TORULA YEAST PELLETS & BALL TRAP

(or McPhail type Traps)

Attractant trap for fruit fly species which respond to torula yeast such as olive fruit fly *Bactrocera oleae*

PRODUCT CODE:
AR934A Ball Trap, AR934B Ball Trap, AT800 Torula Yeast Pellets

TORULA YEAST PELLET FIELD LIFE:
4 to 8 weeks depending on environmental conditions. May require water replenishment due to evaporation.

SHELF LIFE:
2 years or more if properly stored.

UPDATED: June 2012

BACKGROUND

The olive industry in California has been threatened by an olive fruit fruit fly, *Bactrocera oleae* infestation which was first found in 1998. Since then it has spread throughout much of California, at an infestation range of approximately 100 miles a year. The adult female can lay 50 to 400 eggs in her lifetime, usually one in each fruit. The larva feeds throughout the olive and pupates in a hollow area just beneath the epidermis or outer skin. The immature olive fruit fly (maggot) tunnels throughout the fruit destroying the pulp promoting the growth of bacteria and fungi which increases the acidity of the olive oil. Development from egg to adult takes 30 to 40 days. Other generations during the year follow this same pattern but the last generation larvae abandon the fruit to pupate outside the olive. Adult flies can live from 2 to 6 months depending on the temperature and food availability (honey dew, fruit juices, bird feces, etc.).

The olive fruit fly has three and perhaps as many as five generations a year. Adults from the season's first generation appear as early as June coinciding with pit hardening. The second generation appears in August. In the summer season these flies can complete a generation in as little as one month. In most cases, the greatest damage occurs as the fruit begins to soften and turn color (September to November).

Olive fruit fly management measures should be implemented no later than 1st June, or earlier if monitoring data indicates the need.

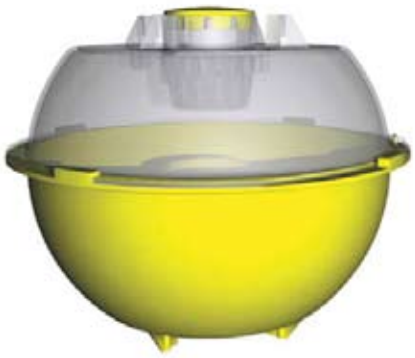
INSTRUCTIONS

1. The instructions for the ISCA Ball Trap™ may be applicable for other McPhail type traps. However, note the larger volume of the ISCA Ball Trap and follow the instructions applicable for the McPhail type trap. Twist off the clear plastic top of the ISCA Ball Trap™. If your ISCA Ball Trap has a lure receptacle at the top of the trap, the cover of the receptacle should remain closed. Traps with Torula Yeast solution attract more female than male olive fruit flies. For additional attraction of male olive fruit flies, the olive fruit fly pheromone lure (product code IT079P40) can be placed in the lure receptacle of the ISCA Ball Trap.

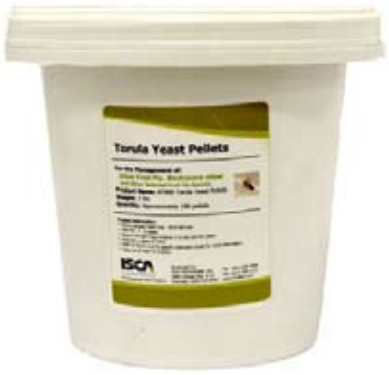
2. Fill the yellow (or colored) plastic bottom of the ISCA Ball Trap with water (almost to the rim). The water level can be filled to about 1/2 to 1 inch from the rim of the plastic bottom.

3. Based on a ratio of 1 pellet for every 10 ounces of water (1 1/4 cups), drop the Torula Yeast Pellets into the water. For the ISCA Ball Trap, 3 pellets are typically used.

Pictures and Illustrations:



ISCA Ball Trap in yellow.



Torula Yeast Bait Pellets in a 2 lb. container.

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TORULA YEAST & BALL TRAP (CONTINUED)

Attractant for flies

4. Twist the clear plastic top of the ISCA Ball Trap in place and hang the trap up on the olive tree using the provided string or wire. The pellets go through a fermentation process, so please allow approximately 2 to 3 days for the attraction to take effect depending on the ambient temperature.

5. (Optional) If using the IT079P40 pheromone lure for additional attraction, remove the lid from the lure, place the entire vial in the upper lure basket of the ball trap and close the lid of the basket.

6. Depending on wind and temperature, and your preferences, the water should be replenished when it evaporates below 1/2 of the water volume.

