



Friends of the Central Experimental Farm

Spring 2021 Newsletter

Volume 33 No. 2

Invasive Species at the Farm

By Julianne Labreche

Unfortunately, the Central Experimental Farm is not immune to invasive species. Across North America today, invasive species of plants, insects, fish and invertebrates pose a serious threat to our wild spaces, waterways and farmland. Some experts say that next to habitat loss, invasive species – sometimes called ‘aliens’ – are our most significant threat to biodiversity.

The Dreaded Dog-strangling Vine

As a volunteer gardener at The Farm, I was first introduced to invasive plant species on-site in the Macoun Memorial Garden. Dog-strangling vine (*Vincetoxicum rossicum*), or DSV, is a perennial spreader with its origins in southern Europe. Being a dog lover, I was relieved to learn that DSV does not harm dogs. Being a plant lover however, I was horrified to learn that it is an aggressive spreader. One plant can produce 28,000 seeds per square metre.

Dog-strangling vine was first introduced in the northeastern United States in the mid-1800s for use in gardens, even though it has few redeeming qualities. It even confuses Monarch



Dog-strangling Vine



Japanese Beetles

R. Hinchcliff

butterflies that lay eggs on it, because it looks like their host plant milkweed, yet provides no food for its caterpillars. Other, more experienced, volunteers showed me how to cut the plant off at its base to stop the plant from climbing, spreading and going to seed. We knew it was a temporary solution at best.

“We try to manage the DSV by pruning the stem at ground level to discourage photosynthesis,” says Denise Kennedy, team leader in the Macoun garden. That worked well for a couple of years, until 2020. Since then, with the pandemic, volunteers have not been working in the gardens. When they return, undoubtedly, DSV will await their arrival.

Canada Thistle at the Shelterbelt

DSV is only one of many invasive species in the Ornamental Gardens. The Shelterbelt is a recreational path along the western edge of the Farm, planted with a variety of native and non-native trees and shrubs. Shelterbelt team leader Polly

McColl says that her team works to weed out several types of invasive plants, among them, Canada thistle (*Cirsium arvense*).



Canada Thistle

Richard Bartz

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Dormancy is Temporary

Unlike us, trees and shrubs can go into a lifeless state for months when conditions aren't right for a thriving existence. Deciduous trees drop their leaves and go dormant, waiting for the hard days to pass. Evergreen trees pack their cells with chemicals to keep unwanted energy created by their still-active chlorophyll in check.

Trees with bare limbs and twigs in winter look dead. But they aren't, they're wrapped from top to bottom by a sheath of living cells that have been carefully modified for this period. The cells have become more padded and flexible to protect the cell contents from the effects of freezing temperatures.

The trees also add sugar to the cells to help resist the cold. The sugar lowers the freezing point of the water in the cells.

When water outside the cells freezes, it gives off a little heat that helps to warm the cells. Also, water leaks out of the cells as the temperatures go down, dropping the freezing point even further.

In spring the trees can reverse the process, coming back to life as if winter never happened.

Like the trees, the Friends of the Farm have been in a suspended state for some time now due to Covid-19. We haven't been able to do volunteer work in the Ornamental Gardens, Shelterbelt, and Arboretum for over a year. Some may wonder if we are still alive.

I'm pleased to report that the Friends have not ceased to be. The Board has been working on projects such as tours of the Gardens and Arboretum, as well as a new book about the Farm, and possibly a new

event. We hope some of these will come to fruition this year. If you would like to be involved with a project, let us know and we'll find one that fits your interests and abilities. Or you can even suggest a new initiative.

But we do understand that volunteer gardening work is at the core of who the Friends are. While it's uncertain at the time of writing when we might be back in the gardens, we will be ready when that happy day occurs. We'll be in touch as soon as we hear that volunteer restrictions have changed.

The good news is that it's temporary. We won't be dormant forever!

Eric Jones
President



Période de dormance temporaire

Contrairement à nous humains, les arbres et arbustes peuvent se retrouver dans un état végétatif ou dormant pendant bien des mois lorsqu'ils sont soumis à des conditions de vie non propices à leur plein épanouissement. Les arbres à feuillage caduc perdent leurs feuilles et entrent en période de dormance jusqu'à ce que les jours sombres et froids viennent à passer. Les conifères gavent leurs cellules de produits chimiques afin d'exercer un contrôle sur l'énergie non désirée, mais toujours active de la chlorophylle.

Les arbres aux branches et brindilles nues nous paraissent inertes en hiver. Ils plongent dans un état de dormance, recouverts des racines à la cime d'une enveloppe de cellules vivantes qui ont été modifiées avec soin en vue de cette étape. Les cellules bénéficient d'un rembourrage plus épais et souple, les protégeant des effets du gel.

De plus, l'addition de sucre dans les cellules des arbres aide à résister aux températures froides. Le sucre contribue à

abaisser le point de congélation de l'eau dans les cellules. À l'extérieur de celles-ci, lorsque l'eau atteint le point de gel, elle laisse échapper un peu de chaleur qui réchauffe les cellules. De plus, en s'échappant des cellules lorsque la température baisse, l'eau contribue à faire baisser davantage le point de gel.

