**RMD – 22-03:**
**Pest Risk Management Document: Risk management proposal for spotted lanternfly (*Lycorma delicatula* (White))**

## Preface

As described by the International Plant Protection Convention (IPPC), the Pest Risk Analysis (PRA) process 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. The pest risk assessment stage provides the scientific basis for the overall management of risk. The pest risk management stage is the process of identifying and evaluating potential mitigation measures which may be applied to reduce the identified pest risk to acceptable levels and selecting appropriate measures. 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.*

## Table of Contents

## 1.0 Summary

In 2014, spotted lanternfly (*Lycorma delicatula* (White)) was first detected within the United States (U.S.) in the state of Pennsylvania and has since spread to 14 eastern U.S. states. This includes recent infestations declared in Oakland County, Michigan (August, 2022) and in Erie County, New York (September, 2022) in close proximity to the Niagara, Ontario wine production region along the Canada-U.S. border.

Based on the best available risk intelligence, it is predicted that spotted lanternfly (SLF), a regulated quarantine pest for Canada, will be a major pest for Canada's grape and fruit tree industry and also negatively impact the nursery and forestry sectors.

Spotted lanternfly could be introduced to Canada in numerous ways, including on plant commodities such as nursery stock and forestry products, and on things that are not plants or plant products including conveyances, shipping containers and household goods.

Due to the proximity of the pest and the numerous possible pathways of entry, the risk of introduction to Canada is considered very high. The CFIA is working proactively to delay introduction while also preparing to respond when this pest arrives, using risk intelligence to inform the CFIA's risk management and risk communication efforts.

## 2.0 Purpose

The purpose of this document is to communicate the pest risk management considerations, and present options to manage the risk of SLF introduction and spread in Canada

## 3.0. Definitions, abbreviations and acronyms

Definitions for terms used in this document can be found in the Plant Health Glossary of Terms and the IPPC Glossary of Phytosanitary Terms.

*"Reproducing population"* means that there is biological evidence indicating successful reproduction and establishment within the natural environment.

For the purpose of this directive "nursery stock" is defined as any propagative woody plant material, both rooted and unrooted.

## 4.0 Background and pest risk assessment summary

This Risk Management Document (RMD) summarizes the pest risk assessment that was completed in 2014 and updated in 2021 (CFIA 2021b). The update in 2021 gathered and summarized new information about the distribution in the United States, and re-evaluated elements of the original risk assessment based on current information.

SLF is native to China, India, Taiwan, and Vietnam (Cornell CALS 2020, EPPO 2020). In 2014, SLF was first detected within the United States (U.S.) in the state of Pennsylvania and has since spread to 14 eastern U.S. states. This includes recent infestations declared in Oakland County, Michigan (August, 2022) and New York State where an interception was found in Buffalo, NY in September, 2022, across the border from the Niagara wine region in Ontario, Canada. Currently, no species of *Lycorma* are present in Canada, and all other known species are distributed in Asia (EPPO 2020). The SLF has a distinctive appearance that is unlikely to be confused with other insects occurring in Canada (CFIA 2021a).

**Pest biology and host range**

SLF is a large planthopper in the order of true bugs, which have piercing sucking mouthparts that are used to drill into the phloem of plants to allow the insect to feed directly on the sap (Cornell CALS 2020). SLF has one generation per year. The egg is the overwintering stage. The nymphs begin hatching in May and June and pass through four nymphal stages. The first adults are seen in July and can remain active until December in the U.S.. Egg-laying begins in September and continues until November in Pennsylvania. The life history in the U.S. remains the same as recorded in Asia and is expected to be similar in the areas of Canada at risk for establishment of SLF.

Females lay one to two egg masses, each containing an average of 30–60 eggs that are grouped into vertical rows (Dara et al. 2015; Lee et al. 2019). The egg masses are approximately 25 mm long and are covered in a yellowish-brown waxy coating that hardens to form an ootheca. Once hardened, it appears gray and resembles dried mud, often becoming dry and cracked over time (Dara et al. 2015; Spears and Mull 2019; Urban et al. 2020).

All life stages of SLF feed on sap from various plant species. Nymphs are highly polyphagous, but as they mature, they reduce their range of preferred hosts. Adults have a narrower host range and are highly attracted to tree-of-heaven (*Ailanthus altissima*) and a few other preferred species (Avanesyan and Lamp 2020). The absence of tree-of-heaven in some areas of Canada will not prevent establishment because other hardwoods present in southern Ontario and Quebec, such as silver maple, *Acer saccharinum* L. (Sapindales: Sapindaceae), weeping willow, *Salix babylonica* L. (Malpighiales:Salicaceae), river birch, *Betula nigra* L. (Fagales: Betulaceae) (Uyi et al. 2020), black walnut *Juglans nigra*, L. (Juglandaceae) chinaberry *Melia azedarach* L. (Meliaceae), oriental bittersweet *Celastrus orbiculatus* Thunb. (Celastraceae), hops *Humulus lupulus* L. (Cannabaceae), sawtooth oak *Quercus acutissima* Carruthers (Fagaceae), butternut *Juglans cinerea* L, and tulip tree *Liriodendron tulipifiera* L. (Magnoliaceae) (Murman et al. 2020) are suitable full-life-cycle hosts, albeit often with reduced ability to survive and reproduce than on preferred hosts.

