



The Berlese Funnel, a Tool for Monitoring Thrips on Orchids

Thrips are tiny insects that are barely visible without magnification. It is difficult to monitor orchids for thrips by visual inspection. Thrips are especially hard to see when the color contrast between the insect and the flower is not great, when they are not moving, or when they are deep within the blossom or hiding in crevices.

The modified Berlese funnel is a simple apparatus to separate thrips from orchid blossoms. Its use by orchid growers as a pest-monitoring tool in an integrated pest management (IPM) program is highly recommended. The materials needed to construct the device can be found at hardware, automotive, and similar stores.

The funnel is useful for monitoring thrips populations in the field or nursery, testing the effectiveness of insecticide treatments, and checking harvested flowers for export quarantine certification. The funnel also detects other tiny insects, such as aphids.

Constructing the funnel

1. Remove any filter screen from the funnel.
2. Cut the hardware cloth to fit and place it in the funnel.
3. With the hole saw bit, cut a hole in the center of the jar lid. Use Liquid Nails or similar adhesive to glue the lid onto the spout of the funnel about $\frac{1}{4}$ inch up from the bottom of the spout, so that the jar can be screwed onto the lid.
4. Bend four pieces of plumber's tape so that when evenly spaced around the lamp they will hold the lamp just above the funnel. Drill $\frac{1}{8}$ -inch holes in the lamp, and rivet the plumber's tape to the lamp. Adjustments can be made by bending the plumber's tape so that the lamp rests just above the funnel.

The funnel cannot stand on the small jar at the bottom—it needs to be supported in a box or bucket. A frame constructed from wood or galvanized pipe can be used to support one or more funnels.

Tool / Supply List

Materials

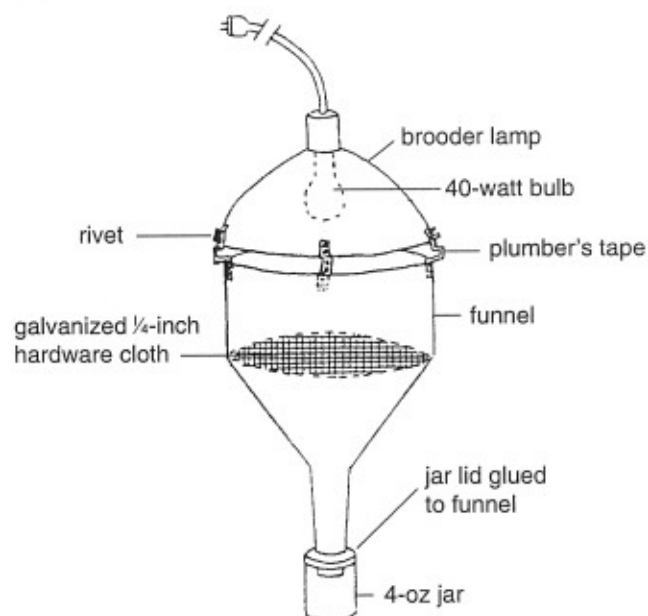
- 10-inch automotive funnel (e.g., Balkamp brand, Napa Autoparts, part #821-1126)
- 1 square foot of $\frac{1}{4}$ -inch mesh, galvanized hardware cloth
- 4-ounce jar with screw-on lid, such as a baby food jar
- 10-inch brooder lamp (e.g., Woods Wireproducts brand, Ace Hardware, item #30715)
- 40-watt incandescent light bulb (do not substitute a bulb brighter than 60 watts)
- 8 $\frac{1}{8}$ -inch aluminum rivets
- Liquid Nails brand adhesive

Tools

- electric drill with $\frac{1}{8}$ -inch drill bit
- hole saw bit the same size as the funnel spout diameter
- rivet gun
- tin snips
- pliers

For monitoring

- hand lens or magnifying glass (10x or more recommended)
- 70 percent isopropyl alcohol
- growers' log for recordkeeping



The modified Berlese funnel

Mention of a company, trade, or proprietary name does not constitute an endorsement to the exclusion of other suitable products or companies.

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Using the funnel to survey for thrips

Pour 1–2 fluid ounces of isopropyl alcohol into the jar. Screw the jar onto the lid. If you plan to have the thrips identified, use a mixture of half alcohol + half water, and add a drop of detergent. This keeps the thrips from getting too stiff.

Harvest enough sprays to yield 50–100 blossoms. Remove blossoms from stems. Record the date, cultivar, and number of sprays used in your grower's logbook.

Put blossoms into the funnel, place the lamp on the funnel, and turn on the light. Heat from the bulb drives the thrips downward, and they fall into the alcohol.

After 8 or more hours, turn off the light and remove the jar. Pour the alcohol into a flat dish. Using a hand lens, inspect the alcohol for thrips. If aphids or mealybugs are on the flowers, they will also be in the jar.

Moths and beetles may be attracted to the light and fall into the funnel. If this occurs, check the fit of the lamp and adjust the plumber's tape to minimize the space between the lamp and the funnel. If the problem continues, cover the space with a strip of wire window screen.

Record the number of thrips caught and divide by the number of sprays to determine the number of thrips per spray. This number, when compared with the numbers from other surveys, shows whether the thrips population is rising or falling.

Finally, clean the funnel and the jar. This is important to avoid contamination of future samples.

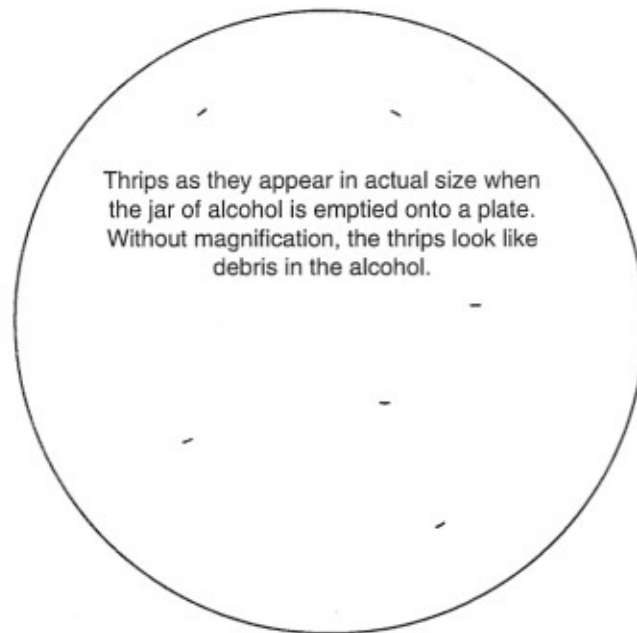
Description of thrips

Under a magnifying lens, the adults are usually yellow, brown, or black. They have narrow bodies that taper to a point at the tail end. Adults have wings that may be either partly spread or flat along the top of the body. The wings have a hairy fringe that can be seen with a good lens. The antennae are short and straight.

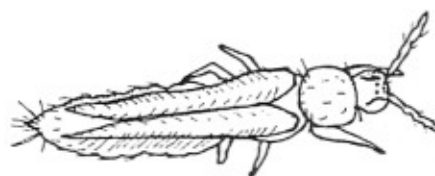
Juvenile thrips are usually white or pale yellow. Their bodies are smaller and may appear chubby compared with the adults. The juveniles lack wings. Like the adults, they have short, straight antennae.

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Thrips, greatly enlarged



adult



juvenile