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**Dragonflies: The Ultimate Mosquito Control**

Dragonflies are the most voracious eaters of mosquitos we have. With all this consistent rain and flooding, we know that mosquitos are currently breeding and increasing in population. Don’t think that bird species like purple martins and flycatchers are going to be much help, they are after bigger prey. The real predator of mosquitos is the agile and fast dragonflies (and their close cousin, the damselfly). You’ll need to create a habitat in which they can reproduce to attract this insect to your landscape. However, unlike the habitats of many other beneficials, the one for dragonflies is entirely aquatic.

Where they live

Dragonflies spend the majority of their immature life in ponds and streams as aquatic invertebrates. In this nymph stage, they don’t look much like dragonflies, but they are still savage eaters of mosquito larvae and pretty much anything they can catch. Some dragonfly nymph species are powerful enough to take down small minnows even bigger than they are. Effectively, they are the spiders of the aquatic world, but instead of webs, they chase down their prey with jets of water and lightning-fast mandibles. Once ready, the nymphs will crawl out of the water on some type of vegetation and molt, creaking open their skin and unfurling their wings. During this process, they are the most vulnerable to birds and other insects. At first, newly formed adults will be colorless and smaller. It will take them a couple of weeks to months before they are full-sized, colored, and ready to reproduce. When you see a dragonfly dipping its thorax into a pond as it flies around, that is a female depositing eggs almost randomly around the pond's surface. Other species of dragonflies and damselflies are more specific in their egg laying.

Creating the right aquatic environment

A backyard pond or water feature can be a great place for dragonfly nymphs to live and attract mosquito-eating adults. However, there are some special characteristics necessary.

* The right size – A small pond can work, but it needs to be at least 40 sq. ft. Most in-ground water gardens are going to be about this size or bigger.
* The right depth – The nymphs will need shallow water, about 6” to 1’ during the cooler months and 2’ to 3’ during the summer months. These depths will also keep some of it from freezing during the winter.
* Plenty of sun – Adult dragonflies like to ‘sun’ themselves and prefer sunnier locations in the spring and fall. Nymphs need warmer waters to hunt in.
* A little shade – The nymphs and adults could often do with some shade during the heat of mid-summer.
* No fish – It can be hard to not have goldfish or koi in a backyard water garden, but fish will eat the eggs and nymphs before they are able to defend themselves.
* Plenty of vegetation – Water lilies, cattails, shoreline bushes, the specific species doesn’t matter. It just needs aquatic stuff for nymphs to hide in and adults to land on. Ideally, 50 to 60% of the water surface will be covered with a mix of emergent, floating, and submerged plants.

There are lots of ways of creating water features. In this area, we have enough clay in our soils that a small pond can be dug and compacted without the need for a plastic liner. However, extra effort will be needed in some locations. Supplemental water could be needed at times for smaller water features and a big rain-water barrel reserve is ideal for this.

Improving an existing pond will involve increasing the plant's biodiversity. Good chance it already has fish in it, so the focus will be on creating places where nymphs can hide. Of course, aquatic plants can help, but if you don’t want to introduce such things into your fishing pond, then shoreline bushes can help. Some species of bushes do well in pond-side environments. In any case, a good fishing pond ideally has a shallow area with vegetation for feeder fish to survive and will be good for dragonflies too. A few trees that allow for dapple sunlight can help keep the water cooler for fish and dragonfly nymphs, and will also help keep the algae down. Note, never plant large trees on the pond dam because bigger roots can break the dam over time.

Once you have your water feature or pond, it won’t take long before dragonflies start checking it out. The risk of creating a perfect place for mosquito larvae is a concern, to begin with, but other species that eat the larvae (like those little swimming beetles) won’t take long. You might even consider introducing it yourself with some scooped from a nearby pond. Mosquito dunks can be used in the initial short term and technically shouldn’t affect non-true fly (Diptera) species. Frogs that will eat your dragonflies will eventually find your pond too, but that’s unavoidable and all part of the system.

Remember, mosquitos like “temporary” water sources like old tires, ditch culverts, or any place that only has water for a couple of weeks at a time. This is because it only takes a couple of weeks for mosquito larvae to fully grow and pupate. Keeping these sources dumped out or filled in will reduce mosquitos in the town environment. Adding permeant water sources like vegetative ponds and water features will attract the predators that need longer-term aquatic sources for their larvae and nymphs to grow. The agile dragonfly is the greatest of all these predators.

If you have any questions about creating backyard pollinator or beneficial insect environments, give us a call at your local K-State Extension office. The number for Girard is 620-724-8233.

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