Au printemps, les arbres vont renverser le processus, revenant à la vie tout comme si l'hiver n'avait pas eu lieu.

À l'instar des arbres, les Amis de la Ferme ont été tenus dans un état d'attente depuis un certain temps déjà en raison de la COVID-19. Pendant plus d'un an, nous n'avons pu accomplir les tâches dans le cadre de notre bénévolat, que ce soit dans les Jardins ornementaux, le brise-vent et l'Arboretum. Certains, à juste titre, se demanderont si nous existons toujours.

Je suis heureux de vous apprendre que les Amis sont toujours là. Le conseil d'administration s'est penché sur des projets réalisables, soit des visites dans les Jardins ornementaux, soit un nouveau livre sur le thème de la Ferme ou même une toute

nouvelle activité. Nous avons bon espoir que ces projets se réaliseront cette année. Si vous désirez y participer, nous vous invitons à nous en faire part et nous saurons trouver un projet à la mesure de vos passions et de vos compétences. Vous pourrez même proposer une nouvelle initiative!

Toutefois, nous sommes bien conscients que le travail des bénévoles dans les jardins demeure le pivot de la mission ou de la raison d'être des Amis. Au moment d'écrire ces lignes, il s'avère bien difficile de définir le temps précis du retour dans les jardins. Pourtant, une chose demeure certaine : nous serons prêts quand apparaîtra ce jour tant attendu. Nous communiquerons de nouveau avec vous dès que nous recevrons le feu vert signalant la reprise des activités de bénévolat.

Bonne nouvelle : cette situation est temporaire! Qui veut demeurer en état de dormance à perpétuité!

Eric Jones
Président

Invasive Species at the Farm ... (continued from Page 1)

Ironically, despite its Canadian name, this thistle is not a native plant, nor is it a welcome visitor. The plant has its origins in Europe and western Asia, accidentally introduced into North America in the 1600s. Since then, it has continued to spread, often in areas of disturbed soil, including logged forests and pastures. Canada thistle has a long, deep, fibrous taproot that produces a network of lateral roots. It is almost impossible to pull out— at least, in my experience. Like so many invasive plants, its seeds are prolific, as many as 1,500 per flowering shoot.

Another invasive plant species that the Shelterbelt volunteers try to keep under control is Black Medic (*Medicago lupulina*). It is an annual that first originated in Africa, Asia and Europe, growing quickly to form large colonies. “We dig it up in the area where the plaques are located,” says McColl. “The area where the daylilies are found also is full of it.”



Adair Heuchan (Inset: Sharon Saunders)

Star of Bethlehem

Star of Bethlehem in the Rock Garden

Over in the Rock Garden, team leader Annie Creighton considers Star of Bethlehem (*Ornithogalum umbellatum*) invasive and hard to eliminate completely. “When weeding, we just try to get as many as we can,” she says. The plant is so named because of its white star-shaped flowers. It is a gardener’s bane, difficult to get rid of once established in a bed or lawn because of its fast spreading, tiny bulbs. Like all invasive plants, it comes from faraway, a native of the Mediterranean region and a member of the lily family.

Some beds in the Ornamental Gardens at the Farm stay relatively free of invasive plants, providing regular weeding is carried out. However, volunteer teams face challenges

with other invasive species too. The Explorer Rose Team, led until recently by Kitty Langill, has its share of common weeds to remove such as ragweed, pigweed, crabgrass and dandelions. However, it is invasive insects that are their biggest problem – namely, Japanese beetles. “They give the word ‘invasive’ a whole new meaning,” she says.

Japanese Beetles in the Roses

Typically, the beetles arrive soon after Canada Day. In Japan, where they originate, the insect is not considered a major pest. However, since its arrival in North America in 1916, it has become one of the most invasive pests in many parts of this continent. It has a voracious appetite for over 350 different plant species, including roses, especially old-fashioned species.

The solution is handpicking and drowning the beetles. Volunteers at the Farm head out in early morning with gardening gloves and a jar of soapy water to do battle with them. Fortunately, the beetles are slow moving, so it is fairly easy to knock them into the soapy water.



Peter Smith, Ontario Crop IPM,
<http://www.omafra.gov.on.ca>

Bindweed

Bindweed in the Elderberry Beds

In the peony beds, team leader Bill Wegman reports no invasive plant problems either, in part, because of regular weeding by his team. However, if time permits, his team extends their weeding to a space just north of the peony beds, an area he calls the ‘elderberry beds’. Here, field bindweed (*Convolvulus arvensis*) is a problem. This is a fast-growing herbaceous perennial vine that wraps and twines its way around existing plants, eventually choking them. The vine spreads through a long, complex, aggressive root system. Field bindweed is deceiving because of its attractive white flowers that closely resemble morning glories. It looks like a pretty vine to those unfamiliar with it. It was likely introduced into North America as a contaminant in crop seed in the early 1700s, a

native of Europe and Asia. In agricultural fields and in restoration efforts in wild spaces across North America, it does great harm.

