

# *Trichogramma* Use Guidelines for Fresh Market Sweet Corn

*Trichogramma ostrinae*, a small wasp that parasitizes and kills European corn borer (ECB) eggs, will be commercially available for the first time this season. In this article, we'll outline how to integrate *Trichogramma* releases into the existing fresh market sweet corn IPM practices.

*T. ostrinae* is affectionately known as "the Ghengis Khan of natural enemies" by those who know it best. In research conducted in sweet corn in New York State over the past 8 years, this wasp has produced remarkably high levels of parasitism (80-100% of ECB egg masses), shown an extraordinary ability to disperse throughout corn fields, and demonstrated that it is able to reproduce in the field and increase its numbers in response to increases in ECB numbers. Crop damage is typically reduced by half in fields receiving *Trichogramma* releases. Because of the wasp's excellent dispersal and reproductive abilities, we are able to use an inoculative release approach. Inoculative releases are inexpensive (around \$15/A for the wasps) because just a single release of relatively low numbers of wasps (30,000/A) is needed in each field. This single inoculative release has the potential to halve the number of insecticide applications to early season sweet corn for ECB control.

*T. ostrinae* does not parasitize either fall armyworm or corn earworm, the other two worm pests of sweet corn. You'll get the most benefit and save the most sprays releasing *Trichogramma* in early season fields before the armyworm and earworm flights start.

## **Release timing**

Using an inoculative release approach means that the wasps need to be released in fields just as the corn borers start to lay eggs. Experience to date indicates that releases are almost always successful except if made when there no egg masses are in the field. In these situations the wasps will die without reproducing. Timing can be a little tricky! Based on our experiences with research demonstrations, we're recommending that the wasps be released when the corn is in the 4-6 leaf stage. We're hesitant to recommend *Trichogramma* for early fields started under plastic at this point. Those fields are very attractive to egg-laying females because they're the plants are larger than those in bare-ground fields. There could be so many eggs laid immediately after the plastic is removed that releases of 30,000 per acre would not be able to parasitize them all. We'll be looking at that in at least one of our demonstrations this season.

## **Ordering *Trichogramma***

There are two sources for the wasps. They are available through IPM Laboratories in Locke, NY, Small quantities can be ordered a week before delivery. They will need more advance notice for larger quantities. For planning purposes, IPM Labs would appreciate advance notice if you're thinking about using *Trichogramma* this season. IPM Labs can be reached at 315-497-2063. Wasps can also be ordered through Insecterra, Inc. in Montreal, Quebec. Follow the same guidelines for ordering as described above. Insecterra can be reached at 514-524-2433 (email [ffournier@insecterra.com](mailto:ffournier@insecterra.com)).

## **Handling *Trichogramma***

One major difference between *Trichogramma* and insecticides is that the *Trichogramma* are alive! *Trichogramma* arrive from the insectary inside the eggs of the grain moths that they are reared on. They look like coarse grains of pepper. You want to be sure that they are still alive and in good shape when you put them in the field. That means not letting them get too hot (not leaving them in the truck in the hot sun if you get sidetracked on the way to the field), not letting them get too cold (they

should not be refrigerated), and not letting the wasps emerge from the grain moth eggs before you put them in the field. It's best to put them out in the field the same day as they arrive from the insectary.

### **Putting them in the field**

The wasps will arrive from the insectary as pupae in grain moth eggs glued inside cardboard release packets, each containing 8000 pupae. They need to be in release packets because natural enemies like lady beetles and lacewing larvae will feast on them if they get the chance, and there can be a lot of natural enemies in a corn field. The adult wasps will emerge from the pupae and escape from the release packet along the open edges. Distribute the packets as evenly as possible throughout the field, starting about 50 feet in from the field edges. If you have a long narrow field less than 125' wide, distribute them evenly along the middle row. For wider or more square-shaped fields you'll need to use more than one row. Flat wooden stakes can be used to put the release containers on if the plants are too small to attach them to. Do not put them on the ground, and when hung from a plant, locate them in the shade, such as under a leaf or on the north side of the plant.

### **Scouting release fields**

Throughout New England, growers make IPM spray decisions based on scouting for ECB caterpillars and feeding damage, starting at the pretassel stage. Where *Trichogramma* has been released, you can scout as usual (check 100 plants in groups of 10, determine % infested with caterpillars) and make your spray decision based on the 15% threshold. Eggs that were parasitized and did not hatch will never reach the larval stage, resulting in fewer caterpillars and less need to spray.

You can also determine whether wasps are doing their job by scouting fields for ECB egg masses. Search the underside of all leaves for the white, scale-like flat egg masses, which are about the size of a dime. Keep track of both the total number of egg masses and the number of parasitized ECB egg masses. Egg masses parasitized by *Trichogramma* turn evenly black, and are no longer really ECB egg masses. They're really *Trichogramma*, so they can be ignored when deciding if a field is over threshold. In the New York State IPM program, spray decisions are based on egg mass infestation (2 or more egg masses in the black head stage, or 15% infestation, out of 40 plants sampled).

### **Spraying release fields**

Using the inoculative release approach, *Trichogramma* will suppress ECB, but cannot be expected to completely control all infestations, so insecticide applications may still be needed. *Trichogramma* that are inside host eggs are somewhat protected from the spray and many will survive, but adult wasps may be killed. Some of the insecticides labeled for sweet corn are less toxic to *Trichogramma* than the others. Currently, Spintor does the least harm to *Trichogramma* in the field, and can help you get the most out of your investment in *Trichogramma*.

### **In a nutshell:**

Release *T. ostrinae* at a rate of 30,000/A when the plants are in the 4-6 leaf stage.

Handle the wasps correctly so they will be in good shape when they are released.

Distribute the release containers evenly throughout the field. Do not count parasitized ECB egg masses when deciding if a field is over threshold. Use insecticides with lower toxicity to *Trichogramma*.