Tree-of-heaven and black walnut occur in close proximity (<1 km) to vineyards in BC and ON (CFIA 2021c). In BC, tree-of-heaven occurs within 1 km of vineyards in the Kelowna, Osoyoos, and Penticton areas of the Okanagan. In Ontario, both tree-of-heaven and black walnut occur within 1 km of vineyards in Essex County, Niagara, and the greater Toronto area west of Etobicoke. In Quebec, fewer location records were available for tree-of-heaven and black walnut. None of the available records for tree-of-heaven in Quebec are located within 1 km of vineyards, although there are 2 black walnut locations within 3 km of vineyards just west of Montreal.

SLF has exhibited rapid invasion combined with an increased potential for harmful consequences. Nymphs are highly polyphagous, have been recorded on over 172 host plants worldwide (Barringer and Ciafré 2020), and many of these are native, cultivated, or alien to Canada. It is believed that the full host

list is not fully known yet (Murman et al. 2020). The high activity level of nymphs suggests that even hatchlings are likely to find suitable hosts in Canada, especially in the highest risk areas for establishment.

**Canadian areas at risk**

The highest risk areas for establishment of SLF in Canada are predicted to be in southern Ontario, the southernmost parts of Quebec and the interior valleys of British Columbia (Figure 1). These areas directly overlay many of the fruit and grape producing areas of Canada. Lee et al. (2011) found that spotted lanternfly eggs are capable of surviving temperatures around -11°C, but below that threshold survival decreases (YoungSu et al. 2014). Park (2015) conducted tolerance experiments and found that the instantaneous low lethal temperature causing 100% mortality of *L. delicatula* eggs was -20 °C, however, 15 days of -10°C and 10 days of -15°C were also sufficiently lethal. Wild-collected egg masses where January minima are below -16°C or January means are under -9°C showed less than 2% hatching success the next spring (Park 2015). Based on the accumulated evidence, it is unlikely that the SLF will be able to establish in areas in Canada where winter temperatures are routinely below -11°C. Therefore, although egg masses can travel long distances via human-mediated transport, cold temperatures in Canada will likely limit the spread of the insect to relatively warm areas. Ongoing research at Natural Resources Canada is exploring the cold tolerance limit for SLF and the results of this research may more precisely define the potential range for establishment.