“I have instructed the team just to cut them off at the base, as I now have a better understanding due to having this problem in my home garden,” Wegman says. “We do try to get them before they get to seed.”

Burdock in the Hosta Garden

In the Arboretum, Hosta Team leader Linda McLaren reports that her team also regularly deals with bindweed and DSV. Another invasive plant that creeps its way through the wooded areas into the hosta beds is burdock (*Arctium*). Its clinging burs easily get caught in the fur of animals, and sweaters, as any dog-walker who walks in the Arboretum will attest. It was also the inspiration for Velcro, a hoop and loop fastener. This tall invasive biennial lives up to four years, producing 6,000-16,000 seeds per plant.

“They’re very hard to dig up as root/crown is so tough, especially as pathways around the garden are clay with gravel on top. We haven’t really been good at getting rid of them,” she says.



Peter Kolanen
<https://www.utm.utoronto.ca/~w3pkota/>

Burdock

Buckthorn in the Arboretum

Eric Jones, leader of the Arboretum’s Shrub Team says that at least three-quarters of his team’s time and energy is spent getting rid of DSV. Bindweed is a problem for that team too. Another invasive that would continue to spread, if left unchecked, is buckthorn – both common and glossy (*Rhamnus cathartica* and *R. frangula*).

This highly invasive shrub or small tree continues to pose challenges not just in the Arboretum but in other parts of Ottawa too, including in the Green Belt where it is becoming the dominant understory species. Its blue-black berries are attractive to birds that spread the seeds through their droppings.

According to Jones, when buckthorn is entrenched in the beds or in woodland areas, it’s difficult to pull out the roots. So, the

Upcoming Events

We're confidently planning for brighter days ahead during 2021, so visit us often at www.friendsofthefarm.ca to see what we're up to. You can also visit our Facebook page for regular updates on what Friends of the Farm events are happening and when.

For more information, email us at Info@friendsofthefarm.ca, or call 613-230-3276.

Arboretum Tours

Arboretum Tree Tours are typically offered every month from May to November and are guided by local experts. Our 2021 series is in development—keep an eye on our website at <https://friendsofthefarm.ca/arboretum-tree-tours/>



Martin MacLeod and the late Louise Demers-Moore, as Mr. and Mrs. William Saunders, Victorian Tea, August 2016.

Horticulture as Therapy

All are welcome to join us on May 19 to hear Sarah Shapiro talk about "Horticulture Therapy: Connecting with Nature."

Sarah practises horticultural therapy at the Perley and Rideau Veterans' Health Centre in Ottawa. She runs both one-on-one and group horticultural therapy programs for veterans and community seniors, including those with dementia and in palliative care. She is a member of the Ottawa Horticultural

Society, Ottawa Herb Society, The Canadian Horticultural Therapy Association, and the Friends of the Farm.

Enjoy an evening of discovery with Sarah and horticulture as therapy. Annual General Meeting (virtual) of the Friends of the Farm, (membership not required). Wednesday, May 19, 2021, 7 pm to 9 pm. Details at www.friends.ca/fcef-annual-events



Master Gardener Lecture Series

Every year the Friends partner with the Master Gardeners of Ottawa Carleton to offer timely and informative presentations. Due to the Covid-19 situation, our lectures have gone online. Pre-registration is required to obtain the link to the Zoom presentation. See our website for more information.

Individual talks: \$8 for Friends of the Farm members, \$10 for others. Series of five talks: \$35 members, \$45 others.

April 20 – **Our Gardens and Climate Change** with

Lesley Peace.

May 4 – **Colour Through the Seasons** with Candace Dressler and Rob Stuart.

May 18 – **Into the Night Garden** with Judith Cox.

September 14 – **Another Gardening Year Behind Us** with Mary Shearman Reid.

September 28 – **A Garden for the Birds** with Julianne Labreche.

Invasive Species at the Farm ... *(continued from Page 3)*

stems are cut near ground. 'Buckthorn baggies' – opaque black plastic bags big enough to cover the stems and base – are placed on top of them and tied to suppress further growth.

Finding Solutions

Speaking more generally, Jones also notes that the original purpose of the Arboretum was to assess the growth and suitability of many species from other parts of the world, as well as North America. Over the years, it's probably fair to say that plant researchers have become much better at

determining which species are highly invasive and which ones do no harm. Meanwhile, scientists continue to work hard to find safe solutions to eliminate, or at least control, the spread of invasive species.

Even as a volunteer, I know that I have a role to play. It's something I contemplate whenever I volunteer at the Farm. Hopefully, as spring beckons and vaccines roll out, our teams will be allowed to return there to work outside, even if it means wearing a mask, hand washing, and social distancing.

Meanwhile, there are big lessons to

learn, including knowledge that plants, like people, face distant, sometimes devastating, threats from beyond our shores. There are small lessons to learn too, like remembering to scrub those garden tools and clean my dirty boots before heading home from the Farm. Heaven knows, I sure don't want those nasty invasive species in my own backyard.

Julianne Labreche volunteers with the Friends of the Farm's perennial team and is a master gardener.

