THE FIELD INSECTARY

Controlling Cereal Leaf Beetle with Parasitic Wasps

The most efficient method of controlling cereal leaf beetle (CLB) is with natural enemies, specifically small parasitic wasps. These wasps have been used in the U.S. for over four decades as biocontrols for cereal leaf beetle, and if they establish successfully, can demonstrate up to 100% parasitism of CLB populations. The most efficient method of producing large amounts of these wasps is through the management of a field insectary.

A field insectary is designed to:
- Provide an area for the survival and production of parasitic wasps.
- Maintain a high population of CLB eggs and larvae throughout the spring and summer as food for the wasps.
- Provide a low-cost, effective alternative to controlling cereal leaf beetle infestations in your local area.
- Provide a supply of parasitic wasps for redistribution to infested areas in other counties and states.

Because there are no native wasps that attack CLB in our area, it is necessary to introduce foreign wasp species. In the 1960’s, researchers in the eastern U.S. identified four wasp species from Europe that offered the best control of CLB. Since that time, many states have set up biocontrol programs using these wasps and have seen successful suppression of the pest.

Now that CLB has spread to Washington grains, the WSDA, WSU, and the USDA are working with farmers to establish field insectaries and introduce these wasp species.

Site Selection
The USDA biocontrol Lab in Niles, Michigan, recommends the following characteristics for insectary site selection:
- Moderate to heavy recurring CLB populations
- Three or more acres of tillable land.
- At least 5 years availability
- Rolling terrain with natural protection (adjacent fence rows, trees, bushes)
- Grain crops in surrounding farm land
- Little possibility of insecticide drift

Kit Cutler Insectary 2003. '02 crop is fallow. '03 crop is winter wheat and 3 sequential oat crops, + native vegetation for overwintering. Photo by K. Cutler UBP

Breaking news:
The first CLB larva parasitized by *T. julis* was recovered from the Cutler insectary 6/18/2003!
Site selection and management
Keep the following conditions in mind (see diagram below):

- Direction of prevailing winds
- Availability of a grain drill and seed supplies of susceptible crops and varieties
- One planting of winter wheat and three plantings of oats (or spring wheat) each season
- Removal of crop by chopping or combining
- Soil surface is not to be disturbed for 2 years from planting date.

A rotating system of strip cropping encourages the beetle population to remain on-site. By concentrating the beetles in the insectary, a large number of CLB eggs and larvae will provide more hosts for the wasps, and a higher number of wasp progeny.

MORE BEETLES = MORE WASP FOOD!

The first goal is to attract lots of beetles to the site. The strips should be cultivated and weeds kept down in order to encourage lush crops. The beetles will emerge in the spring and be attracted to the first green crop they see (winter wheat). The beetles will mate and lay eggs on the leaves. As soon as the spring wheat or oats come up, the beetles will move to that crop and continue laying eggs.

During the first spring, wasps are released in the first year plots as the eggs and larvae become more numerous. During the second year, the first year plots are left completely undisturbed, allowing wasps to survive overwinter. New introductions of wasps are released in the 2nd year plots, which will remain idle during the third year. Many years of repeated releases will be necessary at each site. In addition, the positive effects of the biocontrol program may not be immediate.

The diagram below is an example of crop rotation at a CLB insectary site starting in fall 2002.

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<th>Spring 2004</th>
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<td>Harvest &amp; idle</td>
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