CNCI MAY 2021 NOTICE

BOX TREE MOTH - BEST MANAGEMENT PRACTICES

Box tree moth, *Cydalima perspectalis,* is a foliar pest of boxwood (*Buxus* spp.) and is found in the Crambidae family. Box tree moth (BTM) was first confirmed in Toronto, ON, in the fall of 2018. Since then, significant monitoring has taken place to determine the scope of the infestation. CFIA, OMAFRA, University of Toronto, University of Guelph, Landscape Ontario, Canadian Nursery Landscape Association, and the City of Toronto have worked collaboratively to survey the pest and to develop programs to maintain export opportunities to the USA. In March 2020, USDA-APHIS regulated all of Canada for this pest and all species and cultivars (including plant parts such as holiday greenery) within the *Buxus, Euonymus and Ilex* genera[1]. The following best management practices (BMPs) are recommended to reduce the risk of importing and spreading BTM.

Insect Epidemiology and Diagnosis

Life Cycle

- To access the *Box Tree Moth Biology and Detection Webinar*, please see: *https://horttrades.com/box-tree-moth-webinar-and-online-discussion*
- There are two generations of adult moths per year in Ontario, with adult emergence starting as early as June 22 and finishing by September 15th. Recommended adult monitoring period is therefore from May through to September.
- At least one active life stage (e.g., larva) can occur between mid-April and September on infested boxwood plants in outdoor-grown crops.
- Dormant, overwintering larvae (~5mm long) can be found in a protected hibernarium or cocoon of webbing, up against a leaf, from early September to early May.
- For host plants grown indoors (either in a greenhouse or in a poly-covered cold frame), extended trapping is recommended at these facilities from April to September.

Infestation Evidence & Diagnostics

- On host plants, leaves will be the main sites of damage.
- Young larvae are small and can only consume the epidermis of the leaves.
- Older larvae can chew entire leaves, leaving only the leaf margin behind.
- Where unmanaged, established, severe larval populations have consumed 100% of the plant foliage; hungry larvae may chew on branches and stems, causing plant mortality.
- In addition to chewing damage, webbing of foliage with pellet-shaped frass and empty exoskeletons may be observed on host plants.
- If the pest is suspected, contact CFIA and suspend export shipments until CFIA or an accredited laboratory[2] confirms the identification of the suspect pest. If the pest identification is confirmed to be box tree moth, execute and document the appropriate steps described in the section below entitled, 'Eradication Procedures'.

Insect Management at the Nursery

Traceability and Documentation

[1] APHIS federal order: https://content.govdelivery.com/accounts/USDAAPHIS/bulletins/27f467d

[2] CFIA approved laboratories: https://www.inspection.gc.ca/science-and-research/our-laboratories/eng/1494878032804/1494878085588, https://afl.uoguelph.ca, https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/plant-health-laboratory

For traceability, records should be maintained for at least three years. Addresses and maps of all production facilities should indicate where activities (e.g., receiving, shipping, propagation, potting, etc.) take place. A modified Google map can be used. Other records include receiving, movement, and shipping documents, as well as scouting, pest management, and control/eradication activities.

Incoming Plants

On-site, self-propagation from a clean, regularly- inspected (see Pest Monitoring section below) source is the most effective strategy to prevent box tree moth from being introduced into a facility via plant material. If purchasing from outside sources, additional risk-prevention measures should be in place. The history of received host plants should include the supplier source and information regarding the BTM-BMPs under which the plants have been grown. This information should be included on or with the receiving documentation. Select suppliers from one of the following:

- Nurseries certified under the Canadian Nursery Certification Program or Greenhouse Certification Program with BTM pest modules (CNCP, GCP), or
- Nurseries that have implemented box tree moth BMPs and that participate in the Clean Plants - Phase 1 - Box Tree Moth Certification Program, or
- Nurseries in the Clean Plants Certification Program with the box tree moth module

Process for Received Host Plants

- Wherever possible, avoid receiving host plants during high-risk windows. For example, when adults are flying and eggs may be present, inspections are unlikely to detect pest presence.
- Incoming host plants must be inspected before being moved into production areas
- A separate holding area should be prepared to receive host plants. The area should be separated from the production facility by a) a barrier at least 0.5 metres higher than the top of the highest adjacent host plant, and/or b) a three (3) metre (canopy to canopy) host-free buffer. Host plants from different suppliers/sources should be separated from each other, until thorough inspections are completed and documented to verify the plants are BTM-free.
- Host plants should be randomly sampled and visually scouted for signs of BTM or for symptoms of pest damage under adequate light levels and scouting conditions
- The inspection of incoming host plants should be recorded
- Maintain purchasing records

Returns

- No host plants should be returned to the nursery after leaving the farm property.