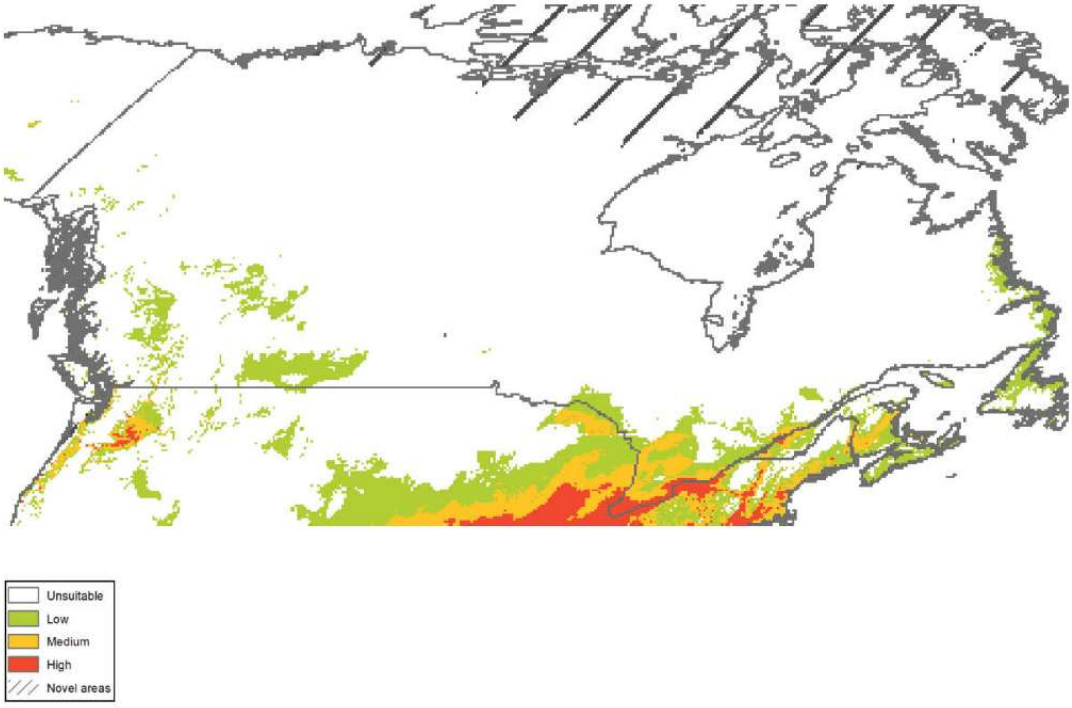


**Figure 1. Potentially climatically suitable areas in Canada. Source: Walkie et al. 2020**

**Pathways for entry, establishment and spread**

There are many possible pathways of introduction for SLF which is an effective hitchhiking pest and can lay its eggs on almost any smooth surface, including plants and non-plant products, and can be present as egg masses from September to May (Penn State Extension 2020, Burne 2020, Han et al. 2008, Cooperband et al. 2019b; Kim et al. 2010). The risk of entry for all pathways is mostly linked to the

presence of egg masses, which in general, are difficult to detect (EPPO 2016). Egg masses can survive long distance transport and cold temperatures. The arrival and establishment of SLF in Pennsylvania, hypothesized to have originated from China, suggests survival of long-distance transport and storage, especially in the egg stage (Cooperbrand et al. 2019). All materials that have been outdoors in close proximity to host plants during the egg-laying period represent a risk.

The SLF life cycle revolves around plants, and the primary substrates on which egg masses are laid is the surface of the bark of trees of many plant families (Liu 2019). Whole plants imported as nursery stock or as plants for planting, as well as branches, logs, etc., are likely pathways of entry into Canada. Plants for planting are thought to be the primary source for the entry and original spread of the pest through South Korea (Kim et al. 2021). In SLF infested areas, egg masses have been found not just on plants for planting and logs but also on plant pots, recreational vehicles, camping equipment, patio furniture, fences, building materials, and other items stored outside during the egg laying period. Egg masses have also been detected on conveyances such as shipping containers, trucks and trains.

SLF adults and nymphs are not capable of dispersing significant distances on their own, but they do disperse locally and adults are capable of flying. Adults and nymphs will disperse or drop off of items when disturbed. While hitchhiking adults and nymphs are less likely to survive long-distance transport, both live adults and nymphs have been observed on vehicles and transported goods.

**Potential economic consequences**

Major economic impacts related to SLF have been realized in the United States. In Pennsylvania, reduced grape quality, yield losses of up to 90% and death of vines have been observed despite significantly increased pesticide applications. In 2019, it was estimated that annual revenue losses may rise from $50 million to $325 million were SLF to infest the entire state of Pennsylvania (Harper et al, 2019).

The establishment of SLF in Canada is anticipated to result in similar impacts to those observed in the United States. The Canadian wine and grape industry contribute $9 Billion in economic impact to Canadian economy and almost 96% of the fruit farms in Canada are located in southern Ontario, southwestern British Columbia, southern Quebec and the Maritimes, the same areas predicted as the area of establishment in Canada.

**Pest management**

In the U.S., APHIS and state cooperators are collaboratively implementing a prevention and response program to detect, contain and suppress SLF. State quarantines, at the county level, have been established in some infested states including Pennsylvania, New Jersey, Delaware, Maryland and Virginia. At the state level, management and suppression activities may include surveillance, permit requirements for all commercial movement of regulated articles (including vehicles) outside of state quarantine areas, pesticide applications and certification of plant material. Numerous pesticide products labels have been amended to add SLF in the U.S. and are available for producers, governmental response efforts and the general public.

Despite efforts and available tools, SLF populations have continued to spread in the United States. Where control measures against SLF are available, they have not been sufficient to prevent further establishment. While some measure of SLF control may be observed in crops that are treated regularly,

the large host list presents multiple alternative choices of wild untreated plants, assuring local establishment and reintroduction of the pest post-treatment.

Few predators feed on the SLF including praying mantises, spiders and predacious bugs, and the level of predation is not considered high enough to provide reliable control (Cornell CALS 2021). Birds avoid them and Song et al. (2018) found that they possess several defenses against predation.

