

FAQ

Where does giant salvinia come from?

Giant salvinia (*Salvinia molesta*) comes from South America, mainly Brazil and Argentina. It likely came to the United States via the aquatic plant trade.

Why is giant salvinia a problem?

Giant salvinia forms dense mats that can clog waterways and prevent the passage of sunlight into the water. This affects any kind of boating activities such as duck hunting and fishing, and also reduces the amount of dissolved oxygen in the water, which can have negative consequences for fish, native plants, and waterfowl.

Does giant salvinia flower or produce seeds?

No. Giant salvinia is a type of fern, so it does not flower or produce seeds. The plants are sterile and only reproduce by budding or fragmentation.

How can giant salvinia be controlled?

Herbicides and biological control using the salvinia weevil are two of the most efficient control methods for giant salvinia. Other methods are mechanical removal, either by hand or machine, and water level drawdowns. Beware of mechanical mowers that shred plants, as these can promote new bud growth from fragmentation. Drawdowns can be effective if done correctly, but they require enough time for all of the plants to dry out completely, and often leave wet areas that cannot be drained entirely.

Can giant salvinia be eradicated?

It is highly unlikely that giant salvinia will be eradicated. Because it is so widespread, it would be nearly impossible to kill or remove every single plant. Only a small amount of plant material is needed to start a new infestation.

How do I know if I have giant salvinia?

Giant salvinia can be easily recognized by its floating, light green fronds and egg beater-shaped trichomes (leaf hairs). It may be confused with common salvinia (*Salvinia minima*), a related species which has smaller leaves and forked trichomes that are not fused at the tip. Giant salvinia is sometimes confused with species of duckweed, but it has much larger leaves and many hydrophobic trichomes. Correct identification is extremely important to successful control.

What is the LSU AgCenter doing to control giant salvinia?

The LSU AgCenter conducts research on giant salvinia control methods including herbicides and biological control using the salvinia weevil. Currently the LSU AgCenter manages several salvinia weevilrearing ponds that are used to supply weevils to the Louisiana Department of Wildlife and Fisheries (LDWF) for statewide distribution.

Where does the salvinia weevil come from?

The salvinia weevil (*Cyrtobagous salviniae*) comes from giant salvinia's native range in South America. The weevils we have here are originally from Brazil and came by way of Australia in the early 2000s.

What is the salvinia weevil life cycle?

Adult salvinia weevils lay eggs during warm parts of the year (typically March-October) in giant salvinia buds or rhizomes. Larvae hatch in about 10 days and begin to feed on the plant, eventually burrowing inside it. The larvae will begin to pupate in the plant's underwater "roots" (actually modified leaves) about 23 days after hatching and emerge as adults 10-15 days later. Adults may begin to mate and lay eggs 5 days after emergence, and can continue to reproduce for several months. Reproduction stops during the winter months, when adults overwinter and commence egg laying in the spring. Development from egg to adult takes about 45 days, and several generations can occur in one season.

How do salvinia weevils control giant salvinia?

Adult salvinia weevils feed on young leaves and buds of giant salvinia, which inhibits new plant growth. As the larvae burrow and feed inside the rhizome, they disrupt the flow of nutrients from the roots to the leaves, causing the plant to turn brown and sink. A sufficient density of salvinia weevils can effectively clear a water body of giant salvinia in a period of months to years.

Will the salvinia weevil eat anything other than giant salvinia?

Even if they run out of food, salvinia weevils will not move onto crops or garden plants. Extensive research has shown that salvinia weevils can only survive and complete their life cycle on members of the genus *Salvinia*. In the U.S., this includes giant salvinia (*Salvinia molesta*) and common salvinia (*Salvinia minima*). There are no native North American plants in the *Salvinia* family, making the salvinia weevil an extremely safe agent for biological control.

Will salvinia weevils control common salvinia as well as giant?

In Louisiana we have two biotypes of the salvinia weevil, one that specializes on giant salvinia and one that specializes on common salvinia. Even though they are the same species, each biotype differs slightly in size and host plant preference. Weevils of the giant salvinia biotype will feed on common salvinia, but may not proliferate on it due to its comparatively small size. For this reason we do not recommend releasing weevil-infested giant salvinia into common salvinia infestations.

What happens to the salvinia weevils after all the giant salvinia has died?

If no other giant salvinia plants are nearby, the weevils will probably die along with their host plant. However, small amounts of giant salvinia are typically still present even after the majority has died, and these can serve as refuges for the weevils until they encounter more salvinia plants. The salvinia weevil population will tend to track giant salvinia's yearly growth cycle, increasing from spring to summer when plants are actively growing and decreasing over winter.

What happens to salvinia weevils in the winter?