Production Practices

Training:

- Early pest detection by nursery staff is critical to minimize spread before infested plant hosts are moved around the production facility areas.
- Train appropriate staff regarding BTM pest biology, identification & detection, including risk of pest spread by natural means, staff, equipment, pruning tools, plants, and plant debris. The *Box Tree Moth Biology and Detection Webinar*, mentioned in the Life Cycle section, is a useful resource. Check with your local association for additional training opportunities.
- Ensure staff know who to contact in the case of a suspected BTM find.
- Designated staff should be trained regarding pheromone lure and trap setup and maintenance.

Production:

- Use only new media for host plant production.
- If infested plants are suspected even in just one block, manage all production blocks as if they were infested until pest presence can be determined and delineated.
- To minimize the chance of pest spread, keep production blocks of host plants apart from each other with a 3-metre buffer (canopy to canopy) of non-host plants, or no plants between.

Pest Monitoring:

- Practise regular and thorough inspections by trained staff of all host plants (production and stock blocks) throughout production; keep records of damage, sightings and resulting actions.
- Inspection frequency should be at least weekly during flight period conditions (for outdoor production June 1 to September 30, and April 1 and October 31 for greenhouse or polyhouse production), and every two weeks during remainder of the production period of the plants. Additional inspections are recommended for facilities within the known pest infestation areas.
- Pheromone traps[3] are recommended to be placed around the perimeter of the host plant production area at a density of 4 traps per hectare or spaced at no less than one every 100m. Lures should be replaced according to manufacturer specifications and inspected weekly with documentation of results. Trap placement and removal should be coordinated with the weekly inspections; traps should be placed out at least one week before intensive inspections and removed no sooner than one week after these weekly inspections. See more details about traps at the end of this bulletin.
- Maintain monitoring records, pheromone trap inspections, diagnostic reports, pest management records and any follow-up details for at least 3 years.

Biosecurity

- Establish entry, movement and sanitation or exclusion restrictions for visitors and workers in host plant production areas.
- Ensure footwear, clothing and equipment are free of all BTM life stages.
- Implement a process for handling BTM infested material, including pest identification, confirmation and disposal protocols.
- Maintain areas relatively free of leaf litter and other host plant debris (e.g., production & shipping areas, delivery trucks) to reduce habitat that could harbour the pest.

Movement and Shipping of Host Plants

- During the adult flight period: avoid shipping where there is an active adult population as indicated by pheromone trap catch on the property (i.e., eggs may be present but not be easily detected during flight season). Shipments can begin after:
  i. no adult box tree moths are caught in the pheromone traps for 14 days
  ii. larvicidal treatments are applied starting on day 15
  iii. inspections 3 days after larval treatment reveal no live larvae
- Perform a thorough inspection of host plants before moving host plants to a new production area or the shipping area, verifying that no evidence of BTM is on the plants.
- Inspections prior to shipping should be within 2 days of the expected ship date.
- Maintaining host plants after the shipping inspection:
  - Host plants should be held in managed staging areas (maintained relatively free of debris and plant waste) and avoid placing host plants in areas within proximity (i.e., 3m or 10') to inbound or un-inspected host plants.
  - In infested zones <u>during</u> the adult flight periods: The inspected host plants should be protected from infestation by either storing in a screenhouse or a closed shipping vehicle (or other appropriate location to prevent BTM entering the area).
  - In infested zones <u>outside</u> the adult flight periods: it is recommended to stage inspected outbound host plants in a segregated area to prevent infestation, for example, a separate area or dock, or at least 3m (10') away from other host plants

[3] Göttig, S and A Herz. 2017. Observations on the seasonal flight activity of the box tree pyralid *Cydalima perspectalis* (Lepidoptera: Crambidae) in the Rhine-Main Region of Hessia. Journal Für Kulturpflanzen 69 (5): 157-165.