Parasitoids and entomopathogenic fungi have been reported to attack SLF, but so far the level of control in the U.S. is low. The spongy moth parasitoid *Ooencyrtus kuvanae* (Howard), Encyrtidae can parasitize eggs of SLF (Liu and Mottern 2017), but the level of parasitism is very low (Cornell CALS 2021). An epizootic event was recorded in Pennsylvania with high mortality of SLF caused by the entomopathogenic fungi *Batkoa major* and *Beauveria bassiana,* but so far this was a localized event (Clifton et al. 2019). More recent laboratory bioassays with *B. bassiana* show 90-93% mortality of SLF nymphs and 82-99% mortality of adults after 14 days (Clifton and Hajek 2022). This study was completed under optimal conditions for infection and future field studies are required to evaluate efficacy under normal, field conditions.

The CFIA established a SLF Technical Advisory Committee (TAC) in 2021 comprising Federal, Provincial, industry and environmental non-governmental organizations to work to address this pest in areas such as communications, surveillance and response and treatment options.

Limited control options are available in Canada and currently there are no registered pesticides with SLF on the label. Through the SLF TAC response and treatment working group suitable candidates for emergency use, minor use and full label registration are being determined, however, even after products are identified, label changes can take weeks to months for approval. Therefore, the CFIA is also working with the Pest Management Regulatory Agency to determine short term chemical control options while longer term solutions are identified and put into place.

In the absence of pesticide control products, treatment options in Canada would be limited to physical control which could include scraping of egg masses and crushing of nymphs and adults, regulatory controls to slow the spread of the pest and cultural control including removal of host trees.

## 5.0. Pest risk management options

### General risk management considerations

Due to the proximity of SLF to Canada, the volume of trade and traffic from areas infested with this pest, and the numerous potential pathways through which egg masses and hitchhiking adults and nymphs are able to spread, it would not be feasible to impose specific requirements on all pathways and products from infested areas in either the United States or within Canada after SLF is established here. Commodity-specific requirements will focus on the highest risk pathways, such as the movement of nursery stock and logs with bark. For all other pathways and products, a robust communication strategy will continue to be implemented to raise awareness of SLF and its potential pathways of spread, along with the obligation to report SLF sightings to the CFIA, and the need for risk mitigation measures (such as removal of all life stages) prior to movement of regulated articles out of an SLF regulated area. Outreach will continue to focus on raising awareness with the general public, the transportation sector and importers of goods typically stored in outdoor environments to prevent introduction and spread

within Canada. This approach is similar to that taken for spongy moth (*Lymantria dispar dispar*), a hitchhiking pest which also moves on numerous pathways, mainly through human mediated movement of egg masses.

Given that SLF is a regulated quarantine pest for Canada, should SLF be **detected** within Canada (no evidence of a reproducing population), the CFIA would consider the implementation of localized regulatory control measures to reduce the immediate risk of spread to the local environment and mitigate the risk of early establishment of the pest. Control measures may include prohibiting the movement of potentially infested articles out of an area where the pest has been detected and/or placing a quarantine on imported articles on which the pest has been detected. Treatment in the form of physical controls or chemical applications may be ordered to render the pest non-viable (depending on the approved treatment options available at the time of the detection). The party in care and control of an infested article or area would be responsible for arranging any treatments ordered and associated costs.

The approach described above to eradicate localized incursions would be taken during the early detection phase in an effort to slow the establishment of SLF in Canada, where control efforts on localized incursions are considered feasible and effective. These determinations may require consultation with relevant provincial authorities. Any regulatory control measures implemented at this stage are intended to be short term and would be removed once the localized incursion is deemed to have been rendered non-viable.

Should SLF be determined to have **established** within Canada (with confirmation of a reproducing population), While the detection of egg masses in the environment would be evidence of a reproducing population, there may be other factors that need to be considered to determine establishment. CFIA regulatory efforts would move towards slowing the spread of the pest and protecting non-infested areas of Canada. This would be accomplished through the establishment of regulated areas and implementation of domestic movement requirements to facilitate the movement high risk articles moving out of these areas while mitigating the risk of spread of SLF. During this stage of the response, the CFIA would no longer order treatment in areas where the pest is considered established and any requirements implemented domestically would need to be in alignment with any import requirements established for this pest. The management options being considered for the import and domestic pathways are outlined in the commodity specific management sections of this document.
In order to manage the movement of regulated articles and slow the spread of SLF should the pest establish within Canada, a series of regulatory tools can be used:

1. In the immediate stages following establishment, a *Notice of Prohibition of Movement* (NOP) would be issued for individual properties where SLF has been detected. Regulated articles would be defined on the NOP and movement of these articles out of the area defined on this notice would be prohibited without appropriate risk mitigation measures and written authorization of a CFIA Inspector. The use of an NOP would be recommended for the short term regulatory control of an area to reduce the immediate risk of spread and allow pest mitigation measures and to allow time for surveillance activities to occur where data can be gathered on pest distribution. As an infested area increases in size and the pest becomes more widely established, issuance of NOPs at the property level becomes less effective given the breadth of pathways through which the pest can travel beyond the individual property level and the amount of resources needed for CFIA to issue and manage individual notices; however, this tool

would be the most effective short-term domestic management option to provide movement controls for SLF within Canada while other long-term regulatory tools are being implemented.

