NAPPO
North American Plant Protection Organization
Organización Norteamericana de Protección a las Plantas
MEXICO - USA - CANADA

Surveillance Protocol for the Tomato Leaf Miner, *Tuta absoluta*, for NAPPO Member Countries

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Contents

Introduction

The tomato leaf miner, *Tuta absoluta* (Meyrick), originated in South America and is a significant pest of tomato (Solanum lycopersicum), as well as other solanaceous crops such as potato and eggplant.

The pest has been responsible for losses of 80-100% in tomato plantations in both protected cultivation and open fields. It attacks all aerial parts of the host (leaves, stems and fruits). Once introduced, T. absoluta can be spread by seedlings, infested vines with tomato fruit, tomato fruit and used containers. Outdoor markets, vegetable repacking and distribution centres are potential introduction points in the spread of this pest (CFIA, 2010). The economic impact is reflected by an increase in the cost of tomato production (additional costs for crop protection) and yield loss (lower marketable production), as well as potential loss of markets if it were to become established. It is also very challenging to control and limit the spread of the pest.

The impact that T. absoluta could represent for North America underscores the need to implement measures to prevent its introduction into the region or control it if it is introduced. To this end, the North American Plant Protection Organization (NAPPO) provides the following guidelines for regional surveillance for the tomato leaf miner in North America (Canada, Mexico and United States).

1. Purpose of the Survey

To establish a surveillance methodology that will allow for the early detection, delimitation and management of *Tuta absoluta* in the North American region (Mexico, USA, Canada), should it become introduced.

2. Information on the Target Pest

2.1 Pest name

Scientific name: *Tuta absoluta* Meyrick
Common names: Tomato leaf miner, tomato borer, South American tomato moth, South American tomato pinworm (English); palomilla del tomate (Mexico), polilla del tomate, polilla perforadora, cogollero del tomate, gusano minador del tomate, minador de hojas y tallos de la papa (Spanish); traça-do-tomateiro (Portuguese).

2.2 Life cycle

Tuta absoluta is a micro lepidopteran moth with a high reproductive potential, capable of up to 12 generations per year under optimal conditions. Its life-cycle comprises four development stages: egg, larva, pupa and adult, and is completed within 24 days at 27o C (Table 1).

Eggs are small, cylindrical, creamy white to yellow-orange, and 0.35 mm long. Females usually lay eggs on the underside of leaves or stems and to a lesser extent on fruits. Egg hatch occurs in 4-6 days.

After hatching, young larvae penetrate leaves, aerial fruits or stems, on which they feed and develop.

Larvae are cream coloured with a characteristic dark head and a lateral spot that extends from the ocellus until the posterior margin. Larvae lack a typical dorsal plate in the prothorax. Instead they have a dark oblique band that does not cover the dorsal midline.

The insect develops through four larval instars before transforming into the pupal stage. The larval instars do not enter diapause when a food source is available. As they grow older, they become greenish to light pink in the second to fourth instars (by feeding on leaves) and measure between 1 and 8 mm. The larval period is the most damaging period to plants and is completed within 12-15 days.

The larvae of T. absoluta attack the foliage by penetrating into the leaf and feeding on the mesophyll tissues. The feeding behaviour results in irregular mines on the leaf surface. Subsequently, damaged leaves shrivel, decreasing the photosynthetic capacity of the plants and potentially decreasing the plant's ability to defend itself from other harmful agents. When the attacks are severe, the leaves have a burnt appearance.

Older (3rd - 4th instar) larvae can feed on all parts of tomato plants. They can leave their mines and travel to new locations to mine again. This behaviour may result in damage to all stages of plant growth. The larvae produce large galleries in the leaves, burrow into stalks, apical buds, and green and ripe fruits. Fully-grown larvae usually drop to the ground on a silk thread and pupate in the soil, although pupation may also occur on leaves or in the calyx.

Pupae are cylindrical in shape and greenish when just formed, becoming darker in colour as they near adult emergence. The pupae are often coated with a white silky bud. Pupae have been found in the mines, outside the mines and in the soil, as well as beneath pots and under greenhouse benches.

Adults are 5-7 mm long with a wingspan of 8-10 mm. The most important identifying characters are the filiform antenna, silverfish-greyscales and black spots present on the anterior wings. Females lay eggs on the aerial parts of host plants. A mature female can lay up to 260 eggs and live for two weeks, whereas the males live only one week.

Tuta absoluta is nocturnal in habit. Adults usually remain hidden during the day, showing greater morning-crepuscular activity. They disperse among crops by flying.