In Memory

Louise Demers-Moore

Louise Demers-Moore, a volunteer with the Friends of the Farm for over 30 years, died on January 24, 2021.

Born and educated in Montreal, Louise moved to Ottawa in 1973 where she worked in language and management training for a variety of federal government departments. When Louise and husband Eric Moore visited the Chrysanthemum Show at the Farm's greenhouses in November 1989, members of the recently-formed Friends of the Farm convinced them to join. Despite a demanding full-time job, Louise signed up for the Green Thumb Team which met on Saturdays. Eric was later to serve as president of the Friends for seven years.

Louise was a founding member of the Friends' Craft Group, which began by turning pine cones into Christmas decorations. These were initially offered for sale at the annual Mum Show. After that event was cancelled, the Group's popular wreaths and tree decorations continued to be a successful fundraiser for the Friends at many sales.

Hardworking, well organized, and committed, Louise put her management and artistic skills to work for the Friends. She helped organize art auctions and craft sales featuring local artisans. She served on the Friends' Board of Directors for a year, responsible for volunteers.

An accomplished knitter and quilter, Louise belonged to local knitting and quilting guilds. In 1998, she organized a successful 10th anniversary fundraising dinner for the Friends, featuring a silent auction to which she donated a delightful quilted wall hanging depicting the Farm and which she had hand crafted.

The 10th anniversary also saw the launch of the still-popular Victorian Tea event. Louise poured tea from a silver service in full period costume, something she continued to do over the years. In recent times, she played the part of Mrs. William Saunders, wife of the first Farm director, hosting the garden party (*see photo on page 4*).



Louise Demers-Moore

Diane McClymont Peace

Diane McClymont Peace, a long-time volunteer with the Master Gardeners and Friends of the Farm, died on December 31, 2020.

Diane graduated from Queen's University with a BSc and from Carleton University with an MSc. She worked in the federal government for 40 years, raised a family and acquired many horticultural and scientific skills. Soon after retiring, she began working at the Green Thumb Garden Centre, and enrolled in the Horticulture Industries Program at Algonquin College.

She volunteered with the Master Gardeners for over 14 years and began to

volunteer as a Friend of the Farm in the spring of 2013. She worked with the roses and at the Merivale Shelterbelt, provided talks and tours of the Arboretum, and wrote articles for this newsletter. She also helped out at the Victorian Tea, the Friends' Plant Sale, and other one-day events.

During her career she travelled extensively and was particularly inspired by her work with First Nations and the Inuit People of the far north. She was an avid seamstress and a lover of canoeing, cross-country skiing, and hiking. She also volunteered with the Girl Guides.



Diane McClymont Peace

Randy Fletcher

Randy Fletcher, who loved the Farm and was a staunch supporter of the Friends, died on January 11, 2021.

Born and raised in Ottawa, he attended Laurentian High School and was a City of Ottawa beach lifeguard, news editor at CKO, and a producer at CKOY. He moved to Newsradio, where he covered Parliament Hill, and this led to work for 12 years with former Minister of Agriculture and Agri-Food Canada (AAFC), the Honourable Lyle Vanclef. Vanclef was

minister when the Farm was declared a National Historic Site in 1998.

When Vanclef retired, Randy joined AAFC, working first at the former Sir John Carling Building, then at Building 59 across from the Ornamental Gardens. He loved working at the Farm, through all seasons. Even when his office moved to headquarters at Baseline and Merivale, he arranged to visit the Farm every day, even if it was just to drive through.



Randy Fletcher

Nancy Fletcher

Our sincere condolences to family and friends of --- Louise, Diane, and Randy.

Controlling Invaders

1. Dog-strangling Vine

In the Fall 2018 issue of this newsletter, Sandy Garland reported on the Dog-strangling vine (DSV) at the Fletcher Wildlife Garden. This vine is the horribly invasive plant that has spread widely around the Farm, strangling other vegetation. It has proven to be very difficult to eradicate. Sandy wrote of her optimism about a predator of DSV that had been recently introduced at the Garden – a moth from the Ukraine named *Hypena opulenta*. Asked recently for an update, she wrote that “we’re still waiting for the moth to have an effect.”

To find out more about this biocontrol project, we contacted Dr. Naomi Cappuccino, of Carleton University, who leads the project in collaboration with colleagues from Agriculture and Agri-Food Canada’s Central Experimental Farm. She forwarded her most recently published research results, which indicated that by 2018, five years after it was released, the moth had established itself at the Farm. She then responded to questions:

It’s very good news that the biocontrol agent for the DSV was well-established in 2018 at the test site at the Farm. What has happened in the last couple of years?

Hypena has indeed made it over to the Garden (the test site), but in very low numbers. And I did not see more damage at the Farm last summer. Because of the pandemic, I wasn’t able to actually work at the Farm and get any data, but I could walk through and make casual observations.

How long do you expect it to take to see major success in the heavily infected areas of the FWG and the Arboretum?

I am impatient, too. Biocontrol is a great tool for pest management, but there is no way to predict whether a biocontrol agent will do the job and how long it will take to achieve control. I am hoping that *Hypena* turns out to be another *Galerucella* —the beetle introduced against purple loosestrife—which took 20 years before it really got going. Now it is doing a great job keeping loosestrife from dominating wetlands.

