

Release Monitoring for Parasitic Wasps

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Releasing beneficial insects into a greenhouse operation is becoming more popular with every growing season. You can now purchase biological control agents to aid in the control of greenhouse pests ranging from aphids to thrips to whiteflies. Here at Cornell Cooperative Extension we have been working on several biological control projects, including controlling whiteflies in poinsettia production using parasitic wasps. A result of the study was the development of a monitoring system for parasitic wasps which were available on cards or in blister packs. (The method developed can also be used for the wasps that are shipped loose in a carrier material such as bran, but it is not simple or reliable. Contact the CCE staff listed at the end of this article for advice). Experience taught us that the only way to really know how our biological control agents were releasing into the greenhouse environment was to monitor their release in a controlled environment. We recommend that any grower who works with biological controls to do the same. As you'll see, it's a simple process that can save you a lot of time and frustration in the end.

Our parasitic wasp monitoring system uses a catch-can method. The supplies we used to create our catch can included: a mason jar with a lid, a piece of tightly woven fabric (make sure the fabric mesh is smaller than your beneficials), 1/3 of a 3"x4" sticky card or approximately 1x2" piece of sticky card, a wire tie (longer than the mouth of the jar), masking tape or a label, a sample of the biological control agent, a marker/pen, a hole punch, and a hand lens. This is a list of the materials we used; any of the supplies can be substituted with comparable items that you have on hand.

Before you monitor your beneficial shipment you need to do a few things. First, check your shipment immediately for any damages to the product. Next, record the batch number of your product. The batch number is generally a date or code written on the label or on the back of the product. Keep this number so that if there is a problem you can relay all of the pertinent information back to your distributor/supplier. Next, you need to take a sample from your product. We suggest taking one to two samples from each product in the shipment depending on the size of the order. This could be 1-2 cards or 1-2 blister packs. If you are taking two samples, place each sample in a separate catch can.

Once you have all of your supplies gathered you can start putting your catch can together.

Step 1: Place the sample of the beneficial agent at the bottom of the jar/container.

(Remember to open the release packaging if necessary.)

Step 2: Punch a hole in the sticky card and place the wire tie through the hole in the sticky card and hang it from the top of the jar/container. (Make sure the sticky card is hanging and not touching the beneficials or the bottom of the jar.)

Step 3: Place the mesh on top of the jar/container followed by the lid.

Step 4: Use the masking tape to make a label for the jar. Label the jar with the following information: date, name of the beneficial, supplier's name, batch number, contents of the sample (i.e. 1 card) and the distributor (if using multiple distributors.)

Step 5: Place the jar in a protected, room-temperature area, out of direct sunlight not in the greenhouse.

Step 6: Let the jar sit for 2 weeks. This allows for enough time for all of the pupae to hatch.

Step 7: Count your findings on the sticky card. The hand lens or any magnifying device will come in handy at this time.

The beneficials on the sticky card are ones that we consider viable because they were able to fly. Those that have hatched but are still in the release pack or on the bottom of the jar are not considered viable because they are not mobile; they do not have the ability travel through the crop.

Once you count-up your sticky card findings you will have a rough estimate as to the number of wasps that emerged from the pupae on the cards or in the blister packs. To get the rough estimate you can use the calculation: the number wasps on the sticky card * the number of wasps ordered / the number of wasps in the release form. An example would be: We placed an ordered for 10,000 *Eretmocerus eremicus* wasps which were shipped in 40 blister packs (each blister pack contains 250 wasps). We took one blister pack as a sample and had a total of 264 wasps on the sticky card. To find the rough estimate of how many wasps released into the greenhouse we can use our formula: $(264 * 10,000)/250 = 10,560$. This means that approximately 10,560 wasps released into the greenhouse. Again this only a rough estimate as to how the wasps released into the greenhouse.

Depending on the type of release form the amount of wasps you will find on the sticky card will vary. Typically the suppliers over pack their product to account for any damages which might occur during shipping, so you should expect the number you catch to be fairly close to the allotted amount for the release form. If any discrepancies occur, contact your supplier immediately.

As biological control projects at CCE expand, we are planning on developing additional monitoring methods for other beneficials. If you have any questions or would like additional information on monitoring your beneficial shipments please contact any one of the following members of the CCE staff: Nora Catlin, Dan Gilrein or Laurie Mickaliger (631-727-7850 or 631-727-3595).