

Questions and Answers: Mating Disruption as a Gypsy Moth Management Option



Gypsy moth caterpillar

What is the gypsy moth and why is it a problem?

The gypsy moth is an insect with a big appetite for oaks and other tree species. Each caterpillar can grow up to 2 inches long and can consume 11 square feet of tree leaves during May and June. When abundant, caterpillars will completely defoliate trees. Millions of acres of forests have been defoliated by gypsy moth caterpillars in the Northeast United States. Although healthy trees can survive defoliation, repeated removal of leaves can kill a tree. Older, less vigorous trees suffering from drought can be killed by a single defoliation. Capable of feeding on 500 different kinds of plants, gypsy moth threatens Iowa forests and suburban landscapes.

Gypsy moth caterpillars are also a public nuisance in recreational areas where host trees are prevalent. The great number of caterpillars and the rain of their excrement from treetops can discourage the heartiest hikers and campers from using parks. Some people that come in contact with the caterpillar hairs from shed skins develop skin rashes or allergies.

Where did the gypsy moth come from?

The gypsy moth was introduced to North America in 1869 from Europe in an experiment to improve the silk industry. A windstorm knocked over cages and this insect was accidentally released into Massachusetts's forests. Since that time, gypsy moth has been spreading slowly west and south.

Is gypsy moth in any states near Iowa?

The gypsy moth is slowly spreading across Midwest states of Illinois, Ohio, and Wisconsin. Michigan is considered generally infested by this exotic pest.

How does the gypsy moth move?

Because adult females cannot fly, the natural spread of this exotic pest is when young caterpillars crawl to tree tops to feed and are blown by the wind to new sites. Gypsy moths can be moved long distances when people unknowingly carry them from infested areas as egg masses or cocoons attached to firewood, campers, nursery stock, outdoor furniture, or vehicles. Most of the isolated pockets of infestation in Iowa are a result of this kind of long-distance movement.

How is the pheromone used to detect the gypsy moth?

Traps baited with specific, powerful chemical attractants (called pheromones) for male gypsy moths have been used in Iowa to detect and eliminate pockets of these hitchhiking pests since 1970. Male moths are attracted to the pheromones in small triangular, cardboard, sticky traps placed in a predetermined grid. Multiple catches in a trap signal a potential problem in the area and follow up activities (egg mass surveys, intensive trap placement, and/or eradication) occur. There have been 14 eradication efforts in Iowa between 1989 and 2004; these were isolated, infested nursery stock introductions. A dramatic upswing in trap catches in 2010 from prior years indicated isolated gypsy moth infestations were developing in eastern Iowa. Continued trapping indicated the total moths captured in 2011 through 2018 were much lower than those trapped in 2010, showing that mating disruption is working.

How is gypsy moth pheromone used to control the pest?

When gypsy moth populations are still low, they can be suppressed or eliminated when an infested area is laced with enough pheromone to make it difficult for male moths to find females. This is called mating disruption.

In natural mating situations, the flightless gypsy moth female releases a powerful scent (called a pheromone) to attract males in the area. Mating disruption aerially broadcasts the female gypsy moth pheromone into the infested area. Males confused by the abundance of scent and, being unable to find a female moth, die without producing offspring. Gypsy moth pheromone is produced commercially for use in detection and control programs. Gypsy moth pheromones for this control technique can be applied in two ways: a flaked product (Disrupt II) or using a product consisting of waxy droplets SPLAT® GM-O).

What is Disrupt II?

Disrupt II pheromone flakes are tiny pieces of plastic that have been treated with the gypsy moth pheromone. From ¼ cup to 2/3 cup of flakes is spread by airplane over each acre of infested forest during late June, just before adult moths would normally mate. Disrupt II flakes are placed in the infested area by an aerial application.

What is SPLAT® GM-O?

SPLAT GM-O is an organic, alternative delivery system for gypsy moth mating disruption. It is a biodegradable formulation applied aurally to the tree canopy as small, waxy droplets infused with the pheromone. It is most frequently applied at a rate of less than 8 ounces of product per acre. Made entirely of food grade materials, it is certified under the USDA's National Organic Program.

Will the pheromone products be noticeable in the treatment area?

No. The application rate is so low that the flakes or waxy droplets will be hard to find. Most of the product will stay in the canopy on the tree foliage. If any of the pheromone falls on your car or vinyl siding, the finish will not be damaged.

Are mating disruption treatments dangerous to people or wildlife?

No. These products are non-toxic to humans and animals. The pheromone application will only affect gypsy moth adults; other moths and butterflies will not be harmed.

If mating disruption is so safe, why isn't it used as the only control method for gypsy moth?

Mating disruption is not effective in areas with heavy gypsy moth populations. In these areas, there are enough males and females wandering about that they randomly find each other. In contrast, when gypsy moth populations are low, mating disruption works very well.

For more information on gypsy moths:

Visit Iowa State University Extension and Outreach's Gypsy Moth Website:

<https://www.extension.iastate.edu/psep/gypsymoth.html>

Visit Iowa Department of Agriculture and Land Stewardship's Iowa Gypsy Moth Website:

http://iowatreepests.com/gm_home.html

Contact Iowa State University Extension Entomology at 339 Science II, Ames, IA 50011 or call 515-294-1101

Contact Iowa State University Plant and Insect Diagnostic Clinic at 2445 ATRB, Pammel Drive, Ames, IA 50011 or call 515-294-0581

Contact the State Entomologist Office, 2230 South Ankeny Blvd, Ankeny, IA 50023 or call 515-725-1465

Contact Iowa Department of Natural Resources, 502 East 9th Street, Des Moines, IA 50319-0034 or call 515-725-8453 or 515-249-1732

Contact USDA APHIS Plant Protection Quarantine, 11213 Aurora Avenue, Urbandale, IA 50322 or call 515-251-4083



Male (left) and female (right) gypsy moths