Why might biocontrol not be successful?

We know almost nothing about why some agents succeed while others fail, mainly because we have very few follow-up studies after the releases (the funding dries up). One hypothesis is that unsuccessful biocontrol agents are too well controlled by

native natural enemies to reach the population levels necessary to control their target weeds. Once agents are released, they can be eaten by birds, rodents, spiders, and predacious insects.

We did a little chemistry, looking for toxins in the larvae of the *Hypena* that could defend it from such enemies, and found none. So, we predicted that *Hypena* larvae would be a tasty treat for birds, keeping them from ever becoming abundant enough to be a good control agent.

Boy were we ever wrong— birds won’t touch them! During the summer of 2019 we offered *Hypena* larvae and caterpillars to birds in feeders, with mealworms as controls. Cardinals, chickadees, and song sparrows looked at *Hypena* but did not even taste them. This is good news for the prospects of *Hypena* eventually becoming a successful biocontrol agent.

As well, so far, we have found no threat to the eggs or larvae by native parasitic flies or wasps. *Hypena* pupae are vulnerable to small mammals, crickets, and ground beetles, although we have some evidence that crickets and ground beetles avoid the pupae after eating them once. So

far, the only predators that seem to be able to eat *Hypena* with impunity are stink bugs.

So why isn’t the *Hypena* population growing faster?

I wish I had the answer. One guess I have is that *Hypena* is a strong flier, and the females seem to want to space their eggs out rather than lay them in clusters, which would lead to locally dense and very visible infestations. For all we know, the population could be increasing dramatically,



Naomi Cappuccino

Dog-strangling Vine.



Naomi Cappuccino

Hypena

Controlling Invaders ... (continued from Page 6)

only it is so spread out in space that we don't see it yet—the larvae and their damage are "diluted" by the "sea" of DSV.

What are the chances of collateral damage?

The question of collateral damage by biocontrol agents is an important one, since mistakes were made in the past. Cane toads come to mind, as well as biocontrol weevils on thistles that attack endangered native thistles. *Hypena* went through years of testing on more than 80 native species, including many in the milkweed family *Apocynaceae* (of which DSV is a member), to make sure it could not feed on any natives. Larvae nibbled on a couple—one milkweed relative and two nettles—but died shortly thereafter.

DSV comes from a tribe of the *Apocynaceae* that is entirely Old World in distribution. Not having any close relatives in North America makes it an ideal target plant for biocontrol.

2. Lily Leaf Beetle

The Lily Leaf Beetle arrived in Ottawa in 1981 and began to devastate lilies in local gardens and native lilies in the wild. Famed hybridizer Isabella Preston had begun a lily bed in 1942 in the Ornamental Gardens that contained, among others, her Stenographer and Warplane hybrids. The high maintenance required to fight the beetle led eventually to the removal of the lily bed and discouraged local gardeners from planting lilies.

In what has become a success story in biocontrol, the Lily Leaf Beetle has met its match in the shape of an imported wasp. Dr. Cappuccino tells the story:

"In 2010, we released a tiny, non-stinging wasp, *Tetrastichus setifer*, which only attacks Lily Leaf Beetles. Both the beetle and the wasp are native to Europe. Before being introduced to North America, the wasp underwent thorough testing to be sure that it would not attack any native beetles.

"The wasp lays its eggs inside the body of the beetle's larva. Upon hatching, the wasp larvae devour the beetle from the inside out. Wasp numbers quickly increased at the Farm. The parasitism rate at our release site on the Farm (which is only about 200m from the Ornamental Gardens) has been so high that we have a hard time finding the beetles now. I'm sure that lilies can once again be planted in the Ornamental Gardens.

"Releases in the U.S. have been similarly successful. Last summer, I planned to do a survey of all the release sites in Ottawa and across Canada, but the pandemic threw a wrench in those plans."

Dr. Naomi Cappuccino is Associate Professor, Department of Biology, Carleton University, whose research focuses on the biological control of invasive insects and weeds. Her Lily Leaf Beetle tracker website is at <https://lilybeetletracker.weebly.com/>



Lily Leaf Beetle larvae.

Naomi Cappuccino



Tetrastichus setifer wasp at work on Lily Leaf Beetle larva.

Andrea Brauner, AAFC

Consider joining the Friends of the Farm!

Find our membership form on the website and pay by PayPal or send in a cheque:

www.friendsofthefarm.ca/become-a-member/

Benefits include discounts on Master Gardener lectures hosted by the Friends, one free adult admission per visit to the Canada Agriculture and Food Museum, quarterly printed newsletters by post, and monthly Farm Notes e-newsletters.

We also accept donations to support our activities and events, which also support the garden teams that maintain the cherished Ornamental Gardens. A variety of donations can be made through our webpage:

www.friendsofthefarm.ca/donations/



Insect Intruders in the Arboretum

By Eric Jones

The emerald ash borer (EAB), which originated in China, has killed hundreds of millions of ash trees since it appeared in North America a couple of decades ago. Like other cities, Ottawa has been hit hard by the EAB and the Arboretum has lost much of its ash collection. While some ash trees have been protected by injecting chemicals into the tree, the results have been mixed, the program is costly, and so Agriculture and Agri-Food Canada (AAFC) is no longer injecting ash trees with chemicals.

