



## RMD – 22 – 02: Pest risk management proposal for the regulation of *Cydalima perspectalis* in Canada

Effective date: **TBD**

### Preface

As described by the International Plant Protection Convention (IPPC), Pest Risk Analysis (PRA) includes three stages: initiation, pest risk assessment and pest risk management. Initiating the PRA process involves identifying pests and pathways of concern and defining the PRA area. Pest risk assessment provides the scientific basis for the overall management of risk. Pest risk management is the process of identifying, evaluating and selecting potential mitigation measures which may be applied to reduce the identified pest risk to acceptable levels.

This Risk Management Document (RMD) includes a summary of the findings of a pest risk assessment and records the pest risk management process for the identified issue. It is consistent with the principles, terminology and guidelines provided in the IPPC standards for pest risk analysis available at the [International Plant Protection Convention website](#).

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## Executive summary

*Cydalima perspectalis*, box tree moth (BTM), is native to East Asia and has become a serious invasive pest of *Buxus* spp. plants in Europe, where it continues to spread. *C. perspectalis* caterpillars feed on the leaves of boxwood (*Buxus* spp.) plants, which can lead to plant defoliation if left unmanaged. The feeding damage from the larvae is easily visible on the tree, with leaves often appearing skeletonized. The defoliation and dieback are unsightly, and reduce the plant value. Boxwood plants can be infested with all life stages of *C. perspectalis*.

Despite the rapid spread of *C. perspectalis* in Europe and non-native parts of Asia, it has not become widespread in the Americas. In 2018, three box tree moths were reported in Ontario, Canada, and the identity of the pest was confirmed by the Canadian Food Inspection Agency (CFIA) in November 2018 (iNaturalist, 2018; CFIA, 2018). The detection of *C. perspectalis* prompted the establishment of a BTM Technical Advisory Committee (TAC) to help guide collaborative response actions with key partners including monitoring, outreach and education and research. The industry associations, Landscape Ontario (LO) and the Canadian Nursery Landscape Association (CNLA), with support from the City of Toronto, University of Guelph and University of Toronto assembled a large BTM field scouting and treatment program in partnership with the Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAFRA) and the CFIA. Collaborative ground surveys and pheromone trapping were carried out in 2019, 2020, and 2021. In 2021, surveillance was expanded to include the Provinces of Nova Scotia, Québec, Ontario (outside the known infested area) and British Columbia. To date, *C. perspectalis* has only been found to be active in Ontario in: Greater Toronto Area, Cookstown, Georgetown, Milton, Mississauga, Burlington, Hamilton, Waterloo, Grimsby, Vineland, St. Catharines, Niagara-on-the-Lake and North Pelham. New York State (USA) also reported detections of *C. perspectalis* in 2021. Although boxwood plants are not native to North America, they are widely distributed in North American nurseries, gardens, and parks as an important ornamental shrub and thus, the establishment and spread of *C. perspectalis* in North America is a concern to the landscape and nursery industries. In 2019, annual market value of boxwood in production in Canada was approximately \$40 million CDN.

In Canada, *C. perspectalis* is not currently a regulated pest. In the U.S., *C. perspectalis* is listed in the U.S. Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) [Regulated Plant Pest List](#) (USDA-APHIS 2020b). Following the first detection of this moth in Toronto in 2018, the USDA-APHIS

implemented Federal Order DA-2020-07 in March 2020 revising the phytosanitary requirements for *Buxus* spp., *Euonymus* spp., and *Ilex* spp. plants for planting imported from Canada to prevent the introduction of *Cydalima perspectalis* into the U.S. Shipments from Canada were required to be accompanied by a phytosanitary certificate and an additional declaration stating that the shipment has been officially inspected and found to be free of *C. perspectalis* or produced in a facility or area officially recognized by the CFIA as free of *C. perspectalis*. On May 26, 2021, following the detection of BTM in a nursery facility in St. Catharines, Ontario and the subsequent interception of the pest in the U.S., USDA-APHIS published Federal Order DA-2021-11 prohibiting the importation of plants for planting of *Buxus* spp., *Euonymus* spp., and *Ilex* spp. from Canada to prevent the introduction of this pest into the U.S. via the plants for planting pathway.

Given the economic impacts of *C. perspectalis* to the Canadian nursery sector, the Canadian Nursery Landscape Association (CNLA) has submitted a written request to the CFIA to consider federal regulation of the pest. As a result, this Risk Management Document (RMD) seeks to obtain input from all stakeholders regarding three options for managing the pest risk posed by *C. perspectalis*.

## Purpose

The purpose of this document is to consult with internal and external stakeholders on risk management options for regulating *Cydalima perspectalis*, box tree moth (BTM) in Canada.

## Scope

This risk management document includes a summary of CFIA's risk assessments on *C. perspectalis* and presents three pest risk management options for the pest in Canada under the authority of the *Plant Protection Act*.

Information pertaining to import requirements for specific plants or plant products may be obtained from the [Automated Import Reference System](#).

## Definitions, abbreviations and acronyms

Definitions of terms used in this document can be found in the [International Standard for Phytosanitary Measures 5: Glossary of phytosanitary terms](#) or the [Plant Health Glossary of Terms](#).

## Background

Native to Japan, Korea, and China, box tree moth (BTM), *Cydalima perspectalis* (Walker), is an invasive pest causing severe damage to boxwood, *Buxus* spp., in Europe (Maruyama and Shinkaji 1987; Nacambo *et al.* 2014; Park 2008; Wan *et al.* 2014; Wang 1980). *C. perspectalis* was first detected in Europe in 2007, where it was first observed in Germany (Billen, 2007) and the Netherlands (van der Straten and Muus, 2009). Establishment likely occurred after multiple accidental introductions via shipments of ornamental box trees from Asia (van der Straten and Muus, 2009). In the short time frame since its establishment, *C.*

*perspectalis* has continued to spread into new areas and is now found in up to 30 European countries (Bella 2013; Nacambo *et al.*, 2014; CABI 2020; Strachinis *et al.* 2015). This spread has been aided by the free movement of live plants in the European Union and the presence of the two native species of boxwood (*B. Sempervirens* and *B. Balearica*) in the natural environment in Europe (Brua 2013; Leuthardt *et al.* 2010; Matošević 2013).

