

## II. Biological Control of Japanese Beetle in Michigan and the North Central United States: From Project GREEN (David Cappaert).

In this project we plan to reduce the pest status of Japanese beetle in Michigan, and ultimately in the North Central United States by collecting pathogens and parasites from areas of the Northeastern United States where Japanese beetle populations are dwindling and introducing them to Michigan where they have not yet been found. A summary of our work in 1999 can be found in the 70<sup>th</sup> Annual Michigan Turfgrass Conference Proceedings (Vol. 29).

Progress in 2000:

- Introduction of 500 *Tiphia vernalis* (a wasp parasite of Japanese beetle grubs) adults.
- Introduction of 2,000 *Istocheta* eggs on live Japanese beetle adults.
- *Ovavesicula* was recovered from one of five introduction sites in 2000.
- Initial work has begun in collaboration with Dr. Richard Clopton to describe the Japanese beetle Eugregarine pathogen as a new species.
- The parasitic wasp, *Tiphia vernalis*, was introduced at three locations in 2000.
- Two entomopathogenic nematodes and the milky disease bacterial pathogen were applied at five sites to evaluate their persistence and long-term impact on Japanese beetle larvae.
- At one of the five study sites, the nematode pathogens continued to infect a high proportion of Japanese beetle larvae, even 12 months after application, causing a decrease in the grub density to levels about 1/3 of that in untreated areas.

Results of our research after two years suggest that the Eugregarine and *Ovavesicula* pathogens combined with the *Tiphia vernalis* and *Istocheta sp.* parasites found in Connecticut and Massachusetts may help keep populations of Japanese beetle under control. Of these four natural enemies, only the Eugregarine was found in most Michigan locations, although it was not as abundant or widespread in Michigan as in Connecticut. The other three were completely absent in Michigan except one location where *Ovavesicula* was found. By following the incidence of these pathogens and parasites closely over the next three years in introduction and control sites, we should be able to determine which pathogens and parasites have the greatest impact on Japanese beetle in Michigan. Once pathogens and parasites become established at a research site, that site can be used as a pathogen or parasite nursery to collect and transport them to other locations in Michigan and the North Central United States.