A more promising strategy is biological control, an approach that started several years ago in Canada, using parasitoid wasps from Asia to control the EAB. This is a very long-term strategy and we won't know for years how well it's working. The project slowed down in 2020 because the pandemic made it difficult to source the wasps.

A third strategy involves a fungus and a trap. The EAB beetles fly into the trap and become infected with the fungus and then fly away. They die in about five days, after having spread the fungus to other

beetles. This approach, called FraxiProtec, is being studied by researchers in Canada.

Canada is also storing seed from ash trees at the National Tree Seed Centre in New Brunswick to retain the genetic pool for the species. There is further research underway in the U.S. on genetic resistance to the EAB.

Most of the native ash trees in the Arboretum are gone. Nearly all of the remaining ash trees are either Asian or European.

Other insect threats

The EAB is not the only invasive insect causing problems in the Arboretum. There is evidence on some beech trees of invasive beech bark disease. This condition is caused by a combination of an introduced beech scale insect from Europe, coupled with a fungus. The scales open wounds in the bark, providing an entry for the fungus. This disease is not moving as fast as the EAB, but it is a serious threat to beech trees here.

The European gypsy moth has been established in Ontario for decades.

Outbreaks occur every 7 to 10 years, and in 2020 there was significant defoliation in parts of the province. As a result, there are many egg masses on branches of trees in the Arboretum and, although most trees will survive the onslaught, there may be significant defoliation occurring this year.

There are other insect threats on the radar as well. The hemlock woolly adelgid has been devastating to these trees in the eastern U.S. and is moving closer to Ontario. An invasive of particular concern is the spotted lanternfly which is voracious and will threaten many tree species if it gets entrenched here.

The multiple challenges our trees are facing, of which insects form only part, are somewhat akin to what we humans have been beset with lately. Here's hoping for a swift vaccine roll out, and new solutions to mitigate tree pests and diseases.

Eric Jones worked for the Canadian Wood Council and leads the Arboretum volunteer team.

Klaus Bolte, Canadian Forest Service, Natural Resources Canada



Emerald Ash Borer.

R. Hinchliff



AAFC staff member injecting ash tree 10 years ago.



FraxiProtec trap for Emerald Ash Borer, by GDG Environment.

Ontario's Invasive Species Awareness Program, www.invasivespecies.com



Beech Bark Disease.



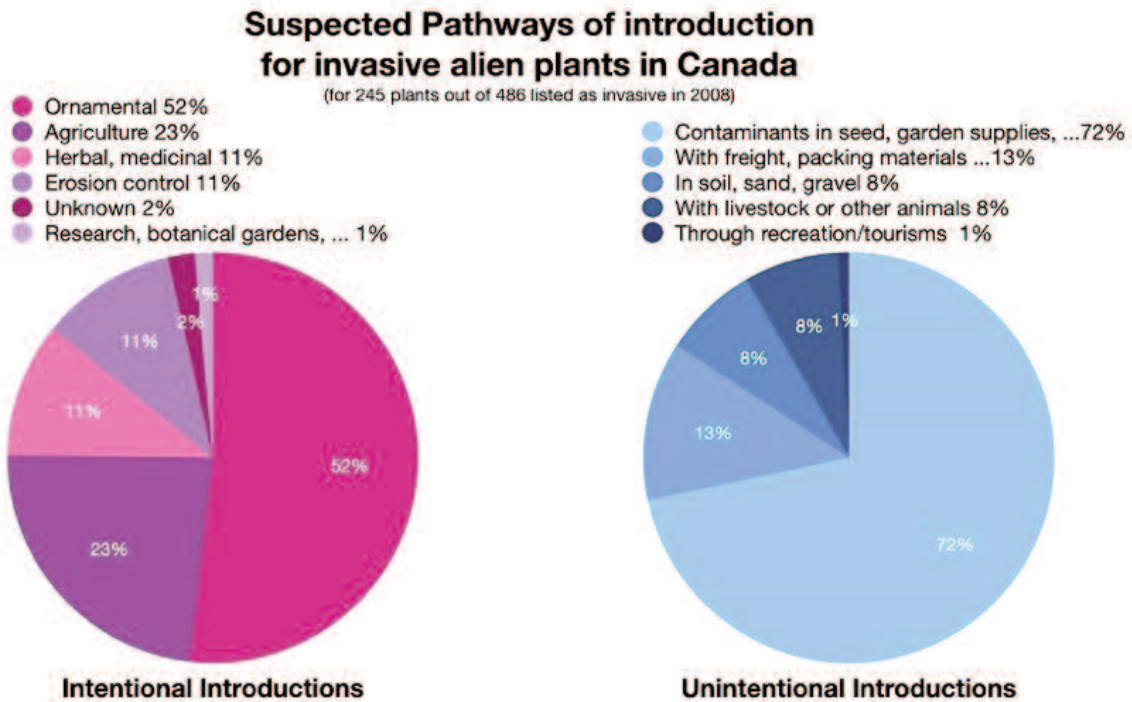
Hemlock Woolly Adelgid's eggs resemble small tufts of cotton, typically found at the base of needles.