The biological cycle of this moth depends on temperature (Table 1). Low temperatures are a limiting factor for its survival, but T. absoluta can overwinter as eggs, pupae or adults, depending on environmental conditions.

Table 1: Average length of the life cycle of *Tuta absoluta* at different temperatures

pest Stage	Duration (Days)		
	14 oC	20 oC	27 oC
Egg	14.1	7.8	5.13
Larva	38.1	19.8	12.2
Pupa	24.2	12.1	6.5
Total Egg-Adult	76.4	39.7	23.8

Source: Barrientos, Apablaza, Estay and Noreno, 1997, quoted by Estay, 2000.

Dispersal mode: Little is known about natural spread. However, there are indications that these moths can spread several kilometres by flying or drifting with the wind and can survive in fairly harsh conditions. This suggests that the insect spread may easily occur naturally or be greatly facilitated through agricultural trade.

2.3 Target hosts

Tomato leaf miner feeds mainly on solanaceous hosts; however, other hosts may be attacked occasionally. All of its known hosts are reported here.

- Major host: Solanum lycopersicum (= Lycopersicon esculentum), tomato.
- Minor hosts: Solanum habrochaites (= Lycopersicon hirsutum), Solanum tuberosum (potato) Solanum lyratum, Solanum muricatum (Peruvian pepino), Nicotiana glauca (tobacco), Solanum melongena (eggplant), Nicotiana tabacum (tobacco) and Capsicum annuum (peppers).
- Wild hosts: Solanum boraniense (granadillo), Solanum nigrum (common nightshade), Solanum elaeagnifolium (silverleaf nighshade, bull-nettle), Solanum pseudogracile (= S. gracilis), Solanum pseudocapsicum (Jerusalem cherry), Solanum viride (= S. puberulum), Solanum sisymbriifolium (wild tomato, sticky nightshade), Solanum aculeatissimum (Dutch eggplant, love-apple), Solanum americanum (black nightshade), Datura stramonium (common thorn-apple, jimsonweed), Datura ferox (fierce thorn-apple), Lycium sp., Lycium chilense (coralillo), Solanum saponaceum and Lycopersicum puberulum.

2.4 Pest distribution

The following countries are currently considered infested with *Tuta absoluta*: Albania, Algeria, Argentina, Austria, Bahrain, Belgium, Bolivia, Brazil, Bulgaria, Cayman Islands, Chile, Colombia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Ethiopia, Finland, France, Germany, Greece, Hungary, Iran, Iraq, Ireland, Israel, Italy, Jordan, Kosovo, Kuwait, Latvia, Lebanon, Libya, Lithuania, Luxembourg, Malta, Morocco, Netherlands, Palestinian Authority (West Bank), Panama, Paraguay, Peru, Poland, Portugal (including the Azores), Qatar, Romania, Russia, Saudi Arabia, Senegal, Slovakia, Slovenia, Spain (including the Canary Islands), Sudan, Sweden, Switzerland, Syria, Tunisia, Turkey, United Kingdom (all regions), Uruguay, Venezuela, and Western Sahara. See www.tutaabsoluta.com for up-to-date information on world distribution of the pest.

2.5 Pathways for introduction

Tuta absoluta could be introduced to North America by the importation of infested tomato fruit, tomato plants, and used tomato crates/packing boxes. The potential for transportation with other solanaceous crops or flowers is unknown, but is likely to be significantly lower than with tomatoes.

A pest risk management assessment carried out by the Plant Protection Service of The Netherlands (Ministry of Agriculture, Nature and Food Quality of the Netherlands, 2010) defines some ways in which T. absoluta can spread.

- Seedling
  If the tomato plants are being imported from infested areas, the probability of the pest being associated with the plants is high. The probability of pest survival during transport or storage is also high, because tomato plants are shipped live and with leaves.
- Tomato fruit and eggplant
- Fresh tomatoes are considered a high risk because the probability of larvae associated with fresh tomatoes surviving transport is high. Fruits in trade should have no signs of insect damage.
- Production facilities
  Several production facilities also repack and/or distribute imported tomato fruit. There is a high risk in repacked tomato consignments. If the pest arrives in a late larval stage or as pupa it can develop into a moth at the packing station. Outdoor markets that sell tomatoes from infested countries and are located in areas with suitable summer conditions for survival of T. absoluta, also pose a risk.
- Farm equipment and transportation vehicles
  Farm equipment from infested areas that is associated with transportation should be kept clean. Importing countries should ensure that crates that are returned to tomato producers from packing operations are sterilised before being returned and workers should be vigilant in cleaning or disposing of all packaging which may have contained infested fruit. Any vehicles that have been used to transport such fruit should also be cleaned to limit the possibility of spread.

