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PLANT SCIENCE SCAN

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BACKGROUND: The Plant Health Science Division of the Canadian Food Inspection Agency routinely scans external sources to identify information that might be of possible regulatory significance or interest to Canada's national plant health. This Plant Science Scan report was prepared by the Canadian Food Inspection Agency's staff as a mechanism to highlight potential items of interest, raise awareness and share significant new information related to plant health.

Index of Articles

Numbered squares correspond to numbered articles

Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments
Canada

Pathology

1 New Disease: *Erwinia uzenensis*, a new bacteria species described from Japan

In 2007, black lesions were observed on young shoots of European pear (*Pyrus communis*) in an orchard in Kaminoyama City, Yamagata Prefecture Japan. Molecular, biochemical and phenotypic characterizations allowed for the identification of a new species, *Erwinia uzenensis* sp. nov. The symptomology associated with infection of this pathogen is similar to some of the symptoms of fireblight. This report did not contain any additional information on the biology, host range, distribution or economic importance of this species.

Pyrus spp. are grown in Canada for ornamental and horticultural purposes. *Erwinia uzenensis* is not regulated by Canada.

SOURCE:

Matsuura, T., A. Mizuno, T. Tsukamoto, Y. Shimizu, N. Saito, S. Sato, S. Kikuchi, T. Uzuki, K. Azegami, and H. Sawada. 2011. *Erwinia uzenensis* sp. nov., a novel pathogen that affects European pear trees (*Pyrus communis* L.). International Journal of Systematic and Evolutionary Microbiology. Published online ahead of print October 10, 2011, DOI: 10.1099/ijs.0.032011-0
http://ijs.sgmjournals.org/content/early/2011/09/29/ijs.0.032011-0.abstract

2 Update: *Phytophthora ramorum* diseases in the United Kingdom and North America

Phytophthora ramorum is the oomycete pathogen that causes a disease known as Ramorum Blight and Leafdrop on a wide variety of nursery plants. *Phytophthora ramorum* has recently been identified affecting larch trees (*Larix* spp.) in two new locations in Great Britain. This host appears to be suitable for high levels of *P. ramorum* sporulation. Two larch woodlands, one near Lancashire, England, the other on the island of Mull, Scotland, were discovered to have outbreaks of the disease. In both of these regions, host plants such as rhododendrons were identified as potential sources of the pathogen.

In southwestern Oregon, USA, a 162 square-mile quarantine zone was established in an effort to manage an outbreak of *P. ramorum* in Curry Country. However, Oregon forestry officials have recently found infected trees more than six miles north of the quarantine zone highlighting the challenges in managing this disease in the natural environment.

In addition, a new host has been reported for *Phytophthora ramorum*. During a routine inspection for light brown apple moth, *Molinadendron sinaloense* was found to be infected with *P. ramorum* in Alameda County, California, USA, in 2011. This was the first known report for this host-pathogen association.

Phytophthora ramorum is a quarantine pest in Canada and the CFIA conducts annual surveys to monitor for its presence. It has, in the past, been detected in nurseries in southern British Columbia, where it has been eradicated.

SOURCES:

Horticulture Week, July 2011: *Phytophthora ramorum* found in Lancashire and Mull larches.
http://www.hortweek.com/news/1081205/Phytophthora-ramorum-found-Lancashire-Mull-larches/

California Oak Mortality Task Force Report, September 2011: Nurseries.
http://www.suddenoakdeath.org/wp-content/uploads/2011/09/COMTF-Report-September-2011.pdf

The Oregonian, October 2011: Oregon officials find new cases of Sudden Oak Death six miles north of quarantine zone.
http://www.oregonlive.com/pacific-northwest-news/index.ssf/2011/09/oregon_officials_find_new_case.html

3 Update: Groundnut ringspot tospovirus on tomato, pepper and other crops in Florida

In 2009, Groundnut ringspot tospovirus (GRSV) was found for the first time in North America on tomato (*Solanum lycopersicum*) crops in the Homestead area of Florida. This virus is native to South Africa where it is found on groundnut (peanut - *Arachis hypogaea*) and, more recently, on soybean (*Glycine max*). In the mid 1990's the virus was reported on tomatoes in South America. Since its discovery in Florida, the virus has spread to scattered locations throughout southern Florida where it has been found on tomato, pepper,

eggplant, and tomatillo (all members of the Solanaceous family). According to this recent report, infections in Florida tomato crops appear to be sporadic, where only about 2-3% of plants become infected.