2. Once a pest is considered established and the pest distribution is known, a Ministerial Order (MO) would be used to declare an area infested for SLF to manage the movement of regulated articles and slow the spread of the pest through human-mediated pathways. As opposed to regulating by NOP, regulation through an MO would permit regulated articles to move within a larger regulated area without restriction, while prohibiting their movement out of the regulated area without appropriate risk mitigation measures and written authorization of a CFIA Inspector. Due to the potential impacts of this pest, the likelihood of establishment in Canada once the pest is introduced and the need to act quickly to control the human-assisted movement of the pest, this is the recommended option for long-term domestic management of SLF within Canada.
3. Another strategy for establishing long-term domestic controls would be the implementation of a regulated area to manage the movement of regulated articles through the revision of Schedule II of the *Plant Protection Regulations* (PPR). This approach would function similar to an MO, but would allow for simplified updates as the pest distribution changes over time as they can be communicated through a published map as specified in S. 16 of the Plant protection Act. The initial amendments to add SLF to Schedule II of the PPR could be a lengthy process and would therefore be considered only for long-term regulatory control of SLF.

## Commodity specific management options

**Forestry products:**
There are over 100 potential host species, of SLF many of which are important forestry species. SLF is known to lay its eggs on or under the bark of live trees as well as on cut logs and lumber. Of these forest products, unprocessed and untreated logs with bark represent the highest risk for the introduction of SLF when no other risk mitigation measures are applied. Therefore, the following risk management options are being considered for the logs with bark pathway imported from the continental U.S.:

**Import requirement options for logs with bark:**

**Option 1**: No implementation of import requirements for logs with bark from areas infested with SLF. (Status quo)

PROS:
- Industry would continue to be able to trade without restrictions or additional phytosanitary requirements.

CONS:
- Increased risk of SLF being introduced to Canada earlier than would be expected through natural spread alone.
- Earlier establishment of the pest in Canada would lead to increased management costs for the forestry and horticulture industries, as these would need to be applied sooner than would be expected if import controls were in place to slow the spread of SLF.
- Potential negative trade implications and/or loss of market access to U.S. states or other countries where SLF is not established.

**Option 2:** Prohibit the importation of all logs with bark from areas infested with SLF.

PROS:

- Gives maximum protection and eliminates the risk of movement of the pest through the logs with bark pathway from areas where the pest has established.

CONS:

- Potential negative impact to trade and Canadian importers. Industry would not be able to import logs with bark from areas infested with SLF and established trade patterns may be lost
- Does not align with the phytosanitary principles of minimal impact and technical justification, as outlined in International Standards for Phytosanitary Measures (ISPM) No. 1 Phytosanitary principles for the protection of plants and the application of phytosanitary measures in international trade.
- Unjustified restrictions placed on industry and is a barrier to options for safe trade. Given that there are numerous pathways of human-assisted movement such as vehicles and inanimate objects which cannot feasibly be regulated, prohibiting the movement of logs with bark alone would not adequately address the risk of introduction.

**Option 3:** Allow for the importation of logs with bark from areas infested with SLF with a phytosanitary certificate attesting to freedom from SLF based on based on visual inspection or treatment or participation by a Canadian importer in a CFIA approved SLF risk mitigation program during the period of low risk prior to SLF egg hatch (January to April).

Logs being imported from states known to be infested with SLF would be permitted, provided they meet one of the certification options:

- A phytosanitary certificate, which includes the following AD:

  "The material was inspected and found free from spotted lanternfly, *Lycorma delicatula*."

OR

- A phytosanitary certificate, indicating in the treatment section that the material was treated to kill spotted lanternfly, *Lycorma delicatula*, including treatment details.
  - The material must be fumigated with methyl bromide at normal atmospheric pressure, at the rate of 48 g/m3 (3 lbs/1000 ft3) for 4 hours at 16°C (60°F), or at the rate of 64 g/m3 (4 lbs/1000 ft3) for 4 hours at 4.5 to 15.5°C (40 to 59°F **or**
  - The material must be heat treated to attain a minimum core temperature of 56°C for 30 minutes. The heat treatment process must be verified by the USDA, in accordance with the USDA-ALSC Heat Treatment Program for Export.

OR

During the low risk period prior to egg hatch (January to April) allow the importation of logs with bark from areas infested with SLF by CFIA-approved Canadian processing facilities without a phytosanitary certificate.