3. Detection Surveys

Because tomato is the main crop known to be attacked by *Tuta absoluta*, the survey methodologies included here will focus on this crop. They may be adapted for application in other crops as required.

3.1 Purpose

These guidelines are provided for member country implementation to help in the early detection of *Tuta absoluta* should it arrive in North America (Mexico, USA, and Canada).

3.2 Target life stages

Primarily adult moths (trapping); complementary surveillance for additional life stages may be useful but is not mandatory.

3.3 Timing and duration

Tuta absoluta has multiple, continuous generations and can be present year round where suitable environmental conditions exist. For tomato productions facilities, the timing for the T. absoluta survey is directly linked to the tomato production cycle. This survey should be implemented as soon as the tomato production cycle starts (whether that be under protected cultivation or in open field) and should be concluded after tomato harvest. In facilities not under a production cycle, traps can be placed as soon as the trapping materials are available since tomato shipping is year round in North America. Similar procedures may be adapted for the application in other host crops.

3.4 Target areas and site selection

Tuta absoluta could be introduced to North America by the importation of infested tomato fruit, tomato plants, and used tomato crates/packing boxes, and of other hosts mentioned in 2.3 prioritized in order of importance according to volume and risk.

Facilities importing host materials listed above from the countries mentioned in 2.4 should be considered for trapping.

4. Delimiting Surveys

4.1 Purpose

To establish the boundaries of an area considered to be infested by *Tuta absoluta*.

4.2 Target life stages

All stages (egg, larva, pupa, and adult).

4.3 Timing and duration

The timing will be set by the date of the first detection that was observed and how quickly a survey can be planned and organized.

4.4 Target areas and site selection

4.4.1 Description of the area that is to be surveyed

The delimiting survey area could be an officially defined country, part of a country or all or parts of several countries (ISPM 5); for example - all of Mexico or the State of Colima, MX or the Region of Peel, Mississauga, CA or Dade County, FL, USA.

4.4.2 Identification of the district

The district(s) involved is/are selected as growing districts or regions of the area that appear to fall into rough groups on a map, for e.g. as maps with field crop and greenhouse production layers.

4.4.3 Selection of places in the district, field sites, sampling sites and sampling points.

Next the places in the districts that are to be surveyed are selected. Survey sites should be chosen with priority given to sites in proximity to urban centers, packing houses, commercial growers (field and /or greenhouses) or international ports where host material is received, communities with back yard tomatoes or other hosts, or markets.

Field locations within each place are identified as tomato fields, plantation lots, market stalls selling tomatoes, or high risk sites as: nurseries selling tomato seedlings, tomato farms, reception area in packing houses, sorting and packing areas, truck loading area, waste disposal area, composting facilities using plant waste from tomato farms, raw plants reception area, composting area, compost storage area, wholesale vegetable markets, reception area of incoming trucks, stores of bulk tomato, vegetable repacking and distribution centers, washing and packing lines, food processing/ salad packing/ tomato processing plants, washing and processing area, border crossings, customs inspection area, truck waiting yards, sea ports, and airports.

Sampling sites are then selected within each location. This could entail sampling field or greenhouse crops by rows or quadrants or individual plants, trees or structures or placement of pheromone traps. Grid maps of the survey area may be prepared and sites selected from the grids. Sampling points are then established. As this is a pheromone baiting survey, the sample point is the same as the sampling site.

4.4.4 Site selection procedure

A delimiting survey involves looking at a pest infestation and investigating into the extent that a pest has spread from the initial point of detection. This information is updated as new survey data becomes available. Locations and sites are chosen depending on the plants, crops, greenhouses and other facilities in the surrounding area. Surveys are conducted in an ever-increasing radius from the initial detection at locations and sites that may have had or currently contain a suitable host(s) with a conducive climate or environment in which the pest can establish and reproduce. In the case of T. absoluta, the delimiting survey would concentrate on tomato field and greenhouse production and packing and distribution facilities that handle host material.

