leaf surface with a curved, needle-like ovipositor and placing the egg inside the leaf. Eggs deposited inside foliage can be seen if the leaf is held up to the light. Females lay an average of about 30 eggs and then die. The eggs will remain in the leaf where they will hatch after two-three weeks. Hatched larvae will then begin feeding and continue to do so through the summer.

Damage

Boxwood leafminer larvae are physically located within leaves where they feed on a spongy layer of

Figure 1: Shed pupal skins left behind after adult flies emerged



Figure 2: Beginning symptoms of leafminer damage on upper (top) and lower (bottom) leaf surfaces



tissue called the mesophyll. This layer is located between the upper and lower epidermis of the leaf and is where the bulk of photosynthesis occurs. This mining results in the formation of small blisters on the undersides of leaves (Figure 2)

which can be seen around late-spring/early-summer. Continued feeding through the season will later result in larger blister wounds (Figure 3). Infested leaves become yellow and smaller than uninfested leaves. With chronic infestation, shrubs can become unsightly with premature leaf drop, poor or stunted growth and thinning foliage. Finally, stems die and the shrub becomes severely weakened and susceptible to diseases and abiotic stress such as extreme cold, excessive heat, or lack of water.

Management

All boxwoods are attacked by boxwood leafminer. However, slow-growing varieties of European (aka English) boxwood (*Buxus sempervirens*) are known to have fewer infestation issues than other varieties. Boxwood leafminer has a few known natural enemies, such as the parasitoid wasp *Cirrospilus coachellae*, that occasionally prey on the leafminer, but not to a degree that would eliminate an infestation. However, preventative and therapeutic treatments are available to aid in the management of boxwood leafminer. Please contact your Bartlett Arborist Representative to learn about management strategies.

Figure 3: Later symptoms of leafminer damage (lower leaf surface)



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