*Cydalima perspectalis* has a narrow host range, preferring boxwood (*Buxus* spp.). Boxwoods are planted as ornamentals and typically used for edging, as hedges, and/or clipped into different shapes to make topiaries. When infested, the plants are disfigured by the loss of leaves, webbing spun by the larvae, as well as larval excrement. Larvae feed mostly on leaves but may also attack the bark. Boxwood plants are not native to Canada and there are no natural stands, thus making it less significant as a potential environmental threat in Canada. However, *Buxus* spp. are widely distributed in North American nurseries, gardens, and parks as an important ornamental shrub and prior to 2021, it was a common nursery plant exported to the U.S. Based on a survey conducted in 2019 by Canadian Nursery Landscape Association (CNLA), annual value of boxwood in production (plants sold in one year and plants in the field) was \$40M, with annual sales by Canadian growers estimated at \$15M annually.

In October 2018, the CFIA was notified of a community scientist report of a detection of *C. perspectalis* in an urban Toronto neighbourhood and in November 2018, the CFIA confirmed its presence in the area (iNaturalist, 2018; CFIA, 2018). This was the first confirmed report of this pest in North America. In April 2021, the CFIA confirmed the first detection of *C. perspectalis* at a nursery facility in St. Catharines, Ontario, and the collaborative monitoring program was expanded within Ontario and monitoring was initiated in British Columbia, Quebec, and Nova Scotia. Subsequently, *C. perspectalis* was detected at facilities in the United States that received *Buxus* spp. plants from the Canadian facility. In May 2021, the USDA-APHIS published Federal Order DA-2021-11 to prohibit the importation of plants of *Buxus* spp., *Euonymus* spp., and *Ilex* spp from Canada (USDA-APHIS 2021).

*Euonymus* spp. and *Ilex* spp. were reportedly included in the USDA-APHIS federal order as suspect *C. perspectalis* hosts, although no detections of this pest have been reported on these taxa in Canada. To date, *C. perspectalis* has only been detected in Canada on *Buxus* spp. plants and only in southwestern Ontario. Detections in Ontario in 2021 have been confirmed in: Greater Toronto Area, Cookstown, Georgetown, Milton, Mississauga, Burlington, Hamilton, Waterloo, Grimsby, Vineland, St. Catharines, Niagara-on-the-Lake and North Pelham (Figures 1 and 2). During the 2022 survey season more detections are expected and there has been a confirmed detection in Tecumseh, Ontario in June 2022. To encourage early detection, the CFIA and its partners have an active social media campaign to engage residents in high-risk areas. When *C. perspectalis* is confirmed in an area, educational information is distributed, and homeowners are encouraged to treat the pest or remove *Buxus* spp. and replace them with a non-host shrub.

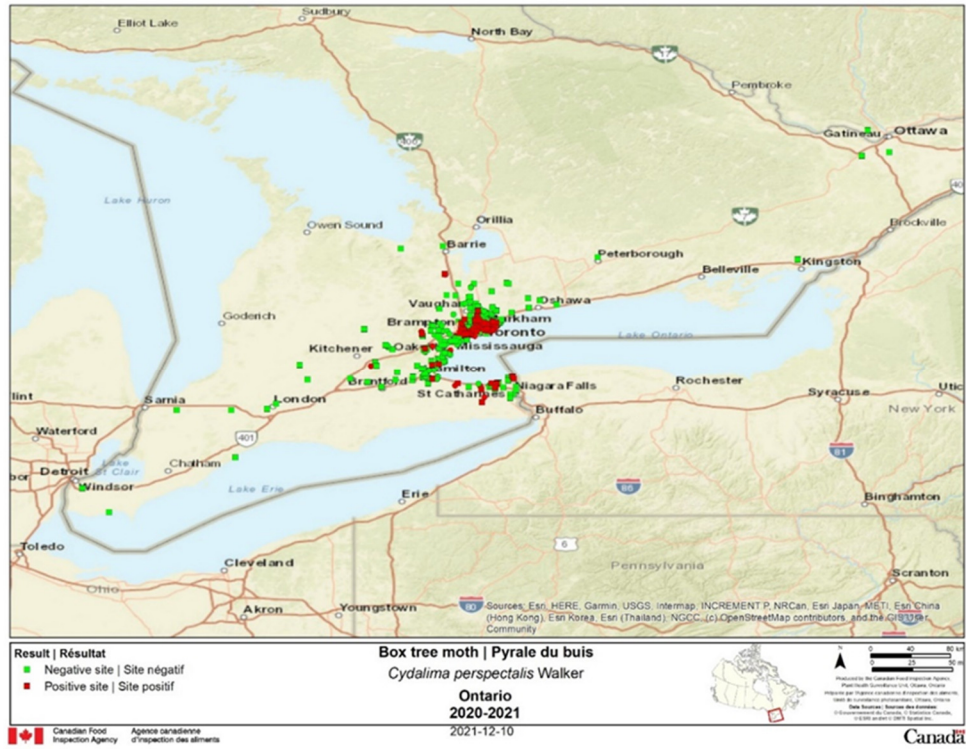


Figure 1. 2021 box tree moth survey results for Ontario.