Ontario's Invasive Species Awareness Program, www.invasivespecies.com

www.gdg.c

Invasive Plants – Where do they come from?

By Dale Odorizzi



Canadian Food Inspection Agency, 2008. *Invasive Alien Plants in Canada: Technical Report*. CFIA, Ottawa, ON http://publications.gc.ca/collections/collection_2008/inspection/A104-74-2008E.pdf

Invasive alien species have been identified as the second greatest threat to biodiversity, after habitat loss. Invasive species take hold slowly. Their impact is often not recognized until it is too late. The damage can be irrevocable, and the cost of management enormous.

How do these invasive species come to Canada? The above chart from the Canadian Food Inspection Agency (CFIA) shows suspected pathways of introduction.

More than 80% of the invasive alien plants originated primarily in Europe, western Russia, and the Mediterranean and about 15% came from China and Japan.

We gardeners must take a large share of the blame for their introduction with our desire for beautiful ornamental plants, agriculture, and herbal medicines. We are also responsible for much of their spread through our movement of soil, garden equipment, garden supplies and recreation and tourism.

Some plants were brought here when our ancestors immigrated to Canada. For

example, garlic mustard (*Alliaria petiolata*), one of our most aggressive invasive plants, is an herb that is native to Europe. Rich in vitamins A and C, it first arrived in Canada in the 19th century and was cultivated for eating. It spends its first year putting down substantial root system and then grows in dense stands that double in size every four years. Within 5-7 years of introduction, it can become the most dominant plant in the forest. White-tailed deer graze down native shrubs but turn up their noses at garlic mustard.

What do these alien invasive species have in common?

Invasive plants invade our forests, prevent native plants from growing, and have a negative impact on how ecosystems function. Most invasive species:

- grow in a wide variety of soil and light conditions;
- alter growth form to suit current conditions;
- grow more quickly than their native

counterparts;

- form dense clumps, preventing other plants from growing;
- sprout earlier in the season than natives, shading out the native plants;
- lack any natural predators and pests, and
- produce a large quantity of seeds and berries that are spread far afield by wind or wildlife.

This is an excerpt, reprinted with permission, from Dale's article in Trowel Talk, the newsletter of the Ottawa Carleton and Lanark Master Gardeners, Vol 12, No.1, January 15, 2021. She goes on to present examples of these alien species and to suggest what we can do about them. In February, Trowel Talk began a series of articles on non-native invasives that are popular garden plants in the Ottawa area, beginning with Bugleweed. You can find the newsletter at http://www.mgottawa.ca/Trowel_Talk.php.

Turning the Page

By Blaine Marchand

Housebound. Shut in. We grow impatient as the days
lengthen by degree though still are cold as metal
and the snow is a hard dome over the ground.

We search out books, impulsively turn page after page
that capture the tendering of a woodland overspread
in trillium grandiflorum, yellow trout lilies, purple anemones;

flip through catalogues offering tools with handles
to fortify our grip, three-pronged claws to prod gently,
anxious for spring earth to shine its green light;

next, seed listings encourage with an array of the bounty
soon to be ours – Scarlet Runner beans, Bull's Blood beets,
Aunt Ruby's German Green tomatoes – the kitchen ripe in aroma;

we draw deep breath – so many months and when will this all end –
as annuals match our shift in mood – Tidal Wave petunia,
Only the Lonely nicotiana – but just momentarily, certain our gardens
will soon give us leave and we with them will finally be restored.

Blaine's award-winning poetry and prose has appeared in magazines across Canada, the U.S., Pakistan, India, and New Zealand. With six books of poetry, a young adult novel and a work of non-fiction published, his latest poetry collection, Becoming History, will appear in autumn 2021. Active in the Ottawa literary scene for over 50 years, he has also served as President of the League of Canadian Poets.

Crabapple Stamps

Crabapple blossoms adorn the latest Canada Post flower stamps, released on March 1, and the varieties featured—'Rosseau' and 'Maybride'—were both bred at the Central Experimental Farm.

Pink 'Rosseau' was one of the Rosybloom crabapples of Isabella Preston that she named in 1928 after Canadian lakes. Preston's successor Daniel Cameron bred and selected a number of crabapple seedlings for testing across Canada. In 1968, after Cameron had left the horticulture division, his former colleague Dexter Sampson named one of the best of Cameron's seedlings 'Maybride'.

It will soon be crabapple bloom time at the Farm. Around the third week in May, we see the glorious blossoms of 'Rosseau' and other Rosyblooms alongside Prince of Wales Drive. At the same time, several stunning 'Maybride' crabapples in bloom can be seen in front of the southern entrance to the K.W. Neatby Building, the Farm's research centre.