5. Survey Methodology

5.1. Sampling procedures

5.1.1 Trap

Two types of Delta traps are available: cardboard delta triangle covered with sticky surface or another option with a removable liner. Either one is suitable for the current purposes, although delta traps with non-drying sticky liners are preferred. Traps are available from several suppliers in multiple colors, and all should be considered equivalent for this survey. Dry touch liners can capture and better preserve insects for examination than Stickum or Tanglefoot type liners which tend to wick through the specimen and ruin moth scale patterns.

Folding the trap is facilitated by breaking all creases and perforations. The end of the sides should not be folded in, to enhance moth capture. The peak of the trap should be stapled and an attachment wire threaded through the perforation.

National Plant Protection Organization (NPPO) contact information should be placed on the trap.

5.1.2 Pheromone lure

Pheromone type: Tomato Leafminer lure (Mixture of (3E,8Z,11Z)-3,8,11-tetradecatrien-1-yl acetate and (3E,8Z)-tetradecadien-1-yl acetate) loaded on rubber septum at a concentration of 0.5 mg. Depending on the environmental conditions this concentration should last up to 6 weeks. Please refer to the country NPPO for approved suppliers.

Handling and storage: All pheromones should be stored in sealed containers at temperatures below 0o C. Only one pheromone component should be stored per container (do not mix with other types of pheromones). Opened storage containers should be re-sealed after use. Pheromones can be stored for a maximum of two years if refrigerated properly. During transportation to the field, the pheromones should be kept cool and out of direct sunlight (in a cooler).

Disposable gloves should be worn at all times when handling pheromones, and a new pair of gloves between types of pheromone. This avoids cross-contamination of the volatile compounds and possible interference with their attractiveness. Gloves should not be disposed of in the vicinity of traps.

5.1.3 Trap placement and density

The pheromone should be installed before assembling the trap by laying the diffuser with the lure directly, flat onto the center of the sticky surface, ensuring that air passes through it.

Detection survey traps should be placed at the potential introduction sites listed in Table 2, taking into account that movement of T. absoluta is principally by human transport. A minimum of one trap per trap placement location at each survey site should be placed. For areas larger than 2500 m2, two traps/ha are recommended.

The delimiting survey is done by pheromone trapping using Delta traps at distances of 2 to 5 kilometres (this can be modified as needed) at the rate of two traps per hectare from the initial site of infestation. Once another positive trap catch occurs, additional two to three traps are placed per station at shorter intervals, 30 to 100 meters for example. Sites will be chosen depending on the location of high risk areas as host plants, alternate or weed plants' presence or location of tomato packing plants. Permission must be obtained from the owner or manager prior to initiating any trapping or survey.

Table 2: Suggested trap placement locations based on potential *Tuta absoluta* introduction sites

Survey Site	Trap placement locations
Tomato seedling nursery	Production area Compost area
Tomato farm	Production area Sorting and packing area Waste disposal area
Composting plant (using plant waste from tomato farms)	Raw plants reception area Composting area Compost storage area
Wholesale vegetable markets	Truck loading area Stores of bulk tomato
Vegetable repacking and distribution centres	Truck loading area Washing and packing lines
Food processing / salad packing / tomato processing plants	Truck loading area Washing and processing area

Tuta absoluta does not fly very high and prefers young shoots so that traps should be placed at an initial height of 0.30m and then it should follow the approximate height of the canopy raising it as the plant grows. The traps may be attached to planting stakes or other objects such as irrigation piping if the objects are in close proximity to the field. While it may be preferable to have traps within a planting row, these will receive pesticide applications and will remain inaccessible during re-entry intervals after applications. Traps at alternative locations may also be inaccessible, so it is important to communicate with the field manager immediately before entering the field.

For packing house sites, traps should be placed at a height where they do not interfere with normal activities. Traps should be placed near receiving areas, storage areas for fruits or packing containers, or waste (culls) containers. Traps located near farm/host crop processing waste locations have highest probability of capturing T. absoluta if present.

In facilities that handle product which may be either sealed (for example in plastic wrap) or non sealed (for example in trays or cardboard boxes) traps should be placed near non sealed products because there will likely be higher plant volatiles present which would increase attraction of T. absoluta to the area and could increase the trap detection efficiency.

5.1.4 Servicing the trap

Gloves should be used to handle traps and inserts in order to prevent their contamination. Traps and lures should be checked every two weeks and lures replaced every four to six weeks.

- Traps should be replaced if missing, damaged, or if the sticky surface has been compromised by debris.
- Traps with suspect moths must be collected for diagnostic submission and replaced with a new trap and lure.