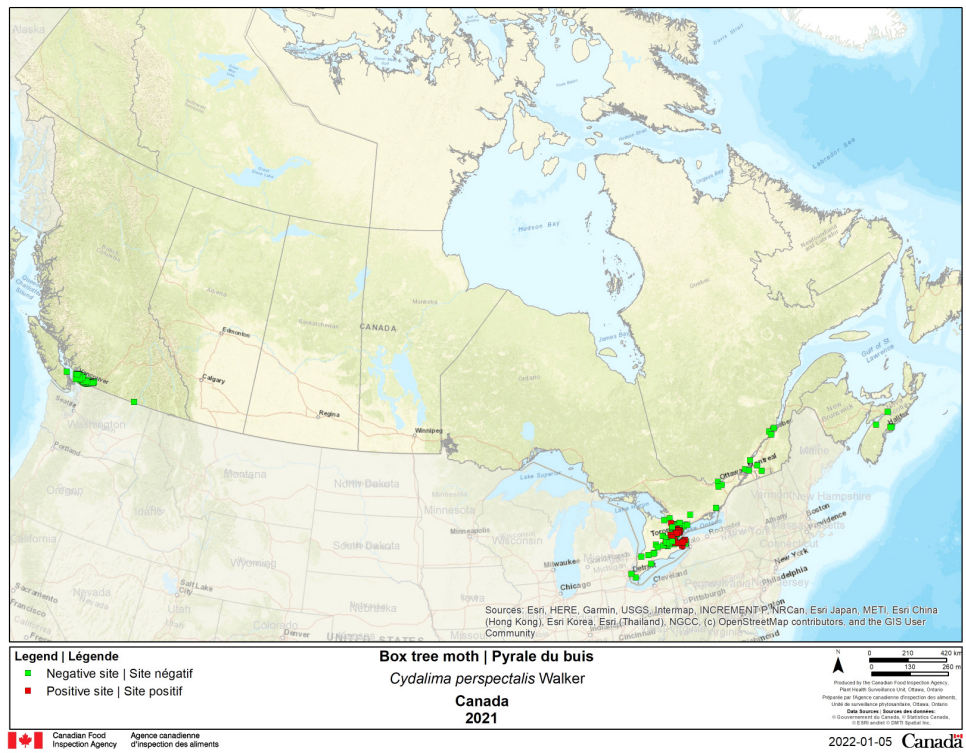


Figure 2. 2021 box tree moth survey results for Canada (BC, ON, QC, NS)

Currently, *C. perspectalis* is not on Canada's list of federally regulated pests. In October 2021, the Canadian Nursery Landscape Association (CNLA) submitted a letter to the CFIA requesting the regulation of *C. perspectalis* for all three genera of hosts for which export restrictions are currently in place: *Buxus* spp., *Euonymus* spp. and *Ilex* spp.

This Risk Management Document (RMD) summarizes pest risk assessments and presents three options for regulating *C. perspectalis* in Canada:

- (1) no federal regulation
- (2) establishment of a localized regulated area in the Greater Toronto Area (GTA) and Niagara peninsula (municipalities with positive detections), or
- (3) establishment of the province of Ontario as a regulated area.

## Pest risk assessment summary

### Pest biology

Geographical location, larval food source, as well as temperature have significant impacts on the biology of *Cydalima perspectalis* with respect to adult longevity and fecundity, larval developmental time, diapause, number of generations in a year, etc.

Eggs are laid on the underside of host leaves, usually in a cluster of about 10 to 20 eggs (Kenis *et al.* 2013; Salisbury *et al.* 2012). The eggs hatch in about three days and young larvae feed on the underside of the leaves. The larvae produce webbing on the leaves which helps to shield them from predators. Larvae take about two weeks to mature and pupate. Pupae take about two weeks to transform from caterpillar into moth (Strachinis *et al.* 2012; van der Straten and Muus 2009).

Depending on a number of biological factors such as temperature and humidity, *C. perspectalis* can have several generations per year (Maruyama and Shinkaji, 1987). In 2021, in Ontario, two generations of adult moths (peaking around the last week of June/first week of July and again around the last week of August/first week of September) were observed, in contrast to the three to five generations reported in Europe. In Canada, larvae of the first generation were observed from April to early June, with the first pupa observed in late May. Adult activity began during the second week of June. The second generation of larvae were observed from late June to mid-August. Pupae were found from late July to mid-September.

*Cydalima perspectalis* overwinters in the larval stage in a silken cocoon spun between host leaves. Adult moths live for about two weeks and can fly up to 10 km per year (Brua 2013; Leuthardt *et al.* 2010; Matošević 2013). During the day, they can be found resting on host plants or on other surrounding plants. Larvae representing the overwintering population in Ontario in 2021 were found actively feeding on *Buxus* spp. plants from late August to mid-October. Overwintering structures were observed beginning in July.

Damage to boxwood plants is caused by the larvae feeding on the leaves and sometimes on the bark. Boxwood trees can survive being attacked by box tree moth provided that the larvae do not eat the bark of the main stems. Younger larvae feed by eating the lower surfaces of the leaves, leaving the upper epidermis intact. Older larvae feed inside a pale white tent of webbing that they have spun for protection

and skeletonize the leaves, leaving only the midribs and outer margin intact. Signs of an infestation include: webbing, green pellet shaped frass, cast skins, head capsules, and chewed leaves. Boxwood plants can be infested with all life stages of the *C. perspectalis* (Nacambo *et al.*, 2014). Unlike the severe damage reported in Europe, most of the boxwood plants observed to be infested with *C. perspectalis* in Canada sustained only minor to moderate damage in 2021. However, some unmanaged hedges were reported to be completely defoliated by *C. perspectalis* feeding occurring over approximately two years.