GRSV appears to be similar in many ways to the closely related Tomato spotted wilt virus (TSWV). Both viruses cause similar symptoms on tomato and are vectored by the western flower thrips, *Frankliniella occidentalis*. In the United States, research on the distribution, host range and biology of this newly introduced virus is on-going. Thrips and TSWV are common problems throughout North American greenhouse production and research to date suggests that the integrated management options for controlling TSWV should also help to minimize loses from GRSV.

SOURCE:
The Grower, December 2011: Keep eyes peeled for new pepper, tomato virus.
http://www.thegrower.com/issues/citrus-vegetable/Keep-eyes-peeled-for-new-pepper-tomato-virus-135068353.html

4 Update: '*Candidatus* Liberibacter solanacearum', Zebra Chip of potato

'Candidatus Liberibacter solanacearum', a gram negative bacterium, is the causal agent of Zebra Chip (ZC) disease in potatoes (*Solanum tuberosum*). It also causes damage to tomato (*Solanum lycopersicum*) and pepper (*Capsicum annuum*) crops and has been reported from carrot (*Daucus carota*) in Europe. This pathogen is vectored by the tomato/potato psyllid (*Bactericera cockerelli*). It causes a frying defect in infected chipping potatoes consisting of unattractive dark stripes (thus 'Zebra'), rendering the potato unmarketable. Over the last decade ZC has emerged as a major economic threat to processing potato production in the southwestern USA, Mexico, Central America and New Zealand. In the USA, the 2011 growing season saw a northward expansion of the disease, with the ZC defect being reported for the first time in the Pacific Northwest and Idaho.

ZC has not been reported from Canada and is not currently regulated by Canada. The psyllid vector of ZC has occasionally been reported from different areas of Canada at the tail-end of the growing season but late season infection of potato is unlikely to result in ZC symptoms and consequent economic loss. The inability of the psyllid to overwinter in cooler areas combined with late arrival of psyllids in the Pacific Northwest (and Canada) is believed to limit the damage potential of the bacterium in these areas.

SOURCE:
The Grower, November 2011: Zebra chip discovery in Pacific Northwest spuds raises questions.
http://www.thegrower.com/issues/the-grower/Zebra-chip-discovery-in-Pacific-Northwest-spuds-raises-questions-134151978.html

5 Spread: *Monilinia* species causing Brown Rot in Europe and China

Brown rot fungi cause some of the most economically important diseases of apple, pear and stone fruits. *Monilinia fructicola* and *Monilinia laxa* occur in North America where they cause blossom and twig blight and fruit rot. Two other species of brown rot fungi, *Monilinia fructigena* and *Monilia polystroma*, are not known to occur in North America and are regulated by Canada as quarantine pests. *M. fructigena* is primarily found in Europe and Asia, while *M. polystroma*, a newly described species that is closely related to *M. fructigena* was, until recently, only known from Asia.

Recent reports in Europe indicate that *M. polystroma* has now been found for the first time in the Czech Republic on apple (*Malus domestica*) and peach (*Prunus persica*). The fungus has also been found for the first time on apricot (*Prunus armeniaca*) in Switzerland. Prior to these reports, in Europe, the fungus had only been known from Hungary.

In China, recent phylogenetic and morphological characterizations of brown rot fungi found there on *Prunus persica* identified three fungal species associated with brown rot: *M. fructicola*, *Monilia mumecola*, and a previously undescribed species, *Monilia yunnanensis*. Molecular sequence analysis showed that *M. yunnanensis* was most closely related to *M. fructigena*, and distantly related to *M. polystroma*. Both *M. fructicola* and *M. polystroma* had been reported from China previously, while *M. mumecola* had been reported from Japanese apricot (*Prunus mume*) in Japan.

SOURCES:
Hu, M.-J., K.D. Cox, G. Schnabel and C-X Luo. 2011. *Monilinia* species Causing Brown Rot of Peach in China. PLoS ONE 6(9): e24990. DOI:10.1371/journal.pone.0024990 http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0024990

Hilber-Bodmer, M., V. Knorst, T. H. M. Smits and A. Patocchi. 2011. First report of Asian brown rot caused by *Monilia polystroma* on apricot in Switzerland. Plant Disease Vol. 96(1): 146

EPPO Reporting Service No. 6, Paris 2011-06-01. 2011/134. First reports of *Monilia polystroma* in Hungary and the Czech Republic.