- Maintain records of the documentation and results of the outbound visual inspection and relevant shipping documents.
- Clean all plant debris from trailers before loading host plants.

Procedures After a Suspected and/or Positive BTM Find

In the event of a suspected BTM find, assume the pest is BTM and follow these recommendations:

- Notify your local CFIA regional office of the pest find and take a sample for identification.
- Cease shipping of host plants until eradication procedures are completed. This action is recommended for domestic shipments. In the case of export shipments, shipping must cease until CFIA inspects the affected plants and finds them to be free of BTM.
- Assess the severity of infestation (inspections, records, etc. to trace forward & back).
- Minimize traffic in/through the infested block.
- Determine the scope of eradication actions required. Trap monitoring, inspections and a spray program are recommended actions. Refer to OMAFRA guidelines for spray program information.
- Ensure complete cleanup and containment of plant debris, especially foliage.
- Dispose or destroy the infested material and debris by:
  i. Deep burial: to a depth of 1 meter covered by soil
  ii. Incineration to ash
  iii. Heat treatment – plant material placed in a sealed plastic bag and exposed to 48 hours of direct sunlight. Following heat treatment, the sealed bag will be disposed of in a landfill through the facility's regular waste stream.
- OMAFRA is currently recommending an 18-day window post adult detection before shipping can resume (see above, "Movement and Shipping of Host Plants").
- Keep a record of the actions taken.

Disclaimer

These BMPs are recommendations for nursery growers to enable rapid identification and eradication of any potential BTM finds in wholesale nursery production facilities. Implementation of these measures cannot guarantee that nurseries will remain free of BTM. This document is based upon the most current information available. As the science of box tree moth management evolves and new control measures are introduced, these BMPs will change.

For further information about BTM in your area, contact your provincial government agricultural ministry office, your regional office of the Canadian Food Inspection Agency, or your local nursery growers' association.

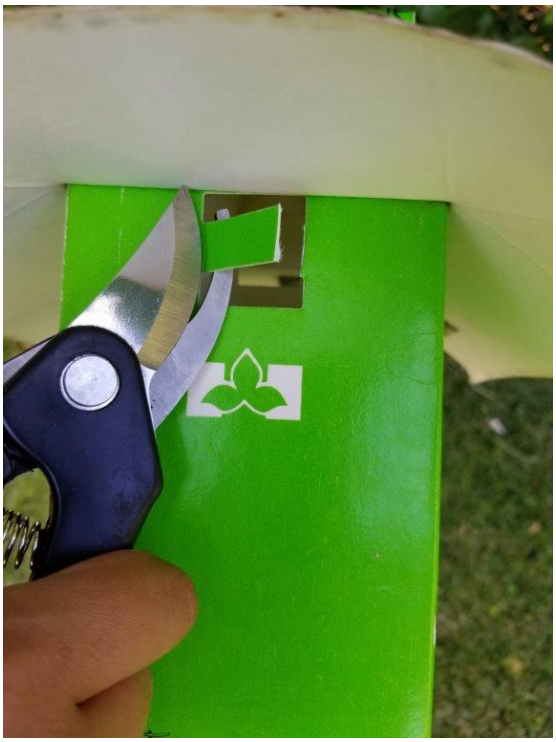
Excerpt from ONnursery Blog 2021-05-06 by Jennifer Llewellyn (OMAFRA):

https://onnurserycrops.com/2021/05/06/box-tree-moth-larvae-are-starting-to-feed-in-toronto/#more-5295

Pheromone Traps for BTM

For those of you wanting to order some BTM pheromone traps, here is what we have been using. Each trap with pheromone is effective at attracting adult males.

Here is the trap we used from Solida.ca. **Gypsy moth trap (milk carton style**, with sticky folding trap liner inside. Item #2050500). Inside use a Box Tree Moth Gel Lure (3 months, inject gel pheromone inside trap to attract BTM mid-May to mid-August) Item # 40M2001. Then after 3 months, drop in a Box Tree Moth Septa Lure (1 month, drop septa impregnated with pheromone Item #40IPS04) every 30 days to attract BTM adults until the end of September



Trap modification to increase efficacy. Cut the trap opening on the side of the carton such that the 2 openings become 1 larger opening (see photo) to facilitate BTM adults entering trap. Install trap 1 meter from the ground.

Or you can use their re-usable **Unitrap**, it is very effective at catching adult box tree moths.