Given that the pest has only been reported in Ontario since 2018, there is still limited information on the behaviour and possible impacts of *C. perspectalis* in North America. Trapping and scouting activities continue to provide data on the phenology and biology of *C. perspectalis* in Ontario.

## Host Plants for *C. perspectalis*

*Cydalima perspectalis* is primarily a pest of *Buxus* plant species (Family Buxaceae) (van der Straten and Muus 2009). In Europe, *Buxus* spp. recorded as hosts of this moth are:

- *Buxus balearica* (Balearic boxwood)
- *Buxus bodinieri*
- *Buxus harlandii* (Harland boxwood)
- *Buxus megistophylla*
- *Buxus microphylla* (Little-leaf box)
- *Buxus rugulosa*
- *Buxus sempervirens* (Common boxwood)
- *Buxus sinica* (Chinese box)

One species of boxwood, *Buxus vahlii*, is native to Puerto Rico and the U.S. Virgin Islands (van Kretschmar 2017). Currently, Canadian nurseries propagate their boxwood from on-farm stock as a recommended best practice for the prevention of *Cylindrocladium buxicola* (boxwood blight). Some Canadian nurseries will purchase finished boxwood plants from US suppliers for re-sale if stock is in short supply domestically. Boxwoods were originally brought to North America as nursery stock from Europe and Asia, bred, and sold to homeowners. Thus, they are primarily found in urban areas, where they are planted around houses and in small gardens. There are no natural stands of boxwood in Canada unlike the situation in Europe (CFIA 2011).

In Asia, *C. perspectalis* is also a pest of *Buxus* spp., although some authors note plant species other than *Buxus* as hosts in Asia (Wang 2008, Korycinska and Eyre 2011): *Euonymus alata* (Winged spindle) and *E. japonicus* (Japanese spindle tree, family *Celastraceae*), *Ilex purpurea* (Purple-leaved holly, family *Aquifoliaceae*), *Murraya paniculata* (Orange jasmine, family *Rutaceae*).

*Euonymus alatus* is a deciduous shrub in the *Celastraceae* family. The leaves of this species turn bright red or reddish purple in the fall and are shed from the bush, revealing the corky branches. This makes the plant unsuitable and unattractive to hibernating *C. perspectalis* larvae. Brua (2013) reported that *Euonymus* plants are not suitable hosts for *C. perspectalis*. In this study, *C. perspectalis* was reported to cause significant damage to the leaves of six *Buxus* spp., however there was no damage to the leaves of *E. europaeus* and *E. japonicus* and just an insignificant amount of damage to the leaves of *E. alatus*. (Details on how these results were obtained were not provided.). In addition, Matošević *et al.* (2017) reported that field-collected *C. perspectalis* larvae starved to death (100% mortality) when provided with *E. japonicus* leaves. Similarly, Wiesner *et al.* (2021) also concluded that *C. perspectalis* could not survive or

successfully pupate while being fed with *E. alatus* or *E. fortunei* during larval development in laboratory studies. In Europe, *C. perspectalis* has only been recorded from *Buxus* species (Bury *et al* 2017, Kenis *et al* 2013, Wan *et al* 2014). Van der Straaten and Muus (2009) also cite unpublished tests performed by the Plant Protection Service of the Netherlands that showed that European populations do not attack anything but *Buxus*. Based on the surveillance and control activities in Ontario, *C. perspectalis* has only been detected on *Buxus* spp. plants and not on *Euonymus* spp. or *Ilex* spp. When scouting *C. perspectalis* populations, field technicians would check nearby plants for *C. perspectalis* larvae or feeding damage (*Euonymus* spp., *Pachysandra terminalis*, *Ilex* spp.) but no signs of damage or *C. perspectalis* life stages have been found on these species to date. Given the above observations, it is reasonable to conclude that *Euonymus* spp. and *Ilex* spp. are not suitable hosts for *C. perspectalis* in Europe or in Canada.

## Pathways for entry, establishment and spread

Introduction of *C. perspectalis* into Europe is believed to be via infested *Buxus* plants imported from East Asia (Kenis *et al.* 2013; Salisbury *et al.* 2012). Natural dispersal of adult moths might have been the primary method by which this moth arrived in the southern coast of England from continental Europe (Korycinska and Eyre 2011), from Germany to Switzerland (van der Straten and Muus 2009), and from Turkey to Greece (Strachinis *et al.* 2011). Data from Germany indicate that natural dispersal is about 5-10 km (van der Straten and Muus 2009). Eggs, laid on the underside of host leaves, and young larvae, with their greenish colour, can travel undetected on host plants (Kenis *et al.* 2013; Salisbury *et al.* 2012). Eggs, larvae, and pupae could survive long distance transport or storage on boxwoods (Plant *et al.* 2019, van Kretschmar 2017). There are two native species of boxwood, *B. sempervirens* and *B. balearica* that are found in the natural European environment. The shrubby nature of boxwood, especially in the nursery stage, provides deep pockets that make it easy for eggs and larvae to be well hidden inside the plant such that it takes effort to find them if present. In this state, they can survive and travel easily on plants, without being detected (Salisbury *et al.* 2012, Kenis *et al.* 2013).

There are currently no specific import requirements for boxwood coming into Canada. In general, consignments of plants for planting must be free of regulated pests and of soil and may also be subject to additional requirements depending on the species and country or region of origin. A phytosanitary certificate is required for all plants for planting imports, which includes inspection by the exporting country, and may be subject to inspection at the time of entry into Canada. Importation from areas other than the continental U.S. must be free from soil. Currently, Canadian nurseries propagate their boxwood from on-farm stock as a recommended best practice for the prevention of *Cylindrocladium buxicola* (boxwood blight). Some Canadian nurseries will purchase finished boxwood plants from US suppliers for re-sale if stock is in short supply domestically. Best Management Practices at Canadian nurseries, including the adoption of a *C. perspectalis* pest module (trapping, monitoring, treatments, etc.), greatly support efforts to mitigate risks at nurseries and represent the best approach for limiting the spread of *C. perspectalis* via the nursery pathway.