Leeuwen, G.C.M., R.P. van Baayen, I.J. Holb and M.J. Jeger. 2002. Distinction of the Asiatic brown rot fungus *Monilia polystroma* sp. nov. from *M. fructigena*. Mycological Research 106(4): 444-451

Zhu, X.Q. and L.Y. Guo. 2010. First report of brown rot on plum caused by *Monilia polystroma* in China. Plant Disease 94(4): 478

Harada, Y., S. Nakao, M. Sasaki, Y. Sasaki, Y. Ichihashi and T. Sano. 2004. *Monilia mumecola*, a new brown rot fungus on *Prunus mume* in Japan. Journal of General Plant Pathology Vol. 70(6): 297-307

6 Spread: First report of Tomato torrado virus from Colombia

In 2008, tomato plants (*Solanum lycopersicum*) grown in plastic greenhouses near Bogota, Colombia, began to show symptoms of virus infection. Infected plants showed necrosis beginning at the base of the leaflets surrounded by yellow areas. Using various serological and molecular methods, Tomato torrado virus (ToTV) was identified as the causal agent of the disease. This is the first report of ToTV from Colombia.

Infected plants for planting may be a pathway for this virus. Research from Australia suggests that this virus is not transmitted through seed collected from known ToTV virus-infected tomato plants. The USDA-APHIS recently developed regulations to prevent the introduction of both ToTV, and another whitefly-transmitted virus, Tomato severe leaf curl virus (ToSLCV). This first report of ToTV from Colombia adds to the growing list of countries where the virus has been reported (Australia, France, Hungary, Italy, Panama, Poland and Spain).

SOURCES:
Verbeek, M. and A.M. Dullemans. 2012. First Report of Tomato torrado virus Infecting Tomato in Colombia. Plant Disease. 96(4): 592

Gambley, C.M., J. E. Thomas, D. M. Persley and B. H. Hall. 2010. First Report of Tomato torrado virus on Tomato from Australia. Plant Disease. 94(4): 486

Biotechnology

7 First report: Western Corn Rootworm, *Diabrotica virgifera,* developing Field-Evolved Resistance to transgenic *Bt* Maize

Corn rootworm species (*Diabrotica* spp.) are among the most serious pests of maize in the United States. They have demonstrated a remarkable adaptability to pest management strategies, including conventional insecticides and crop rotation. The first occurrence of field-evolved resistance to maize-expressed transgenic *Bacillus thuringiensis* (*Bt*) toxin by the western corn rootworm (*Diabrotica virgifera*) was recently reported in Iowa. Laboratory testing revealed that *D. virgifera* samples, isolated from *B*t maize fields displaying severe rootworm damage, had significantly higher survival in a *Bt* maize bioassay compared to *D. virgifera* samples isolated from fields displaying no rootworm damage. The authors suggest that the insufficient planting of refuge plants may have contributed to the development of *Bt* resistance.

Since 2003, the CFIA has authorized the unconfined environmental release of a number of transgenic maize plants expressing *Bt* toxins that target rootworm feeding. In order to minimize the likelihood of resistance development of rootworm to the *Bt* toxins, the CFIA requires the implementation of an insect resistance management (IRM) plan. A key component of the IRM plan is ensuring that a percentage (typically 20%) of the rootworm population develops on non-*Bt* maize plants called “refuge”. Currently, there is no evidence of *Bt* resistant populations of western corn rootworm in Canada. This is likely related to the CFIA’s continued verification and enforcement of refuge compliance rates, as well as a decrease in western corn rootworm pressure in Canada.

SOURCE:
Gassmann, A.J., J.L Petzold-Maxwell, R.S. Keweshan, and M.W. Dunbar. 2011. Field-evolved resistance to *Bt* maize by western corn rootworm. PLoS ONE 6(7): e22629. DOI:10.1371/journal.pone.0022629. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0022629

8 First Report: Herbicide resistant Kochia weed, *Bassia scoparia*, found in Alberta

Glyphosate is a herbicide of choice for many producers as it controls a broad-spectrum of weeds and is affordable. However, an increased selection pressure for resistant weed biotypes is created when such a herbicide is used repeatedly without other weed management practices. Over time, this can result in a weed population that is resistant to the herbicide since the resistant plants are the only ones that survive and reproduce. In Canada, the third case of glyphosate resistance, glyphosate-resistant kochia (*Bassia scoparia*), has been confirmed in southern Alberta (glyphosate-resistant giant ragweed and glyphosate-resistant Canada fleabane have previously been confirmed in southwestern Ontario). The resistant plants were found on three chem-fallow fields (i.e. fields that were free of vegetation for the growing season by means of herbicides to control weeds). It is not certain if the resistance was selected in these fields or if the seeds blew in from another region, however producers do have other valuable herbicide options to control these resistant biotypes.