Salvinia weevil eggs and larvae cannot survive below 62°F, so adults must overwinter until spring temperatures allow them to commence egg laying. Adults overwinter on surviving salvinia plants and can feed when temperatures are above 55°F. When temperatures drop, adults typically cling to the plant's underwater fronds where they are less exposed to the elements. Salvinia weevil adults can survive short periods of below zero temperatures but are at high risk of mortality if ice forms.

Can salvinia weevils fly?

Yes, salvinia weevils are capable of flying short distances during certain times of the year. However, they seem to be weak fliers. Their primary means of dispersal is by walking across plants or floating on plants as they are carried by water currents.

How do I know if I have salvinia weevils?

The only way to be sure is by monitoring the salvinia infestation. An easy method is to check new buds for signs of weevil feeding damage. Damaged growing tips will have a chewed appearance with small holes or leaf scars. Large holes accompanied by frass (insect droppings) are likely caused by the *Samea* moth and not weevils. Photos of weevil damage are available in the [LSU Bug Biz Series](#). Weevil presence may also be determined by Berlese extraction of plant material. For more information on weevil population monitoring see our guide (soon to come), [How to Release and Monitor Salvinia Weevils for Biological Control of Giant Salvinia in Louisiana](#).

How are salvinia weevils reared?

The LSU AgCenter manages several outdoor rearing ponds. These ponds are constructed for ease in monitoring the weevil population over time. The ponds are fertilized to promote healthy giant salvinia growth and managed for pests including fire ants and *Samea* moths. Weevils are stocked year-round and harvested a few times each year. For more information see our guide, [How to Rear Giant Salvinia Weevils in Outdoor Ponds](#).

Does giant salvinia biocontrol work?

Weevil-infested giant salvinia plants are released into the middle of giant salvinia infestations and allowed to spread as the weevil population grows. Over time, the weevil population will catch up with the giant salvinia and prevent further spread, then eventually kill the plants. In southern LA, giant salvinia biocontrol has been very effective, and results can be seen as early as three months after the weevil population reaches an adequate density. However, it can take several years and multiple release attempts before the weevil population reaches this level. For this reason, biocontrol has had less success in north LA, where weevil establishment has been hindered by cold winter temperatures.

How can I get salvinia weevils?

Currently the LSU AgCenter's weevils are provided to the Louisiana Department of Wildlife and Fisheries (LDWF), and distributed statewide to various organizations. Weevils may be available to the public on a limited basis - for more information, contact Dr. Rodrigo Diaz (RDiaz@agcenter.lsu.edu), Korey Pham (KPham@agcenter.lsu.edu), or Logan Herbert (LHerbert@agcenter.lsu.edu).

How many weevils do I need to release?

This depends on the size of the infestation, time of year, and desired timeframe of control. Typically, one 20-gallon tote containing adults, pupae, eggs, and larvae is released per site, with sites being spaced at least 100-200 feet apart. Material used to fill the totes is harvested when the weevil population density is around 30 adults per pound. It is important to continue to monitor release sites to determine if the release was effective, or if more releases are needed. Knowing the size of the weevil population is important for guiding future management decisions.

When and where should weevils be released?

The best time to release weevils is in the spring, before the giant salvinia has had a chance to reach its rapid growth stage. This way, the weevils have the best chance of keeping up with the rate of infestation. Releases should be made in locations with steady water levels and plenty of direct sunlight, as these promote the best plant quality. Weevils should be released into green, healthy plants with plenty of new buds. It is important to confirm that giant salvinia is present prior to making releases! Otherwise, releasing weevil-infested material could potentially inoculate giant salvinia into a water source that previously did not have any (for example, if only common salvinia is present).

How soon will I see results?

Biocontrol can take months to years before results are visible. The weevil population needs time to grow and expand to cover the giant salvinia infestation. This is dependent on the size of the infestation, number and size of the releases, and location. As a rule results will be faster further south, where temperatures are warmer and the weevils can develop faster. It is important to continue to monitor release sites regularly so that necessary actions including supplemental releases may be made.

Can I use other control methods in addition to weevil releases?

Effective biological control requires patience. However, an integrated approach can be beneficial to controlling giant salvinia while the weevil population establishes. Herbicides and mechanical removal can be used at the same time as biological control, as long as the weevils are undisturbed. The best approach is to target removal zones away from weevil release sites. Keep in mind that large patches of sinking giant salvinia can cause a temporary reduction in dissolved oxygen, which may be harmful to fish and other freshwater animals. For this reason applying herbicide in strips or small patches is preferable to applying over large areas. Small areas with weevils can be protected during cold fronts with row cover, which can protect weevils from cold exposure and reduce mortality.