- A permit to import would be required

- Before a permit would be issued, a facility wishing to be recognized as an approved processing facility would need to develop a CFIA-approved Preventative Control Plan (PCP) which addresses storage, bark removal and disposal.
- All logs imported from areas infested with SLF would be required to have bark removed and processed prior to the start of the emergence of nymphs (by April 30)

In addition to the requirements above, tree species which are regulated for other quarantine pests by Canada would need to meet the requirements as stated in AIRS.

PROS:

- Eliminates the risk of movement (during high risk period) of the pest through the logs with bark pathway from areas where the pest has established.
- Reduces the regulatory burden on trading partners during a time of low risk of introduction.
- This option lowers the risk of introduction while maintaining some trade.

CONS:

- CFIA resources will be required to enforce additional import requirements related to this pest, but administration of these activities could be combined with other similar programs (eg. oak wilt, spongy moth).
- The Forest industry will have to develop an import program that is labor intensive to move products to areas where the pest has not established and a domestic program to move products from infested areas if the pest becomes established in Canada.
- Mills south of the St .Lawrence in Quebec rely on year round access to oak logs imported from the U.S. in order to operate. These oak logs are being imported from states where SLF is present. To date, phytosanitary certification by U.S. officials has not been possible for all oak logs. Therefore, these mills would be reliant on participation in the CFIA approved risk mitigation program and would be negatively impacted by a shortened import window.

**Option 4:** (Recommended) Allow for the importation of logs with bark from areas infested with SLF with a phytosanitary certificate attesting to freedom from SLF based on visual inspection or treatment or participation in a CFIA-approved SLF risk mitigation program throughout the entire year. This option is the same as option 3 but allows for year round importation of logs with bark without phytosanitary certification.

Logs being imported from states known to be infested with SLF would be permitted, provided they meet one of the following certification options:

- A phytosanitary certificate which includes the following AD:

  "The material was inspected and found free from spotted lanternfly, Lycorma delicatula."

OR

- A phytosanitary certificate indicating in the treatment section that material was treated to kill spotted lanternfly  Lycorma delicatula.", including treatment details.
    - The material must be fumigated with methyl bromide at normal atmospheric pressure, at the rate of 48 g/m3 (3 lbs/1000 ft3) for 4 hours at 16°C (60°F), or at the rate of 64 g/m3 (4 lbs/1000 ft3) for 4 hours at 4.5 to 15.5°C (40 to 59°F **or**
    - The material must be heat treated to attain a minimum core temperature of 56°C for 30 minutes. The heat treatment process must be verified by the USDA, in accordance with the USDA-ALSC Heat Treatment Program for Export.

OR

Allow importation of logs from areas infested with SLF by CFIA approved Canadian processing facilities to import forest products with bark attached through out the year.

- A permit to import would be required
- Before a permit would be issued, a facility wishing to be recognized as an approved processing facility would need to develop a CFIA approved Preventative Control Plan which addresses storage, bark removal and disposal. Logs would be required to have bark removed and processed in a timely manner.
- In addition the facility should be vigilant and visually examine log shipments upon arrival and immediately report suspect  SLF findings to a local CFIA office and treat the shipment in an authorised approved manner.

PROS:

- This option lowers the risk of introduction while maintaining trade.
- Provides technically justified control measures to slow the human assisted spread of the pest to Canada through the logs with bark pathway.
- Aligns with the phytosanitary principles of minimal impact and technical justification, as outlined in ISPM 1.
- Gives adequate protection and significantly reduces the risk of movement of the pest through the logs with bark pathway from areas where the pest has established.
- Gives two viable options for trade to continue .
- Could be linked to an existing PCP for another regulated pest (?)
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CONS:

- Does not give maximum protection nor completely eliminate the risk of movement (during high risk period) of the pest through the logs with bark pathway from areas where the pest has established.
- CFIA resources will be required to enforce additional import and domestic movement requirements related to this pest, but administration of these activities could be combined with other similar programs (eg. oak wilt, spongy moth).
- The Forest industry will have to develop an import program to move products to areas where the pest has not established and a domestic program to move products from infested areas if the pest becomes established in Canada.

**Domestic movement requirements for logs with bark:**

Given the risk of introduction and likelihood of establishment of SLF, the domestic movement requirements will be equivalent to the import option chosen for the logs with bark pathway and implemented only should this pest becomes **established** within Canada.

**Horticultural products**

Nursery stock is considered a high risk pathway for the movement of SLF from areas of infestation both into Canada and within Canada following pest establishment in Canada. It is thought to be the primary source of introduction of this pest into South Korea (CFIA 2021b, Kim et al. 2021). Compared with other types of plants for planting, nursery stock is considered to be the highest risk of being contaminated with SLF, as production occurs primarily outdoors, often in unprotected environments in smooth-sided pots, which are considered a suitable substrate for egg laying. While movement of nursery stock poses a risk of introduction and spread of SLF, this risk can be mitigated through a systems approach with a pest specific module or a targeted inspection program, as the insects themselves are highly visible and their egg masses are not difficult to detect if one knows what to look for and where to look (CFIA 2021b).