The CFIA conducts risk assessments for the unconfined release of plants with novel traits (PNTs). For PNTs that express a herbicide tolerance trait, a herbicide tolerance management (HTM) plan is required. HTM plans are designed to delay weeds and species related to a herbicide-tolerant crop plant from developing tolerance to herbicides. HTM plans are also designed to address the occurrence of herbicide tolerant volunteers and volunteers with resistance to multiple herbicides. The economical and broad-spectrum weed control of glyphosate renders it a tool of choice for many production practices including chem-fallow weed control, no-till burndown, and Roundup Ready® crops. Therefore, management plans together with production practices are essential to ensure continued efficacy of this important product.

SOURCE:
The Western Producer: Yates, D. and M. Raine. January 2012. Resistant kochia discovered. http://www.producer.com/2012/01/resistant-kochia-discovered%E2%80%A9/

Entomology

9 New Pest: The gall midge, *Dasineura heterophylla*, is reported as a new species from China

Recently, a new species of gall midge, *Dasineura heterophylla*, attacking hazelnut trees (*Corylus* spp.) was reported in Liaoning province, China. The galls were found on many tissues of the trees including leaves, leaf buds and bracts of young hazel fruit. Of the various *Corylus* species carrying galls reported in this study, *C. heterophylla* appears to be the predominant host preference of this pest. This gall midge has caused considerable economic losses in China, with over 40% reduction in fruit set in some years.

Hazelnuts are an important part in the Canadian landscape as a cultivated crop but also in the natural environment as an important source of food for wildlife. British Columbia, in particular, is home to a number of important hazelnut plantations. In Canada, *D. heterophylla* is currently not a regulated pest.

SOURCE:
Jiao, K., W. Bu, and C. Liu. 2011. A new species of gall midge (Diptera: Cecidomyiidae) attacking hazels, *Corylus* spp. in China. Entomologica Fennica 22: 113-120

10 Update: Asian Longhorned Beetle, *Anoplophora glabripennis*, in North America and Europe

The Asian Longhorned Beetle (ALHB), *Anoplophora glabripennis,* is an invasive species that attacks healthy trees, particularly maples (*Acer* spp.). Recent reports

from Europe indicate that it has been identified in Switzerland, adding to the list of known European countries in which this beetle has been found (including France, Austria and Germany). In North America, Ohio (Bethel County) was recently identified as the fifth state in which ALHB has been detected: Massachusetts, New Jersey, and New York, (Illinois - considered eradicated in 2008).

ALHB was recently reported to have expanded from urban settings to close-canopied forests in Massachusetts. The enormous quarantine zone in Massachusetts, a 243 square kilometre area, included urban parks, neighbourhoods and natural forests. This article suggests that contrary to previous assumptions, ALHB can also become a pest of dense, close-canopied forests and would not be confined to urban and disturbed environments.

ALHB is considered a quarantine pest in Canada, first detected in 2003 in Vaughan and Toronto, Ontario. A quarantine zone and eradication strategy have been implemented to manage the infestation in these areas and annual surveys for this pest have not detected any new insects in the quarantine zone since 2008.

SOURCES:

Swissinfo.ch, Swiss news, September 2011: Asian beetle pest turns up in Switzerland.
http://www.swissinfo.ch/eng/news_digest/Asian_beetle_pest_turns_up_in_Switzerland.html?cid=31192324.

