

FIREFLIES AND PESTICIDES: Just the facts

Are fireflies declining?

To date, no scientific studies have shown a decline in fireflies. Most of the support behind this claim is anecdotal (based on personal beliefs, rather than facts or research). The only long-term study of firefly populations (conducted in Japan), showed that firefly populations vary from year to year and are heavily influenced by weather. In fact, we know very little about how populations of any given species of fireflies have changed over time. Therefore, we cannot say with any certainty that firefly populations are actually in decline.

The facts: we don't know if fireflies are declining

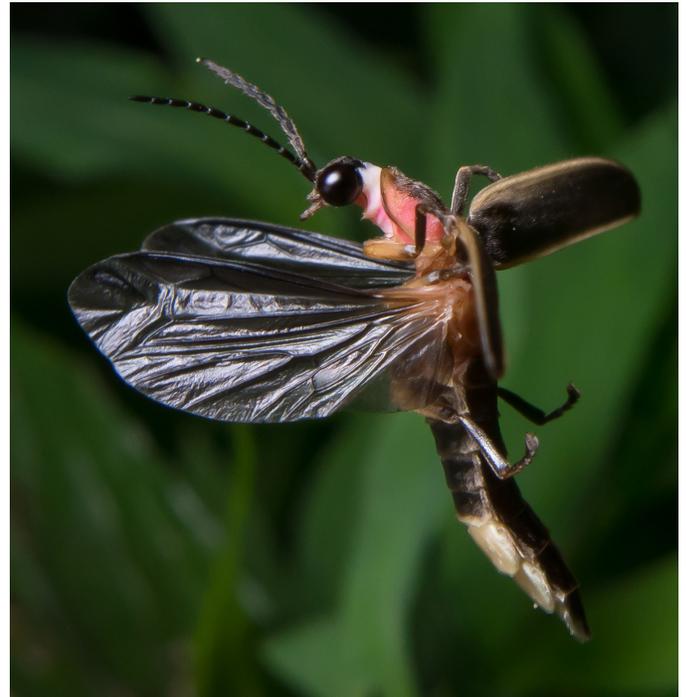
The only facts we have about firefly populations is that there are going to be year-to-year differences due to factors such as weather patterns. Several studies have shown that extreme weather, such as drought or heavy flooding, can greatly affect numbers of fireflies in any given year. Although we do not have the data to support a population decline, many citizen-science organizations are in the process of collecting national data and can hopefully use that information to understand future populations.

Are pesticides killing fireflies?

No scientific data support the claim that pesticides are killing fireflies. Although many websites will insist there is a link, no studies have supported this position. To date, only six studies around the globe have looked at the effects of pesticides on fireflies. None of these studies was able to show that fireflies in nature would be adversely affected by pesticides.

The facts: Mosquito control is probably not killing fireflies

No scientific data support the theory that mosquito control is killing fireflies. To date, only two studies have looked at mosquito control based insecticides, and both studies showed no harmful effects of these products on fireflies. These included a study showing that truck-based control of flying mosquitoes did not kill fireflies exposed to the spray. In addition, a study looking at control of immature mosquitoes showed that immature fireflies were not adversely affected by these control products. Therefore, no scientific evidence documents that these pesticides are killing fireflies.



Why are so few fireflies in my backyard this year?

Many factors contribute to yearly and seasonal variations in firefly populations. These may include:

- Weather conditions (drought, heavy rainfall, temperature).
- Availability of food (fireflies are predators).
- Availability of habitat (most species prefer moist environments, with ample places to protect themselves during the day).

The facts: Year-to-year firefly population variation is normal

The fact is that firefly populations are going to vary from year to year. In a 31-year study of firefly populations in Japan, the authors documented that firefly populations fluctuated annually. They attributed these fluctuations to extreme weather conditions, such as drought and heavy flooding. Citizen-science pages, which have been collecting data for over 10 years, also show that yearly population variation is normal.

Firefly biology

Fireflies are not flies at all, and, in fact, they are an incredibly diverse group of beetles. Over 2,000 species populate the world, with more than 170 species in the U.S. alone.



Fireflies spend most of their lives as immature beetles (some that glow are called glowworms). It actually takes 1 to 2 years for a firefly to grow from egg to adult. During that time, the immatures will feed on a variety of small insects, snails, earthworms and other food sources (some species are known to eat plants and fruits). Before becoming an adult, fireflies often build chambers underground where they spend a period of time resting (as pupae). When adults emerge, they are short-lived, living only 2 to 8 weeks depending on species.

The facts: Fireflies are a diverse group of beetles

The fact is we know very little about the biology of fireflies. Of the 2,000 species worldwide, only a handful have been studied in any great detail.

Although some features of the biology are the same, not all fireflies are alike. In fact, some species luminesce (emit light), while some do not. Some species live in water, while some prefer humid habitats under leaves. Some are active in June, while some are active in August. Therefore, much more research on individual species is needed to truly understand how these populations change over time.

About

Information for this brochure was the result of an extensive literature review conducted by 11 individuals (faculty, postdocs and students) at the LSU AgCenter Department of Entomology. Our goal was to be as comprehensive as possible, without biasing our results.



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