



# BUG BIZ

Pest Management and Insect Identification Series



## The Alligatorweed Flea Beetle

Scientific name: *Agasicles hygrophila* Selman and Vogt (Insecta: Coleoptera: Chrysomelidae)

### Introduction

The South American invasive wetland plant, alligatorweed (*Alternanthera philoxeroides* (Mart.) Griseb., Figure 1) has been in the United States for at least 100 years and in Louisiana since the early 1900's. With few limiting factors in the United States, alligatorweed quickly spread, growing aggressively in most locations where it was introduced. As of 2015, alligatorweed has been reported in 16 states (Figure 2). In 1960, surveys by the U.S. Department of Agriculture began in South America to search for alligatorweed-feeding insects that could be used to provide control in the United States. Several insects were identified but one in particular, the alligatorweed flea beetle (*Agasicles hygrophila*), was ultimately imported from Buenos Aires, Argentina and released into locations where alligatorweed was problematic.

The alligatorweed flea beetle was introduced into Louisiana in 1970. After initial releases near Lake Charles in 1970, beetles were collected from established populations and relocated onto alligatorweed infestations in other parts of the state. The flea beetle has provided such satisfactory control that, in most southern states, alligatorweed is no longer considered to be a problem culminating in reduced dependence on herbicide management.



Figure 1. Alligatorweed infestation in the Blind River, La. Photo by Nathan Harms.

### Distribution

The alligatorweed flea beetle is widely distributed in the southeastern United States and in many countries where it has been intentionally introduced for biological control. The spread and effectiveness of the alligatorweed flea beetle has been mainly limited to areas where average winter temperatures stay above 52°F; in Louisiana this roughly corresponds to areas south of Alexandria. The alligatorweed flea beetle disperses long distances by flying and populations can be found in northern parts of the state. These insects generally aren't observed until later in the season.

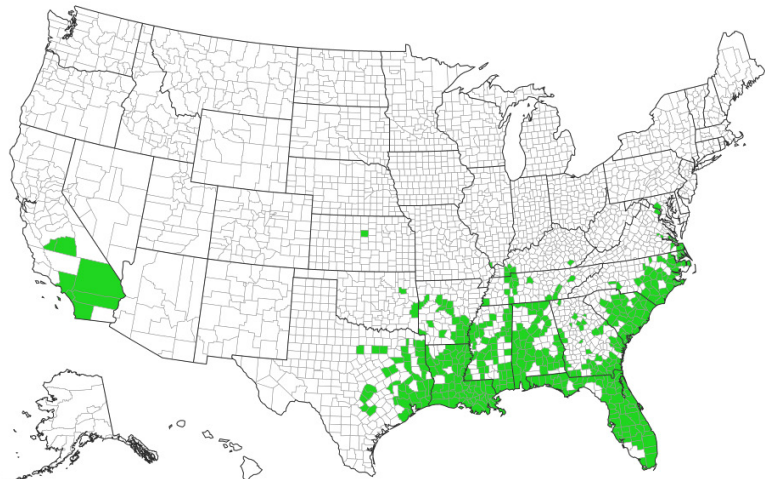


Figure 2. County-level distribution records of alligatorweed (*Alternanthera philoxeroides*) in the U.S. (Source: EDDMaps.org).

### Description

**Adults:** Alligatorweed flea beetle adults are a small, 0.16" - 0.24" long, black and yellow leaf beetle (Figure 3). This insect can be distinguished from

similar-appearing beetles by yellow stripes on its elytra (wing covers) and a solid black thorax. Its common name is derived from the behavior exhibited by adults to jump or fly when startled. Adult flea beetles feed on the leaves and stems of alligatorweed, creating characteristic “shot” holes in the leaves. Female flea beetles lay an average 1,127 eggs during her lifetime, and adults live for an average of 48 days.

**Eggs:** Females oviposit eggs in clusters of 12 to 54, in two rows, on the underside of alligatorweed leaves (Figure 4). Eggs are cream to yellow, average 0.05” x 0.01” long, with larval emergence typically occurring within four days.