- Inserts should be replaced at the two week servicing if they are covered with dust or insects; the lure should be transferred to the new insert with gloves or forceps.
- Old (older than 4-6 weeks) and missing pheromones lures should be checked and replaced.
- Old lures can remain in the trap for one servicing interval, and then they should be removed.
- At the end of the survey, if the trap is empty, it should be collapsed, squashed flat and placed in a suitable container for disposal.

5.1.5 Data to be collected

Data collected could be positive trap counts and/or records of infested tomato plants or alternate hosts.

Records should be maintained that provide data which at a minimum should be precise location of every trap (the GPS coordinates), name of the facility or land owner, the name of the trapper, the day the trap was placed at a particular site, servicing dates, when the trap was decommissioned and the results of each trap. Positive results also should include the day the pest was detected and how many target pests were in the trap. Records of infested tomato plants or alternate hosts also should be collected and maintained. Site numbers will be assigned that should generally conform to the following: two letter pest code – one letter for region – site number – trap letter (Ex: TA – D – 0001 – a) (See figure 1 of Appendix 1).

5.1.6 Biosecurity precautions

When visiting facilities surveyors should make sure they have taken steps to reduce the spread of pests such as removing soil and debris from clothing and footwear and washing hands with soap or approved antimicrobial. Where targeted facilities have biosecurity procedures in place, surveyors should become aware of the procedures and follow them.

5.2 Diagnostic procedures

5.2.1 Data storage

Existing country databases may be used to store all survey data. The files should be updated at least weekly or as new information is available. Further guidance on recordkeeping may be obtained in ISPM 6: 1997.

5.2.2 Sample handling and laboratory submission

If there are no Lepidoptera (moths) in the trap or if there are only medium to large Lepidoptera, with body length greater than 1.0 cm, do not remove the trap or trap insert from the field as the size would preclude *Tuta absoluta*.

If Lepidoptera with body length less than 1.0 cm are present, examine the moths with a hand lens in the field, or bring the trap insert to the office and examine the moths using a dissecting microscope.

The target moths are very small (body length approximately 4-5 mm) with banded antennae. A field screening aid is available at:
(http://caps.ceris.purdue.edu/screening/tuta_absoluta)

If suspect moths or other life stages are present, or if there is uncertainty in the field regarding the species, the suspect moths must be submitted for identification by a trained taxonomist. The sample should be carefully packaged and sent overnight to the designated identifier or office in the respective country. Details on suggested procedures for packaging and shipping may be found in Appendix 2.

5.2.3 Sample preparation

NPPO guidelines should be followed for sample preparation. However, examples of guidelines in the case of the two types of traps can also be found in Appendix 2.

5.2.4 Labelling samples for shipping

Indicate "Tomato Leaf miner Survey" on the sample container. Ship all samples by express courier to the closest official NPPO diagnostic laboratory. Laboratory notification through email is suggested to ensure sample is tracked and properly handled.

5.2.5 Reporting procedures

For information on responsibilities of and requirements for contracting parties in reporting the occurrence, outbreak and spread of pests in areas, please refer to ISPM 17: 2002.

6. Phytosanitary Measures to be Applied upon Pest Detection

6.1 General phytosanitary measures

ISPM 5 defines phytosanitary measure as: "any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pest".

To avoid pest spread, quarantine measures may be necessary to control the movement of host commodities from infested areas to non-infested areas.

NAPPO countries should select appropriate phytosanitary measures taking into consideration their efficacy to reduce the likelihood of pest introductions. Selection must be based on the following considerations, some of them which can be found in ISPM 1: 2006.

Measures may include any combination of the following options:

- Tomato and/or secondary host commodities must be imported only in commercial shipments.
- Tomato and/or secondary host commodities must be produced in pest free facilities, for example, greenhouses or screen houses and packing houses approved by the NPPO of the country of origin.
- Internationally bound tomatoes must be packed in insect-proof boxes or in containers covered with an insect-proof mesh.

- Greenhouses must have double doors and all ventilation systems and openings must be covered with a 1.6 mm mesh (or smaller) to prevent pest entry.
- Greenhouses must have traps with lures for *Tuta absoluta* at a minimum density of 2 traps per hectare or equivalent, with no less than two traps per greenhouse.
- Greenhouses must be inspected by the NPPO during export season to look for T. absoluta.
- Records of these inspections must be kept by the NPPO.
- Tomatoes must be packed within 24 hours of been harvested, in approved packing houses.
- When packing tomatoes destined to any country in the NAPPO region, only tomatoes from NPPO approved facilities of the exporting country will be accepted.
- Each consignment of tomatoes and/or secondary host commodities must be accompanied by a phytosanitary certificate issued by the NPPO of the country of origin. The certificate must indicate that the commodity is free of soil, plant residues (no calyx, vines, stems or leaflet).