In April 2021, *C. perspectalis* was first detected in a nursery through the on-farm *C. perspectalis* surveillance pest module. Following the detection, the nursery immediately stopped all shipments of host plants, notified customers, industry and government agencies, inspected and treated all host plants. Community science and surveillance was further expanded in the region in the Greater Toronto Area to delimit pest infested area.



*Cydalima perspectalis* can survive in areas with *Buxus* spp. hosts where the minimum winter temperature is about -30°C. It overwinters in the larval stage in a silken cocoon spun between host leaves. Temperature threshold for the development of eggs, larvae, and pupae vary between 8°C and 12°C. Main *Buxus* species in trade in Canada are *Buxus sempervirens* and *B. microphylla*. *Buxus sempervirens* is grown for landscaping purposes in the most temperate regions of Canada such as the coast of British Columbia and southern Ontario (Brouillet *et al.* 2010+). *Buxus microphylla* is cultivated in Canada and nurseries in both British Columbia and Ontario offer this species for sale (Brouillet *et al.* 2010+). Hybrid *Buxus* cultivars are very popular in Canada. They are hardy in both southern Ontario and British Columbia (Drysdale 2008). CLIMEX modelling maps, using both past and future realistic climate normals, strongly indicate this moth can and will survive in Canada. Specifically, In Ontario, from Toronto southward. It may also infest areas north of Toronto from Montreal to North Bay. Future establishment in British Columbia and the Maritimes seems possible (CFIA 2019d).

## Potential economic consequences

Boxwood plants are considered by the nursery industry to be among the top five most important woody ornamental plants in Canada, with the annual value of transactions estimated at approximately \$40 million, of which domestic sales amount to \$15 million.

In June 2022, the CNLA reported a loss-to-date of sales of over \$6.5 million dollars to their growers since the publication of U.S. Federal Order DA-2021-11. Most customers order boxwood as one of multiple items in an order and as such, growers are losing, or at risk of losing, customers due to their inability to supply all requested products. The CNLA has also reported that there will be potential impacts to U.S. customers, who rely on Canadian growers as seedling and transplant providers.

## Pest management

Boxwoods infested by *C. perspectalis* can be treated with registered chemical insecticides or biopesticides based on *Bacillus thuringiensis* (Bt) (Kenis *et al.* 2013). Bioinsecticides based on Bt serotype kurstaki (Btk) have been effective against *C. perspectalis* larvae and is the recommended control method in Europe (Guérin, 2018; Göttig and Herz, 2016; Lefort *et al.*, 2014). In Ontario, Btk provides excellent control of *C. perspectalis* larvae and can be used to effectively manage this pest when peak larval feeding for each generation is accurately identified. Some defoliated hedges were observed to recover after Btk treatment during each *C. perspectalis* generation.

*Chelonus tabonus*, *Tyndarichus* spp. and *Trichogramma* spp. are reported to parasitize *C. perspectalis* eggs (Göttig and Herz, 2016; Wan *et al.*, 2014). *Casinaria* spp., *Compsilura concinnata*, *Dolichogenidea stantoni*, *Exorista* sp., *Protapanteles mygdonia* and *Pseudoperichaeta nigrolineata* are larval parasitoids of *C. perspectalis* (Belokobylskij and Gninenko, 2016; Shi and Hu, 2007; Wan *et al.*, 2014). In laboratory studies, entomopathogenic nematodes *Steinernema carpocapsae* and *Heterorhabditis bacteriophora* caused high mortality of *C. perspectalis* larvae. *Brachymeria lasus* and *Apechthis compunctator* are pupal parasitoids of *C. perspectalis* (Wan *et al.*, 2014). In 2021, scouting in Ontario led to observations of a parasitoid wasp (*Ichneumonidae*) attacking *C. perspectalis* pupae. A total of seven specimens were collected over the summer. More research is warranted to assess wasps native to North America as well as Asian parasitoids of *C. perspectalis* to establish a viable biological control program in Ontario. *Chelonus tabonus* (Sonan), a

larval braconid parasitoid, was identified as the most promising candidate for classical biological control due to its high parasitism in China.

In Ontario, pheromone traps, ground scouting, and community science surveillance (outreach and assistance with trap placement and monitoring) have been used to delineate the area of *C. perspectalis* infestation. Pheromone traps are an effective method of capturing adult male moths and are used to detect presence or absence of the pest in an area as well as to indicate flight period(s). Ground scouting is an effective means of detecting *C. perspectalis*. Removal and replacement of host plants from private properties was attempted when *C. perspectalis* was first detected in Toronto, but it was difficult to identify the location of all host plants and not all home owners were open to removal of host plants from their property. As this pest can fly, pest eradication by targeted removal of host plants from a single property was not feasible. The province of Ontario is working towards supporting long term management tools including insecticides and mating disruption. An integrated pest management approach is recommended for management of *C. perspectalis* in Southern Ontario which includes ground scouting, trapping, well-timed insecticide applications and a communication plan to engage and educate homeowners to help detect, report and manage this pest.

## Risk management considerations

### Standards of the International Plant Protection Convention

Canada does not currently regulate *C. perspectalis*. It is listed by U.S. Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) on its [Regulated Plant Pest List](#) (USDA-APHIS 2020b).

International Standard for Phytosanitary Measures 5 (ISPM 5) defines a regulated quarantine pest as a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (IPPC 2022).

A quarantine pest must meet the definition of “a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled”. The guidelines for official control include, among other elements, that measures be mandatory and that domestic and import requirements should have the same or equivalent effect.