7. Depending on weather and environmental conditions, the field life of the Torula Yeast solution is around 4 to 8 weeks. For your first time of use, you should monitor the level of attraction based on a) how strong you want the attraction and b) the level of olive fruit fly infestation, to determine when you should dispose the solution and start with a new batch of pellets. The duration of the fruit fly attraction typically declines gradually after 4 weeks, but will continue to be effective for approximately an additional month.

8. Trap Placement: Traps are hung on the south side of the tree in winter and on the northside in the summer. Place traps on the inside of the canopy of fruiting trees, in open shade, with 8 to 10 inches of clearance from foliage.

9. Trap density for the ISCA Ball Trap with Torula Yeast Pellets is dependent on many factors, such as: purpose (e.g. detection, monitoring, mass trapping, or mass trapping used in combination with other pest control methods), infestation level fruit/crop use and economic damage threshold. For monitoring purposes, we recommend placing 1 to 2 trap(s) per acre in the early part of the season and doubled in October if sting levels go above the monitoring threshold of 3%. For mass trapping purposes, we recommend placing 1 to 2 trap(s) per tree. When appropriately deployed, the ISCA Ball Trap with Torula Yeast Pellets can provide good control of the olive fruit fly in areas with low to medium infestation levels. In areas with high infestation and fruit damage,, the ISCA Ball Trap with Torula Yeast Pellets may need to be supplemented with insecticide applications (such as GF 120) to provide optimal control. When a high density of traps is appropriately deployed for mass trapping, but the fruit damage is still high (more than 30% fruit damage), often the reason is that the olive fruit fly is not well controlled in the olive trees in your vicinity. For example, there may be olive trees in your neighborhood which are not controlled for olive fruit fly, and so they serve as host trees for the olive fruit fly. In such situations, one should where possible extend control efforts to host trees in your vicinity.

STORAGE INFORMATION

1. Unused Torula Yeast Pellets should be stored in the provided air-tight container or bags e.g. Ziploc bags, and placed in a cool and dry place.

2. Plastic McPhail Traps and ISCA Ball Traps can be stored preferably in a closed box to prevent dust build up.

RESEARCH BASIS AND OTHER INFORMATION

1. The female olive fruit fly can fly up to 2.5 miles to locate a host fruit. If a plot has olive trees in the vicinity, it is important that these trees are also treated. Effectiveness will be negatively affected if nearby trees are not successfully treated.

2. The olive fruit fly over-winters either as an adult or as pupa in the soil or in fallen fruit, and emerges as a winged adult in the early spring. The larvae can exit dropped olives and burrow one inch into the soil to pupate and over winter. Hence, post season management should include the removal of unpicked fruits from trees and dropped fruits to prevent

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over-wintering. Olives left on the ground may contain larvae that can complete their development in the ground. Dispose of unwanted olives in sealed plastic bags.

3. Minimize contamination of Torula Yeast solution on the outside surfaces of the trap and the trap surrounding area. Any contamination outside of the trap may reduce the attractiveness for the fruit fly to travel inside the trap.

4. The UC Extension and ISCA Technologies conduct on-going research on the olive fruit fly. You should periodically check for updated research information regarding the olive fruit fly, which can be found over the internet and the ISCA Customer Support website: http://www.iscatech.com/exec/index.htm . Instruction sheets are periodically updated to incorporate latest research information. You can review the latest instruction sheets at this website.

5. Environmentally friendly olive fruit fly management solutions such as the use Torula Yeast (a form of which is also used as a human food ingredient) are effective for managing low to medium levels of fruit fly infestation. At high levels of infestation, additional methods of management (for example GF120 spraying) may be needed to supplement the environmentally friendly solutions.

6. Related research sources and acknowledgements:

The University of California Cooperative Extension (UCCE) has conducted many research efforts in practical olive fruit fly control methods in California. Much of the olive fruit fly management information and recommendations in this instruction sheet are based on UCCE research results. ISCA Technologies also often coordinates its R&D efforts with UCCE and donates to its research efforts.

Mazomenos,Basilios E., et al. 2002. “Attract and kill of the olive fruit fly Bactrocera oleae in Greece as a part of an integrated control system.” IOBC wprs Bulletin Vol. 25.

Alfonso Montiel Bueno and Owen Jones. 2002. “Alternative methods for controlling the olive fly, Bactrocera oleae, involving semiochemicals.” IOBC wprs Bulletin Vol. 25.

7. The standard disclaimer for the information and use of ISCA’s products can be found in the ISCA Technologies Standard Terms and Conditions of Sale. You may request that a copy be sent to you or you can view this at the ISCA website at: http://www.iscatech.com/exec/sales.htm.

8. Please feel free to view the latest ISCA Olive Fruit Fly Management Products catalog and other customer support material at the ISCA website: http://www.iscatech.com/exec/customersupport.htm.

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