6.2 Options to prevent or reduce original crop infestation

The following measures may be included:
- Treatment of crop, field or place of production
- Plants growth in protected environments (greenhouses, isolation)
- Plants harvested at a specific age or time of the year

6.3 Options to ensure that the area, place, site of production or crop are pest free

The following measures may be included:
- Pest free areas. Requirements for pest free area status are described in ISPM 4: 1995.
- Pest free places of production or pest free production site. Requirements are described in ISPM 10: 1999.

6.4 Options within the importing country

Preventive measures applied within the importing country may include: communication programs to increase awareness among farming communities; a stringent surveillance to try to detect, as soon as possible, entry of T. absoluta; eradications programs to eliminate any source of infestation or containment efforts to limit its spread.

6.5 Phytosanitary certificates and other compliance measures

The issuance of phytosanitary certificates for export or re-export may be required to offer an official assurance that the consignment is considered to be free of *Tuta absoluta* by the NPPO of the exporting country and according to the phytosanitary requirements of the importing NPPO (ISPM 12: 2011). An additional declaration confirming the application of a specific measure may be necessary. Other compliance measures may be applied, according to a bilateral or multilateral agreement.

6.6 Prohibition of commodities

If no satisfactory measures can be found to reduce risk to an acceptable level, prohibition of imported host products may be the final option. This option should be considered only as a last resource.

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The appendix is for reference purposes only and is not a prescriptive part of the protocol.

Appendix 1: Suggested procedure for preparation, packaging and shipping of samples for identification.

The following are suggested procedures only. Each country may define their particular guidelines according to their requirements.

1. When sending whole traps

Traps with suspect T. absoluta must be removed from the site and the entire trap must be placed into a paper bag for submission. A paper label should be inserted into the paper bag with the trap. The paper label must contain the sample number or trap number, if applicable, collector's name, location, host and date of collection written in HB pencil. Trap(s) and packing material should be packaged to prevent shifting within a sturdy box that will resist crushing during shipping and be submitted as soon as possible after collection.

2. When sending trap inserts

Trap inserts from Delta traps with suspect moths should be carefully packed prior to shipping. The following are the suggested steps.

Ensure that trap number, the date the trap was installed and removed, and the number of suspect moths is recorded on the bottom of the insert preferably with permanent ink (Figure 1).

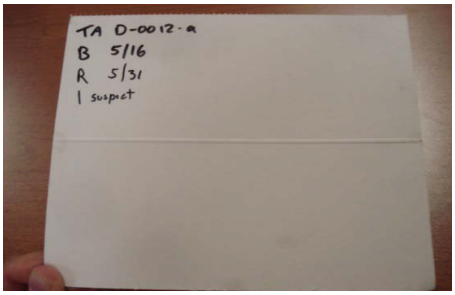

Figure 1. Information included on trap

2. Fold the insert over so that it forms a “C” shape. Secure the insert with two elastic bands. Ensure that the edges do not come in contact with each other.

Figure 2. Folded trap

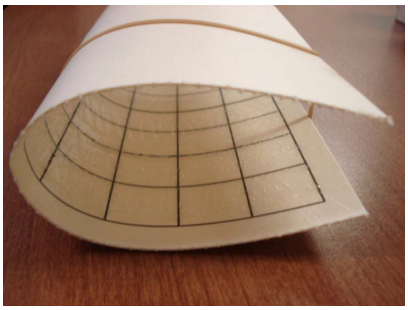

Figure 3. Folded trap showing “C” shape

3. Place the insert into a sealable bag. Sealing air in the bag will cushion the insert and help protect it from getting crushed.

Figure 4. Placement of trap in sealed bag.

4. Place the first sealable bag and a form (designed to record details of the trap as trap number, installation date, servicing date, number of suspect moths) into another bag. Sealing air in the bag will cushion the insert and help protect it from getting crushed.

Figure 5. Placement of form and sealed bag with trap into second sealed bag.

5. Place the inserts into a sturdy box for shipping to ensure that the inserts will not be crushed. Place other material (packing peanuts, bubble wrap, etc.), if necessary, in the box to ensure that the inserts will not move around.

6. Send an email to the office/identifier receiving the box with information about the trap insert being shipped and details entered on the form that is accompanying the trap insert.