Dodds, K. and D.A. Orwig. 2011. An invasive urban forest pest invades natural environments — Asian longhorned beetle in northeastern US hardwood forests. Canadian Journal of Forest Research 41: 1729 - 1742
http://www.nrcresearchpress.com/doi/pdf/10.1139/x11-097

USDA-APHIS-PPQ News Alert 2011: Federal and State Officials Announce Tree Survey Efforts in Ohio Due to the Discovery of Asian Longhorned Beetle.
http://www.aphis.usda.gov/newsroom/2011/06/adult_detection_ALB.shtml

11 Spread: Box tree moth, *Cydalima perspectalis*, spreading in Europe

The box tree moth, *Cydalima perspectalis* is a known serious defoliator of Boxwood (*Buxus* spp.) and could impact horticulturally grown *Buxus sempervirens* in North America. This pest was first reported present in Europe by the German NPPO in 2007 and has since spread to neighbouring countries. At high population levels this pest can severely defoliate and kill its host. *Ilex* spp. and *Euonymus* spp. plants are alternate hosts in Asia.

The *Buxus* spp. trade in North America is economically important and may be hampered by the introduction of this pest.

SOURCES:

Mally, R. and M. Nuss. 2010. Phylogeny and nomenclature of the box tree moth, *Cydalima perspectalis* (Walker, 1959) comb. n., which was recently introduced into Europe (Lepidoptera: Pyraloidea: Crambidae: Spilomelinae). Eur. J. Entomol. 107: 393-400

Korycinska A. and D. Eyre. 2011. The Food and Environment Research Agency - Plant Pest Factsheet: Box Tree Moth, *Cydalima perpsectalis*
http://fera.defra.gov.uk/plants/publications/documents/factsheets/boxTreeCaterpillar2011.pdf

EPPO Reporting Service No. 11, Paris 2007-11-01. 2007/215. Incursion of *Diaphania perspectalis* in Germany and addition to the EPPO Alert List.

12 New Pest: Zigzag elm sawfly, *Aproceros leucopoda*, an emerging pest of urban elms in Central Europe

The zigzag elm sawfly, *Aproceros leucopoda*, is an invasive insect that feeds exclusively on elms (*Ulmus* spp.) and can cause severe defoliation damage. It is an outbreak, temperate deciduous forest species and reproduces parthenogenetically (asexually) with up to 4 generations per year in temperate regions of the world. Global distribution of *A. leucopoda* includes various regions in China (Gansu) and Japan (Hokkaido, Honshu) and it has also been introduced into eastern and central parts of Europe including Italy. Feeding larvae are usually present in each of the peak growing season months (May, July, August and September). Urban environments provide suitable hosts for all stages of the insect and it is well-adapted to overwinter in temperate deciduous forests. *Aproceros leucopoda* is a strong flier and can disperse locally. It is known to move by human-assisted means on plants for planting.

Aproceros leucopoda may be of concern to Canadian urban landscapes. In Canada, it is considered a non-regulated pest. Although there are no known reports of *A. leucopoda* in North America, a potential pathway

into Canada exists on *Ulmus* spp. plants for planting from Europe and parts of Asia.

SOURCE:
Zandigiacomo, P., E. Cargnus, and A. Villani. 2011. First record of the invasive sawfly *Aproceros leucopoda*, infesting elms in Italy. Bulletin of Insectology 64: 145-149

13 Update: Light Brown Apple Moth, *Epiphyas postvittana*, hosts

The Light Brown Apple Moth, *Epiphyas postvittana*, a native of Australia, has recently been introduced to North America via California. A recent field survey in an urban region of the San Francisco Bay Area reported on the host plants used by the Light Brown Apple Moth (LBAM). Results from the survey indicated that 75 of the 152 host species inspected for LBAM, 34 were previously unknown as suitable hosts. Further to this, most host plants identified were not native to Australia.

This paper indicates that ornamental shrubs have high potential for transporting LBAM into Canada through the nursery trade. Herbs or near-relatives of commercial herbs (mint: *Mentha arvensis* and rosemary: *Rosmarinus officinalis*) are also commonly-infested hosts that find wide distribution as fresh products in Canada. New hosts plants are continually being identified for this moth, showing that the full nature of its polyphagy is still unknown. Many native Californian parasitoids have also adopted this moth as a host. The authors believe that parasitism is helping suppress populations of this moth, so it would seem that not only is the moth able to colonize new hosts, but it is also proving to be a new host for colonizing native parasitoids.