Research at the Farm Results in New Biological Controls

By Joan Butcher

In the fields and labs that comprise Agriculture and Agri-Food Canada's (AAFC) Central Experimental Farm site, important research is underway to provide new biological controls for the safe and effective control of invasive alien species.

Dr. Peter Mason leads a team of researchers that is painstakingly evaluating the safety of biological control agents so they can be approved for use against invasive pests in Canada's agriculture crops. The researchers focus on finding parasitoids, organisms that live on or in a host organism, that are cost effective, extremely specific, and will ultimately reduce the invasive species to very low numbers. Currently, they are working on finding control agents for the following:

- the leek moth (affecting allium crops);
- the diamondback moth (brassicaceous crops);
- the cabbage seedpod weevil (canola); and,
- the brown marmorated stink bug (vegetable and orchard crops).

There are many steps in the evaluation process, and it continues even after an agent is released. The researchers must establish if, for example, the parasitoid has survived the Canadian winter, is affecting non-target species, and has effectively attacked the invasive species.

In It for the Long Haul

Identifying a natural enemy of a pest presents a true investigative challenge. An invasive species, having come from elsewhere, has no natural enemies in Canada. Therefore, its area of origin has to be traced precisely in order to find the agent that specifically works to control it. Taxonomists use molecular data, in part, to carry out this detective work. AAFC works with the Centre for Agriculture and Bioscience International (CABI) in the United Kingdom, Switzerland and China to identify and vet possible control agents. It can take up to 15 years to find a good candidate.

Once an organism has been selected, it is imported into a containment facility on the Farm where it cannot escape into Canada's environment, to perhaps become an invasive species itself. After researchers have learned how to rear the organism, it is tested and re-tested to ensure it has no unintended result on non-target species. Field studies are also carried out in the native range of the natural enemy, taking up to 15 or more years.

Eventually, if the data collected indicate a strong case for allowing the importation of the organism, this is then presented as a petition to the Canadian Food Inspection Agency, the regulatory body that is dedicated to safeguarding Canada's food, animals, and plants. The petition is then assessed through an arm's-length review mechanism and a final decision to release or not to release is made by the CFIA.

Even after the CFIA has issued a letter to allow importation, the release of the organism is still considered experimental. The post-release monitoring stage can take another ten or more years.

In the Public Good

Establishing and distributing biological controls for invasive species on crops involves advanced research, international cooperation, and the ability to access a network of provincial agricultural experts to enable distribution. The rearing, field testing, data generating, data analysis, and follow-up monitoring associated with introducing biological controls that will establish in nature is a task which Government of Canada



Peter Mason

A.M. Brauner, AAFC

scientists are uniquely able to take on. No commercial entity would be likely to spend some 25 years researching an organism, to offer it to what could be a limited market.

Progress Being Made

Leek moth

- A parasitoid was released in 2011 and post-release monitoring is underway to determine establishment, spread, and impact on the leek moth.

Brown marmorated stink bug

- A potential parasitoid that was introduced with the pest has been found, and work is continuing to study its impact on the target and native stink bugs.

Diamond back moth

- A candidate parasitoid is being evaluated to determine if it would be specific to this pest. Data is being analyzed to determine if a case for release into nature is justified.

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A.M. Brauner, AAFC

Parasitoid released in 2011 to combat the leek moth.



T. Haye, CABI

Parasitoid that was accidentally introduced with the cabbage seedpod weevil.

Cabbage seedpod weevil

- After 15 years of research to evaluate a parasitoid, it was determined that this species was not host-specific enough to justify release into nature. However, it was discovered to be already present in Canada. The research conducted has proved valuable to track the spread and impact of this natural enemy on the pest and on native weevil species that feed on seeds in siliques,

like the cabbage seedpod weevil does.

Dr. Mason was the recipient of the 2019 Entomological Society of Canada's Gold Medal which recognized his influential role in developing new tools to improve the risk assessment of biological control agents, increasing the dynamics of pest-natural enemy systems; and identifying new threats posed by non-native species. Enthusiastic about the future expansion of biological control methods,

he is justifiably proud of the work that AAFC researchers have done to enhance their discovery, development, and implementation.

Joan Butcher, a Friends of the Farm volunteer, previously worked for the federal government as a communications director. She continues to volunteer with the Friends as best she can from her new home in Dartmouth, Nova Scotia.

Virtual Farm Tour

Felicity Garrard's delightful online presentation about "this marvellous green oasis in the middle of our busy sprawling city" is now available in French. "Hommage à la Ferme expérimentale d'Ottawa" can be watched at <https://youtu.be/1FBoLnKybo4>

You can still see her English version "In Praise of Ottawa's Experimental Farm," at https://www.youtube.com/watch?v=-csDQ_hEkPs



Felicity Garrard



The Friends of the Central Experimental Farm is a volunteer organization committed to the maintenance and protection of the Ornamental Gardens and the Arboretum of the Central Experimental Farm in Ottawa, Ontario, Canada.

The Friends of the Central Experimental Farm publish the Newsletter (ISSN 1702 2762) four times a year (Winter, Spring, Summer, Fall). All members receive the newsletter and it is sent by regular mail or e-mail.

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