The CFIA conducted multiple assessments on various aspects of *C. perspectalis* including pest categorisation, biology, hosts, pathways and potential impact over the past 10 years (2011-061, 2018-175, 2019-060, 2019-061, 2019-135, 2019-150, 2019-179, 2019-193, 2019-199, 2021-086, 2021-087, 2021-091, 2021-096).

Although the source of the detection of *C. perspectalis* in Canada remains unknown, its presence is an indication that there is a viable pathway of entry. The experience in Ontario has shown the ability of the pest to establish and spread. However, the pathway for introduction of the pest in Ontario remains unknown as it was first reported in an urban neighbourhood. There were no reports in the nursery sector until it spread naturally from the Toronto infestation. Natural dispersal is possible, but limited due to the lack of natural boxwood stands in Canada that would contribute to population growth and spread. Human-mediated spread is the primary means by which this moth spreads from one place to another. Economic and environmental consequences are rated medium as this moth has the potential to have significant negative impact on the trade of boxwood, especially with the United States.

*Cydalima perspectalis* satisfies the criteria of being present but not widely distributed and being of potential economic importance.

## Risk management considerations

Although *C. perspectalis* is not currently regulated in Canada, the Canadian Nursery Landscape Association has worked closely with its members and provincial partner associations to educate on this pest, and pest modules have been drafted to mitigate the risk of moving *C. perspectalis* with nursery plants. Since 2020, the CFIA has been working closely with the industry sector to develop a *C. perspectalis* systems approach, based on the principles of pest free place of production/site as per ISPM 10, to establish confidence and ensure the nursery pathway is not a pathway for spread. A pest-free place of production must have systems in place to: establish and maintain pest freedom, verify pest freedom, and maintain product identity and phytosanitary security of any shipment. In addition, *Buxus* spp., *Ilex* spp. and *Euonymus* spp. from Ontario are not sold to British Columbia. British Columbia is a major producer of these species and sells them to buyers in other provinces but, because of movement restrictions related to *Lymantria dispar dispar* (spongy moth) and *Popillia japonica* (Japanese beetle) in addition to the extended growing season and warmer climate in British Columbia, there is no market for Ontario product west of the Rocky Mountains.

Based on the surveillance and control activities in Ontario, *C. perspectalis* has only been detected on *Buxus* spp. plants. When scouting *C. perspectalis* populations, field technicians would check nearby plants for *C. perspectalis* larvae or feeding damage (*Euonymus* spp., *Pachysandra terminalis*, *Ilex* spp) but no signs of damage or *C. perspectalis* life stages have been found on these species to date. These observations align with the findings of Wiesner et al. (2021), who confirmed *C. perspectalis* could not survive or successfully pupate while being fed *E. alatus* or *E. fortunei* during larval development in laboratory studies. Following the detection of *C. perspectalis* in New York State, control activities within the state have so far only applied to *Buxus* spp. plants from regulated counties to prevent the spread of *C. perspectalis* to other parts of the United States. The CFIA believes that the scientific data currently available does not support the development of phytosanitary measures for *Euonymus* spp. and *Ilex* spp. as hosts of this pest.

## Risk management proposals

The CFIA presents herein three pest risk management options for *C. perspectalis* in Canada. Stakeholders will have an opportunity to comment on the proposal during the comment period stated below. Once feedback from stakeholders has been received, the CFIA will consider the comments and determine the most appropriate option. Once a risk management decision has been finalized, the CFIA will revise this document to include information about the decision and timelines for implementing phytosanitary measures. The finalized risk management decision document will be posted on the [CFIA website](#).

### Risk Management Option 1 - Status quo: No specific phytosanitary measures for *C. perspectalis*

Under this option, *C. perspectalis* would not be designated as a regulated pest in Canada. The CFIA would continue to work with stakeholders, including provinces and industry associations, to monitor the spread of the pest. CFIA will continue to support community science efforts, but will not conduct its own pest surveys. The CFIA will continue to advocate on the behalf of Canadian growers with respect to the U.S. Federal Order, based on surveillance data from growers, public reports, and provincial stakeholders. Pest modules for *C. perspectalis* will continue to be recommended for any facility that produces *Buxus* spp., *Euonymus* spp., and *Ilex* spp. Establishment of Pest-Free Places of Production and Pest-Free Production Sites based on the principles of ISPM 10 will also be encouraged. Industry has recently expressed a commitment to ensure that the nursery stock pathway will not be a pathway for spread of the pest. Emerging populations, when detected, could be controlled by host removal or treatment by industry and/or provincial stakeholders.

Pros:

- as *Buxus* spp. are the only hosts of *C. perspectalis* and as *Buxus* spp. are non-native to Canada, the economic and environmental impacts to Canada will be limited to the nursery and landscape industry in Canada
- natural spread of *C. perspectalis* may be slowed by the absence of natural stands of boxwoods in Canada
- industry would continue to be able to trade inter-provincially without restrictions or additional phytosanitary requirements
- continue to rely on industry best practices

Cons

- the nursery industry may be limited to domestic sales for an extended period of time
- domestic sales of *Buxus* spp. may decline as the risk of the pest increases, further impacting the \$15 million domestic market
- it is anticipated that exports of the three plant taxa will continue to be prohibited entry into the U.S. until USDA-APHIS de-regulates *C. perspectalis*, recognizes trapping data indicating that the pest is confined to Ontario or is satisfied that the risks associated with the importation of the three taxa has been sufficiently mitigated and amends their current import requirements

## **Risk Management Option 2 – Federal regulation of the pest –Creation of a localized regulated area in the Greater Toronto Area (GTA) and Niagara peninsula (municipalities with positive detections from 2021)**

Under this option, *C. perspectalis* would be added to CFIA's [Regulated Pest List](#) and would become federally regulated pest. This option would involve:

- the establishment of a regulated area in the Greater Toronto Area (GTA) and the Niagara peninsula which would be considered infested with *C. perspectalis* (see Figure 3)
- regulatory controls applied to *Buxus* spp. only (see Host Plants section above)
- implementation of domestic movement controls for *Buxus* spp. moving out of the regulated area. Specifically, facilities producing *Buxus* spp. within the regulated area would be required to implement a systems-approach to prevent pest spread (e.g., pest module) if they want to move or sell *Buxus* spp. outside the regulated area
- movement of *Buxus* plants out of the regulated area would require authorization by an inspector, through an inspection and issuance of a Domestic Movement Certificate.