**Import requirements for nursery stock:**

In July 2021, the CFIA established import requirements for all nursery stock being imported from the continental U.S. as a measure to reduce the risk of spreading SLF through the nursery stock pathway following reports of pest movement on this pathway within the U.S. All nursery stock imported into Canada from the continental U.S. now requires one of the following additional declarations (AD) attesting to freedom from SLF on the phytosanitary certificate:

1) "The plants in this shipment have been officially inspected and found to be free from spotted lanternfly, *Lycorma delicatula*."

   OR

2) "The plants in this shipment have been produced exclusively in facilities or areas officially recognized by USDA-APHIS as free from spotted lanternfly, *Lycorma delicatula*."

   OR

3) "The plants in this shipment have been exclusively grown and stored in an enclosed structure which excludes spotted lanternfly, *Lycorma delicatula*."

The CFIA continues to recognize the U.S. – Canada Greenhouse-Grown Plant Certification Program (GCP) and the United States Nursery Certification Program (USNCP) as effective systems approaches for mitigating pest risk. The CFIA therefore continues to accept GCP labels and USNCP phytosanitary certificates in lieu of a phytosanitary certificate from exporting facilities in the U.S. where a pest module for SLF has been implemented. Additional declarations are not required for this material.

**Domestic movement options for nursery stock:**

Given the risk of introduction and likelihood of establishment of SLF, the following risk management options are being considered for the domestic nursery stock pathway when this pest become **established** within Canada:

**Option 1**: No implementation of domestic requirements for nursery stock in the designated regulated area when the pest is detected in Canada.

PROS:

- Industry would continue to be able to trade intra- and inter-provincially without restrictions or additional phytosanitary requirements.

CONS:

- Increased risk of SLF being introduced to non-regulated areas of Canada earlier than would be expected through natural spread alone.
- Earlier establishment of the pest throughout Canada would lead to increased management costs for the fruit tree, grapevine, and nursery industries, as these would need to be applied sooner than would be expected if domestic controls were in place to slow the spread of SLF.
- Potential negative trade implications and/or loss of market access to U.S. states where SLF is not established.
- Does not align with the basic phytosanitary principles of non-discrimination and managed risk, as outlined within ISPM No. 1. If this option were selected, CFIA would need to remove the import requirements on nursery stock from the U.S. once this pest became established within Canada. This would increase the risk of further introductions to other areas of Canada where the pest has not yet established through the import pathway.

**Option 2**: Prohibit the domestic movement of nursery stock out of a designated regulated area when the pest is established in Canada.

PROS:

- Eliminates the risk of movement of the pest through the nursery stock pathway from areas where the pest has established.

CONS:

- Does not align with the phytosanitary principles of minimal impact and technical justification, as outlined in ISPM 1. If this option were selected, import requirements for nursery stock from the U.S. would need to be aligned with domestic requirements and prohibited at a commensurate level.
- Unjustified restrictions placed on industry in areas where the pest has established, which does not align with the approach our U.S. trading partners have implemented. Given that there are numerous pathways of human-assisted movement such as vehicles and inanimate objects which cannot feasibly be regulated, prohibiting the movement of nursery stock alone would not adequately address the risk of spread.

**Option 3**: (Recommended) Allow for the domestic movement of nursery stock from a designated regulated area under a CFIA-issued movement certificate, provided it can be certified free from SLF using one of the following means:

1. Nursery stock would be eligible to move out of a regulated area if inspected by CFIA and found free from SLF. All shipments leaving the regulated area must be accompanied by a CFIA-issued domestic movement certificate (DMC) with the following AD:
"The plants in this shipment have been officially inspected and found to be free from spotted lanternfly, *Lycorma delicatula*."

To be eligible for inspection, the nursery stock material must have been produced and maintained at a facility that has a CFIA-approved SLF certification program in place to cover basic risk mitigation steps. Alternately, if SLF has been identified at a production site, the implementation of a preventative control plan (PCP) would also be required to ensure additional control measures are in place.

2. Nursery stock would be eligible to move out of a regulated area, provided the material was produced exclusively in a CFIA-approved screen house or alternate structure that precludes infestation by SLF. All shipments leaving the regulated area must be accompanied by a CFIA-issued DMC with the following AD:
"The plants in this shipment have been exclusively grown and stored in an enclosed structure which excludes spotted lanternfly, *Lycorma delicatula*."