**Larvae:** Larvae are initially yellow to cream colored but darken as they feed and develop (Figure 5). Larvae, depending on development stage, range in size from 0.047” – 0.24” long. Immature flea beetles feed primarily on the underside of alligatorweed leaves, creating a “window paining” effect. Later instar larvae chew holes in the hollow stem of alligatorweed then crawl inside for pupation (Figure 6).

**Pupae:** Pupae are cream colored and average 0.19” long. After pupation, adult flea beetles chew an exit hole in the stem and emerge to feed and mate. The pupal stage lasts around five days.

## Life Cycle and Ecology

The alligatorweed flea beetle overwinters in the adult life stage resulting in continuous feeding throughout the winter months. For this reason, the beetle performs better in areas with a mild winter climate including coastal locations. In areas south of Alexandria, the flea beetle typically becomes active in March to April and can be found through late fall, though they may be difficult to locate when alligatorweed becomes scarce. In areas north of Alexandria, flea beetle presence is less predictable and depends largely on the severity of the preceding winter and distance from southern locations with established beetle populations. Control by the beetles often is highest when plants are growing in high nutrient environments, and can lead to total defoliation (Figure 7). There is evidence that alligatorweed flea beetles are able to choose host plants with the highest nutritional quality for feeding and oviposition.

## Host Plant

Extensive laboratory experiments and field observations demonstrated that the alligatorweed flea beetle feeds only on alligatorweed.

## Availability

The alligatorweed flea beetle is not commercially available. However, the beetles are easily collected from infested alligatorweed patches with a muslin sweep net which is similar to a heavy-duty butterfly net. Additionally, flea beetle egg masses can be collected from infested sites and moved to areas where the beetles aren’t found. When looking for egg masses, focus on upper, underside leaves of the plant. Early in the season (March-April), it is possible to find several egg masses on a single leaf.

## Economic Importance

The economic importance of the alligatorweed flea beetle to Louisiana has not been determined. However, Andres (1977) discussed



Figure 3. Adult *Agasicles hygrophila*. Photo by Graham Montgomery, BugGuide.net.



Figure 4. Eggs of the alligatorweed flea beetle on the underside of an alligatorweed leaf. Photo by Nathan Harms.



Figure 5. An alligatorweed flea beetle adult and larvae. Photo by Gary Buckingham, USDA Agricultural Research Service, Bug-wood.org.

the overall cost savings attributable to the successful biological control of alligatorweed to the U.S. The savings incurred from successful control of alligatorweed in Louisiana have likely been offset by problems of other invasive species, such as water hyacinth (*Eichhornia crassipes*) and giant salvinia (*Salvinia molesta*). In areas where alligatorweed and other noxious weeds are no longer a problem, savings come from the decreased need for herbicides and increased accessibility to fishing and hunting sites.

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Figure 6. Entrance (smaller) and exit (larger) holes created by alligatorweed flea beetle larvae and adults. Photo by Nathan Harms.

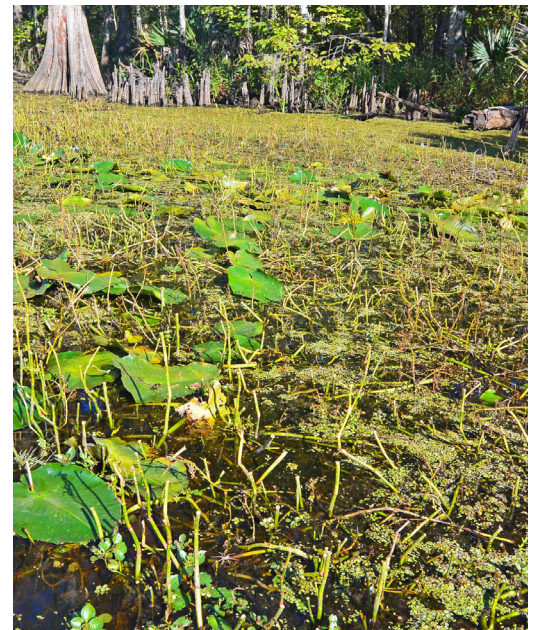


Figure 7. Emergent alligatorweed stems defoliated by the alligatorweed flea beetle in the Blind River, La. Photo by Nathan Harms.

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