Authorization would be dependent on the systems in place at the facility and may require visual inspection by CFIA inspectors

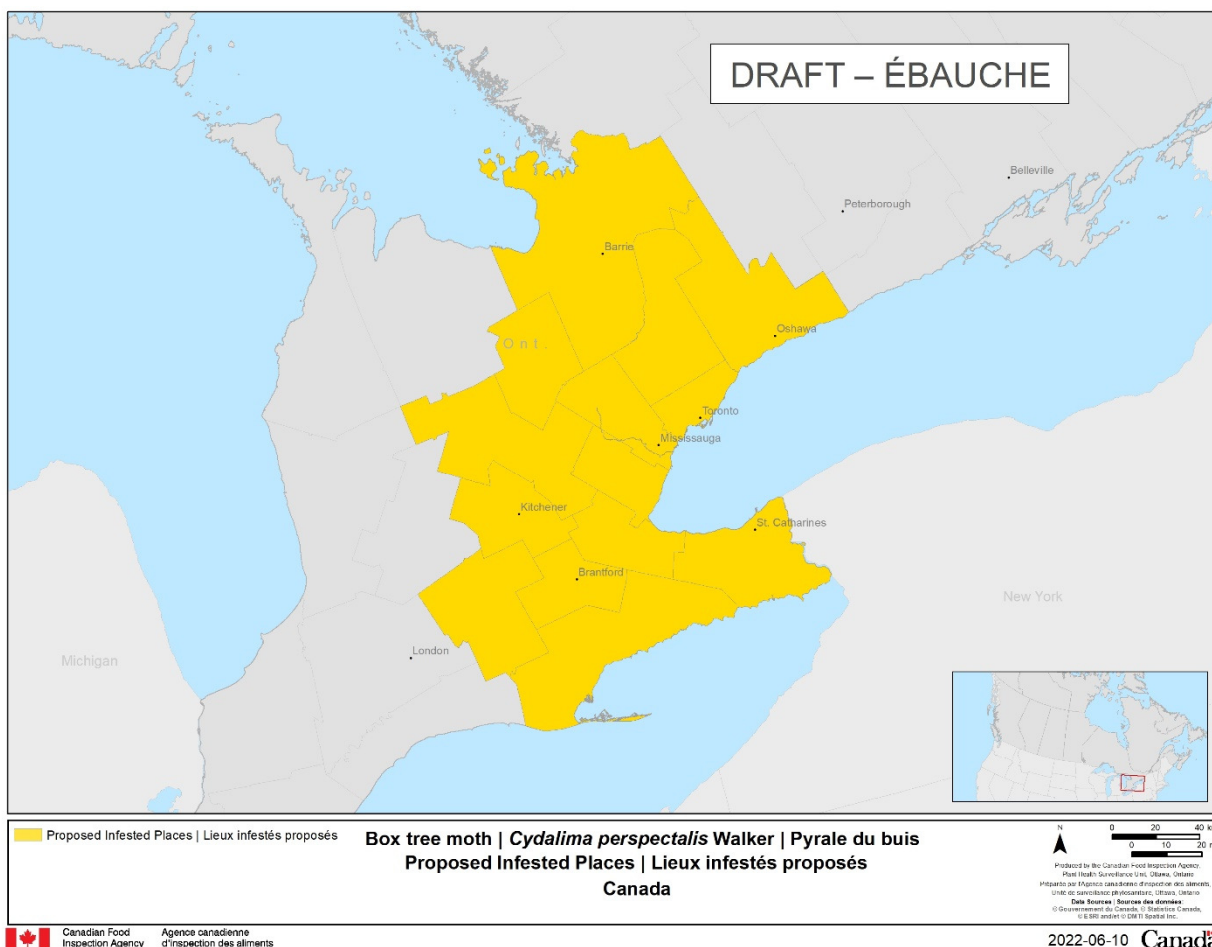
- unrestricted movement of *Buxus* spp. within the regulated area
- surveillance focussing on production areas outside the regulated area
- implementation of import restrictions including prohibition of imports of *Buxus* spp. from the infested area in New York State, U.S.A., into British Columbia. Other prohibitions/restrictions may also be necessary

#### Pros

- provides control measures to slow the human assisted spread of the pest throughout Ontario and the rest of Canada
- alignment of pest regulatory status with the U.S.
- responds to industry request for regulation to support re-establishment of trade with the U.S

#### Cons

- requires a more labour-intensive systems approach for preventing movement of potentially-infested plants until treatment has been applied
- CFIA will be required to enforce domestic movement requirements and resources will be redirected from other priority activities
- this option is the most resource intensive for the CFIA and potentially also for industry
- expansion of the regulated area may be required soon after publication based on the results of the 2022 survey



**Figure 3. Option 2 – Proposed Regulated Area in the Greater Toronto Area and Niagara peninsula (note the actual regulated area may vary)**

### **Risk Management Option 3 – Federal regulation of the pest –Creation of a regulated area for all of Ontario (recommended)**

Under this option, *C. perspectalis* would be added to CFIA’s [Regulated Pest List](#) . This option includes:

- establishing a regulated area encompassing the entire province of Ontario (see Figure 4).
- regulatory controls applied only to *Buxus* spp. (see Host Plants section above)
- implementation of domestic movement controls for *Buxus* spp. moving out of the regulated area. Specifically, facilities producing *Buxus* spp. within the regulated area would be required to implement a system to prevent pest spread (e.g., pest module) if they want to move or sell *Buxus* spp. outside the regulated area. Facilities further from main area of infestation may qualify to establish Pest-Free Places of Production and Pest-Free Production Sites in accordance with ISPM 10
- movement of *Buxus* spp. plants out of the regulated area would require authorization by an inspector, through an inspection and issuance of a Domestic Movement Certificate

Authorization would be dependent on the systems in place at the facility and may require visual inspection by CFIA inspectors

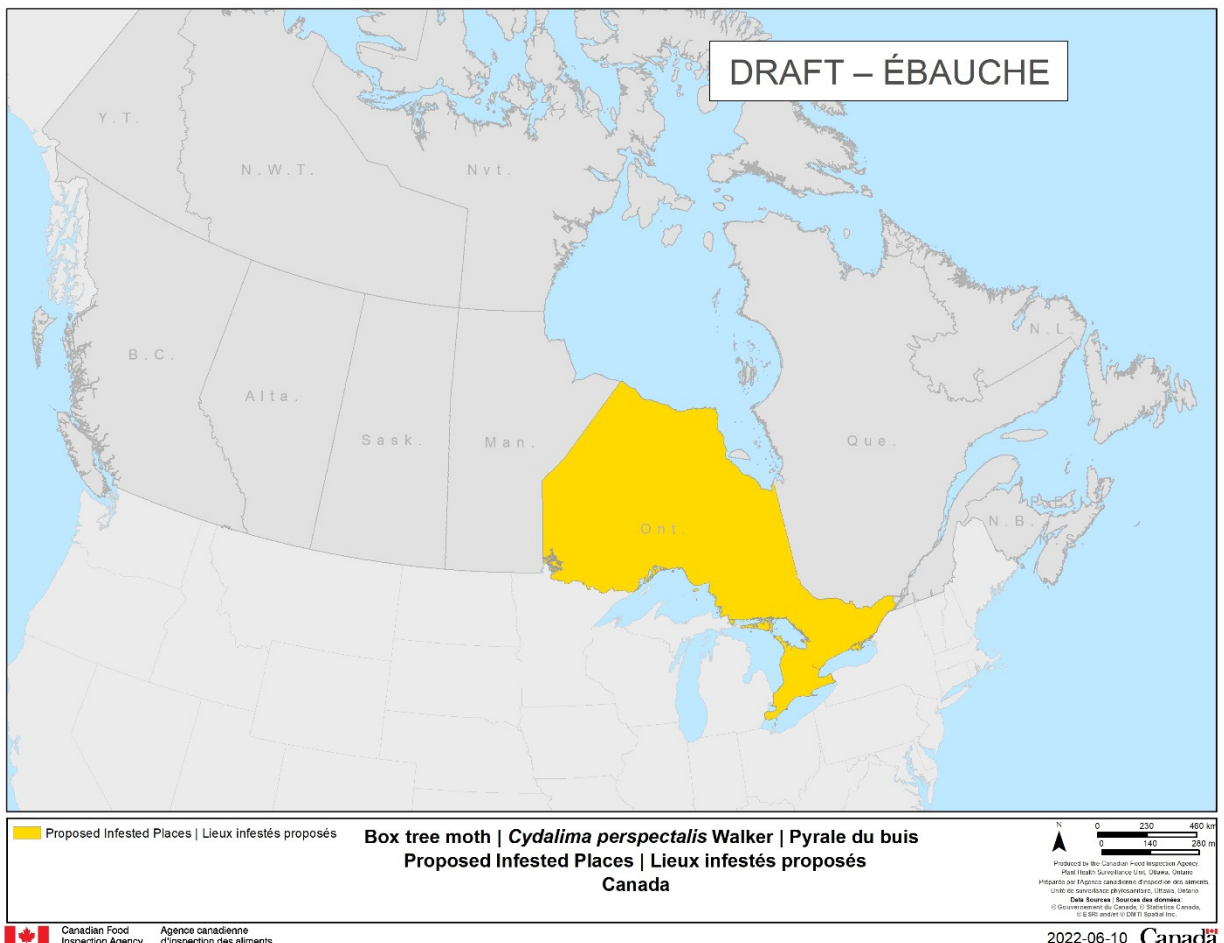
- unrestricted movement of *Buxus* spp within the regulated area
- surveillance focussing on production areas outside the regulated area
- implementation of import restrictions including prohibition of imports of *Buxus* spp. from the infested area in New York State, U.S.A., into British Columbia. Other prohibitions/restrictions may also be necessary

Pros

- no domestic movement restrictions within Ontario
- provides control measures to slow the human-assisted spread of the pest out of Ontario to the rest of Canada
- alignment of pest regulatory status with the U.S.
- responds to industry request for regulation to support re-establishment of trade with the U.S.

Cons

- requires a more labour-intensive systems approach for preventing movement of potentially-infested plants until treatment has been applied but number of impacted plants will be reduced as all sales within Ontario will be in the regulated area
- CFIA will be required to enforce domestic movement requirements and resources will be redirected from other priority activities



## Figure 4. Option 3 – Proposed regulated area for all of Ontario

### Recommended Option

Based on the discussions with the Canadian BTM Technical Advisory Committee , the CFIA recommends proceeding with Option 3 - **Federal regulation of the pest –Creation of a regulated area for all of Ontario**, in order to slow the spread of BTM and protect non-infested areas in Canada.



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