3. Nursery stock would be eligible to move out of a regulated area if the material was grown exclusively indoors within a greenhouse where a SLF pest module is in place or in an alternate CFIA-approved manner that precludes infestation by SLF. All shipments leaving the regulated area must be accompanied by a CFIA-issued DMC with the following AD:
"The plants in this shipment have been produced exclusively in facilities or areas officially recognized by CFIA as free from spotted lanternfly, *Lycorma delicatula*."

For greenhouse-grown material, CFIA inspection of the material may be waived, provided the facility is able to demonstrate that the material was grown within the greenhouse for the entire duration of its life cycle.

Note that SLF requirements would apply only to nursery stock located within a regulated area. Domestic movement of material located outside of an SLF regulated area would not be subject to SLF requirements.

PROS:

- Provides technically justified control measures to slow the human assisted spread of the pest to the unregulated portion(s) of Canada through the nursery stock pathway.
- In alignment with current import requirements imposed on nursery stock from the U.S. and takes a similar regulatory approach as our U.S. trading partners.
- Requirements would be applied consistently within the import and domestic spaces based on the known distribution of the pest.
- Aligns with the plant protection principles of non-discrimination, managed risk, minimal impact and technical justification, as outlined in ISPM 1.
- Helps maintain trading partner's confidence in Canada's phytosanitary systems, potentially reducing impact on trade.
- The GCP and Canadian Nursery Certification Program (CNCP) programs allow for the implementation of modules to address pest-specific risk. This would allow for participating facilities to implement SLF risk mitigation measures into their current programs to facilitate both the domestic movement of product and export of material to the US.
- CFIA anticipates stakeholder support for this approach, as it is intended to delay the establishment of the pest in non-infested areas of Canada, providing for additional time for potential treatment options to become approved and for industry to develop best management practices.

CONS:

- The nursery industry would have to meet domestic movement requirements in areas where the pest has established, requiring a more labour-intensive systems approach for preventing the movement of potentially-infested nursery stock.
- CFIA resources will be required to enforce additional domestic movement requirements related to this pest, but administration of these activities could be combined with other existing programs (Japanese beetle, spongy moth, etc.), reducing the resource burden where pest presence overlaps.

## 6.0 Recommended Options

The following table summarizes requirements already established and options being considered as part of this RMD.

| Commodity | Import options | Domestic options |
|---|---|---|
| Nursery stock | **Requirements established 2021.**<br>• Allows for importation of nursery stock with a phyto attesting to freedom from SLF | 1. No implementation of domestic requirements and removal of import requirements.<br>2. Prohibit domestic movement from regulated areas of Canada.<br>3. Allow for domestic movement with a movement certificate **(Recommended)** |
| Logs with bark | 1. No import requirements<br>2. Prohibit all log imports from SLF infested areas<br>3. Allow importation with a phyto or with participation in a CFIA approved risk mitigation program only during the low risk period (January – April)<br>4. Same as option 3 but allow importation with participation in a CFIA approved risk mitigation program year round. **(Recommended)** | Same options as outlined for import. Domestic measures will be commensurate with the import option selected following consultation. |
| All other pathways and products | No pathway or commodity specific requirements. As a regulated pest, import of the pest is prohibited. | No pathway or commodity specific requirements. As a regulated pest, domestic movement of the pest is prohibited. |

SLF is currently absent from Canada. Due to the proximity of the pest to Canada and the numerous possible pathways of entry, the risk of introduction to Canada is considered to be very high. Once introduced, SLF is predicted to be a major pest for Canada's grape and fruit tree industry with negative impacts on the nursery and forestry sectors. Based on these considerations and the risk assessment data, the CFIA recommends the following options for the highest risk commodity pathways in order to prevent the introduction to Canada and slow the spread of SLF and protect non-infested areas of Canada should the pest become established:

**Horticultural products - Option 3**: Align domestic requirements with current import requirements for U.S. origin nursery stock and allow for the movement of material from a designated regulated area under a CFIA-issued movement certificate, provided the material can be certified free from SLF.

**Forestry products - Option 4:** Permit importation of logs from areas infested with SLF based on based on visual inspection or treatment and/or participation in a CFIA-approved SLF risk mitigation program throughout the year. Align domestic movement requirements for the movement of logs with bark from

a designated regulated area under a CFIA-issued movement certificate, provided the material can be certified free from SLF.

## 7.0 Consultation and next steps

Stakeholders will have an opportunity to comment on the proposal from December 19, 2022 to February 3, 2023. Once feedback from stakeholders has been received, the CFIA will consider the comments and determine the most appropriate option. After a risk management decision has been finalized, the CFIA will revise this document to include information about the decision and next steps for implementing the adopted approach.

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