

Mother Earth Farm Green House Outlet
Ruff Creek, PA
www.motherearthfarm.com

Here is a brief explanation of some of the most common questions regarding the biological pest control program at Mother Earth Farm.

Garden Ladybugs - *Hippodamia convergens*



Beneficial garden ladybugs for controlling pests in your garden are the most popular and widely used beneficial insects.

Ladybugs are capable of consuming up to 50 to 60 aphids per day but will also eat a variety of other insects such as, scales, mealy bugs, leaf hoppers, mites, and various types of soft-bodied insects. Ladybugs, also called lady beetles or ladybird beetles, are a very beneficial group of insects. Ladybugs are natural enemies of many insect pests and it has been demonstrated that a single ladybug may consume as many as 5,000 aphids in its lifetime. Ladybug adults have a very characteristic convex, hemispherical to oval body shape. The head is covered by a hood called the pronotum. Many species of Ladybugs are present in North America and they are common in most habitats across the commonwealth.

Q. Why do ladybugs come into my house in the winter time?

A. Ladybugs are attracted to the light colored houses. Especially, homes that have a clear southwestern sun exposure. Older homes tend to experience more problems with aggregations due to lack of adequate insulation. The ladybugs come in through small cracks around windows, door ways and under clap boards. They want to hibernate in a warm, comfortable spot over the cold months of winter. Ladybugs gather in groups when they hibernate, so if you see one, you can be sure more will follow. The best way to keep them out is to repair damaged clap boards, window and door trim and to caulk small cracks.

The Multicolored Asian Lady Beetle (*Harmonia Axyridis*) now makes its home in the United States. A native of Asia, this beneficial ladybug was imported in the early 1900's to help naturally control pest populations that were damaging such crops as alfalfa, pecan and citrus trees.

Over the past 15 years, USDA, the Forestry Commission, state and private agencies have released this ladybug in several locations in the Northeastern part of the US. The beneficial aspects of this ladybug have been quite useful in reducing the need for pesticides and have relieved the hardwood forests of many disease carrying aphids, mites and scale insects.
Releases are no longer taking place.

Visit www.ladybuglady.com or www.buglogical.com for more information.

Parasitic Wasp – *Encarsia formosa*



Encarsia was one of the first biological control agents developed. This minute (< 1mm, 1/25 inch long) parasitic wasp is probably

tropical in origin. It does not sting humans.

With the exception of the adult, all stages of *Encarsia* occur within the whitefly host. Adults are tiny wasps that lay eggs inside 2 week old whitefly scales (second and third whitefly larval stages). Each egg will kill one whitefly scale. Adults lay up to 200 eggs. The parasite then develops inside the whitefly scale, and midway through the development of *Encarsia* within the whitefly, the scale turns dark. It becomes black for greenhouse whitefly, and transparent brown for sweet potato whitefly.

This occurs after 10 days at normal greenhouse temperatures. Another 10 days is required before adults emerge. Adult *Encarsia* emerge from the parasitized scale by chewing a hole in the top of the scale. Adults also kill whitefly scales by direct feeding. Otherwise, they feed on honeydew secreted by the whiteflies. Adults can live for 30 days but normally are active for about 10 days. The complete life cycle requires nearly 28 days in commercial greenhouses.

Parasitic Wasp – *Aphidius colemani*



Aphidius colemani is an amazing parasitic wasp that stings its aphid victim and lays its egg directly inside the aphid. In a couple of days, the aphid die and begin to swell up,

and as it swells a new parasitic wasp is developed and will soon emerge. Once the new parasitic wasp emerges and is able to fly, it will sting more aphids, lay more eggs, and continue the cycle again.

Aphidius is a good searcher, and can locate new aphid colonies when aphid populations are low.

Minute Pirate Bugs - *Orius* sp



Although pirate bugs (*Orius*) appear to have preferences for particular prey, they are general predators and will consume a variety of pests

including mites, thrips, aphids, and small caterpillars. They are called pirate bugs because they will continue to kill thrips even after they are done feeding. These insects occur naturally throughout North America.

Beneficial Nematodes *Steinernema Carpopapae* and *Steinernema Feltiae*



Beneficial Nematodes -For Pest Insects

Beneficial nematodes seek out and kill all stages

of harmful soil-dwelling insects. They can be used to control a broad range of soil-inhabiting insects and above-ground insects in their soil-inhabiting stage of life. More than 200 species of insect pests from 100 insect families are susceptible to these insect predators.

They are a natural and effective alternative to chemical pesticides, and have no detrimental affect on non-target species such as ladybugs, earth worms and other helpful garden insects. Finally, there is no evidence that parasitic nematodes or their symbiotic bacteria can develop in vertebrates. This makes nematode use for insect pest control safe and environmentally friendly. The United States Environmental Protection Agency (EPA) has ruled that nematodes are exempt from registration because they occur naturally and require no genetic modification by man.

**For more information visit
www.buglogical.com**

Amblyseius Cucumeris



Cucumeris is the preferred predator for thrips control. They are tan colored mites found on the underside of leaves along the veins or inside mature flowers.

Praying Mantis - *Tenodera aridifolia sinensis*



This adored insect, praying mantis is a general predator of most pest insects, mites, eggs, or any

insect in reach.

The Praying mantis is a most interesting and enjoyable beneficial insect to have around the farm. It is the only known insect that can turn its head and look over its shoulder. Mantis lie in wait for their food and when close enough, snap it up with a lightning movement of their strong forelegs. Measurements of their reflexes show they react more than 2 times quicker than houseflies. Mantis have enormous appetites, eating various aphids, leafhoppers, mosquitoes, caterpillars and other soft-bodied insects when young. Later they will eat larger insects, beetles, grasshoppers, crickets, and other pest insects.