SOURCE:
Wang, X.G., K. Levy, N.J. Mills, and Daane, K.M. 2012. Light Brown Apple Moth in California: A Diversity of Host Plants and Indigenous

Parasitoids. Environ. Entomol. 41(1): 81-90 DOI: http://dx.doi.org/10.1603/EN11160

14 Spread: First Report of Tomato Leaf Miner Moth, *Tuta absoluta*, from England

A first report of *Tuta absoluta* flying free in the countryside in England near the town of Evesham was recently published. This moth is known to enter greenhouses from the environment and now it has been shown to exit and distribute from them up to one and a half miles. Tomato Leaf Miner Moth has also been reported from both Austria and Croatia. It has entered growing facilities in Croatia, but was only found in trading warehouses in Austria.

Given this recent information, infested greenhouses could become the source for a wider infestation in the summertime without other greenhouses having to receive infested materials. Transfer to outdoor-grown tomatoes is also possible. In Canada, however, it is still regarded as unlikely that the moth will overwinter outside of greenhouses.

SOURCES:
EPPO Reporting Service No. 11, Paris 2011-11-01. 2001/236. First report of *Tuta absoluta* in Croatia. http://archives.eppo.org/EPPOReporting/2011/Rse-1111.pdf

EPPO Reporting Service No. 11, Paris 2011-11-01. 2001/237. First report of *Tuta absoluta* in Austria. http://archives.eppo.org/EPPOReporting/2011/Rse-1111.pdf

Clement, P. 2012. One to watch out for: *Tuta absoluta* (Meyrick) (Lep.: Gelechiidae) apparently free-flying in Worcestershire. Entomologist's Rec. J. Var. 124: 13

15 Update: *Xylotrechus arvicola* is an emerging European grape pest

Xylotrechus arvicola is a long-horned beetle currently causing damage to the Spanish grape (*Vitis* spp.) industry. *X. arvicola* is a polyphagous species that inhabits dead and decaying wood of broadleaf trees from Portugal through Kazakhstan, going as far north as Estonia and northern Russia. The spread and occurrence of the pest in Spain seems favoured by the expansion of grape cultivation, the importation of planting materials, restrictions in the use of pesticides and absence of winter cold.

Xylotrechus larvae have been intercepted in the past by Canada in wood, crates and containers. Recently, the USDA reported on intercepting a related species *Xylotrechus chinensis* in non-compliant wood packaging material from China suggesting that the genus can move in non-horticultural trade. The Canadian grape industry could be impacted by the introduction of this pest into Canada.

SOURCE:
García-Ruiz, E., V. Marco, and I. Pérez-Moreno. 2012. Laboratory rearing and life history of an emerging grape pest, *Xylotrechus arvicola* (Coleoptera: Cerambycidae). Bulletin of Entomological Research 102: 89-96

Culbreth, T. 2012. Invader of the month: An Unreasonable Facsimile – Japanese Angelica Tree. Invasive Species of Concern in Maryland. Online. http://www.mdinvasivesp.org/invader_of_the_month.html

Moore, G., S.D. Glenn, and L. Ma. 2009. Distribution of the native *Aralia spinosa* and non-native *Aralia elata* (Araliaceae) in the northeastern United States. Rhodora 111(946): 145-154

Botany

16 Update: Japanese Angelica Tree, *Aralia elata*, an invasive look-alike spreading in North America

Japanese angelica tree, *Aralia elata*, is highlighted as an invasive species in forests of the northeastern United States. *A. elata* is a woody, shade-tolerant plant that closely resembles the native Hercules' Club (*Aralia spinosa*). The presence of this native look-alike provided the 'background noise' that has enabled *A. elata* to infiltrate forest habitats in the eastern U.S. almost unnoticed. Recently reported out-of-range records for *A. spinosa* have been based almost entirely on misidentified collections of *A. elata*.

This species could easily become established in forested areas of southern Ontario and Quebec. It has been introduced into Ontario, although it is unclear if there are established populations outside cultivation. Some of the most concerning invasive plant species in Canada are those that can grow in the forest understory and that are spread by birds feeding on their berries. *A. elata* has both of these characteristics. This makes it similar in its biology to the introduced invasive buckthorn species (*Rhamnus cathartica* and *Frangula alnus*), which have become very common in Ontario forests in recent years. *A. elata* can also spread locally by root suckers. This is a species that might be of concern to Canada as a potential invasive weed in forests.

SOURCES:
CFIA and CFS 2011. Plants of Canada Database. Canadian Food Inspection Agency and Canadian Forest Service. http://www.plantsofcanada.info.gc.ca/ [February 2012]

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