

Grow Me Instead: Horticultural Alternatives to Invasive Plants

Includes:
Final Report

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Community Research Project
for the Ontario Invasive Plant Council

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This research project included three research components that linked to the voluntary program offered by the OIPC called the Grow Me Instead Nursery Recognition Program. The first component was a literature review to identify new invasive plants and non-invasive alternative plants that the OIPC could include in an updated version of the Grow Me Instead Guide provided to nurseries and the public. The second component included program outreach, where nurseries were contacted to see if they would be interested in participating in the Grow Me Instead Nursery Recognition Program for 2015. The outreach also included a poster presentation at the Community Innovation Forum for in-person outreach in addition to the telephone calls conducted in the Otonabee and Lower Trenton regions. The final component of the project was a feedback research project, where telephone interviews were completed with past participants of the Grow Me Instead Nursery Recognition Program. A survey collecting participant feedback as well as general invasive plant/non-invasive alternative plant sales was conducted with nurseries to evaluate the effectiveness and engagement of this program with industry partners as well as the public.

Glossary of Terms

Alternative Plant: a species that is meant to be used instead of an invasive plant for use in horticulture and gardening. Alternative plants are either native to the area, or are an introduced species that do not exhibit invasive tendencies.

Horticulture: the branch of agriculture that deals with the art, science, technology, and business of plant cultivation. Horticultural businesses include nurseries, greenhouses, garden centres and landscaping companies that supply plant species to the public either through wholesale, retail, or online distribution.

Introduced Species: species that are not native to the area of which they are sold or distributed, and are introduced to an area either intentionally or not intentionally through human activities. While many invasive plants are introduced species, not all introduced species develop invasive characteristics.

Invasive Exotic Plant Species Rankings for Southern Ontario: a listing of the invasive exotic species found in natural habitats in southern Ontario developed by Urban Forest Associates Inc. and used for the identification of invasive plants for the literature review.

Invasive Species: an organism whose presence results in negative effects on the environment or the economy. Invasive species can out-compete native species, prey on them directly or result in a loss of ecosystem functions or services due to the disruption of natural trophic interactions or cycles in an ecosystem. Because they are most often not in their natural ranges, invasive species can have no natural predators in the new area which allows for their populations to grow rapidly and crowd out the native flora and fauna of an area.

Native Species: an organism that is naturally found in an area, and whose normal range and distribution is present at a location. Native species are part of the local ecological communities and play a role in the ecosystem functions, processes and trophic interactions of that region.

OIPC: The Ontario Invasive Plant Council

USDA Hardiness Zones: a letter-numeric classification for geographic regions in reference to a specific category of temperature conditions. Plants are categorized under the zones based on the plant's ability to grow in that zone, based on the climatic conditions, including its ability to withstand the minimum temperatures of the zone. One of the most common hardiness zone guides is the guide produced by the United States Department of Agriculture (USDA).

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Part One: Literature Review

The Threat of Invasive Species and Horticulture

As discussed by Buchart (2008): “After habitat loss and degradation, the leading threats to biodiversity are over-exploitation and invasive alien species” (S245). Invasive plants management is a current issue that is gaining increased awareness by members of the public as well as industry and commercial representatives, due to their role in the introduction of alien species. As key contributors to the distribution of these plants, the cooperation of the horticulture industry in controlling the import of exotic, invasive plants is a pivotal move to target invasive plants at their source. With so many exotic species being brought into Ontario by these industries, the need for knowledge and understanding of potentially invasive plants has become an area of needed research, particularly due to the ability of these invasives to cause the impairment of ecosystem functions and the loss of biodiversity in biological communities (Bennet et. al., 2013).

Climate change has been a major driver linked to the ability for invasive plant species to increase their geographical ranges, and has been found to allow these species to colonize where they have never been able to historically due to changes in temperature gradients (Williams and Grosholz, 2008). These two environmental issues are also integrally linked, as climatic changes may allow for the survival of invasive plant species in expanded ranges, and invasive plants have been found to diminish the ability for an ecosystem to be resilient to shifts in climatic conditions (Pyke et. al. 2008) Invasive species have also been able to increase their geographic ranges due to intentional introduction into a new area due to industrial and commercial sale of these species. The horticulture industry is a prime example of this, and is a key pathway for alien plant species to be introduced because of the demand of exotic, ornamental plants from other regions. As discussed by Reichard and White (2001), plants used in horticulture can pose a significant risk to natural ecosystems when those alien species break out of cultivation or escape from the contained landscapes, with a study in the U.S. finding that 82% of woody

plants that were invasives were found to have originated from landscaping and horticulture businesses.

With the increased connection of trade routes between different countries and the demand for unique ornamental plant species, the rate of invasive species has increased exponentially with the facilitation of opportunities for an alien species to move from one region to another (Mooney and Cleland, 2001). When an alien species establishes outside of its normal range, the risk emerges that the species will no longer have natural predators or other ecological stressors present that would have originally managed their population growth and abundance (Mooney and Cleland, 2001).

It should be noted, however, that the demand for ornamental plants has not been the only driver for the introduction of potentially invasive plants into an area. Herbs such as mint family that have culinary or medicinal properties are also marketed by the horticultural industry, and in some cases are grown for these prized characteristics with full understanding of the invasive tendency of the plant (Reichard and White, 2001).

Many invasive plants introduced in horticulture are able to grow quickly and tolerate full sun; a key selling feature for gardens and landscapes. This can result in problems for ecosystem types such as grasslands, savannahs and meadows, which have long sunlight exposure periods. When these invasive plants have shade-tolerances, such as the plant Oriental Bittersweet (*Celastrus orbiculatus*), they can pose a significant risk to forested ecosystems, where they can outcompete native ground covers and homogenize the understory (Derickx and Antune, 2013; DNR, 2012).

The following report provides an overview of some invasive plants as well as non-invasive/native alternative plant species in Ontario. The invasive species were identified as those that would benefit from more research as identified in the Invasive Exotic Plant Species Rankings for Southern Ontario, and the alternative native and non-invasive plants were those species that had not been identified in the original Grow Me Instead Nursery Recognition Program Guide.

Emerging Invasive Plants in Horticulture

Royal Empress Tree (*Paulownia tomentosa*)

Introduction/Plant History

The Royal Empress Tree, also known as the Princess Tree, is indigenous to China and other parts of Asia. It was first introduced to Europe in the 1830's, and was first cultivated in North America in 1840 as an ornamental plant for landscaping (Remaley, 2009). This is a deciduous tree species, and is characterized by bright green foliage, as well as large clusters of flowers that range in colour from white to purple and with prominent fruit development. In China, this tree species is also used for medicinal purposes, and as a harvestable wood that is often carved into various products (Corredoira et. al., 2008).

Range of Invasive

The Royal Empress Tree is currently present in its indigenous habitat in China as well as cultivated in Japan, throughout Europe and on the east and west coasts of the United States (see Figure 1). As discussed by Corredoira et. al. (2008), climate change is expected to allow this species to continue to establish in natural ecosystems northward into Canada, due to its ability to survive in a wide range of hardiness zones from 5b to 9b USDA (Dave's Garden, 2014).

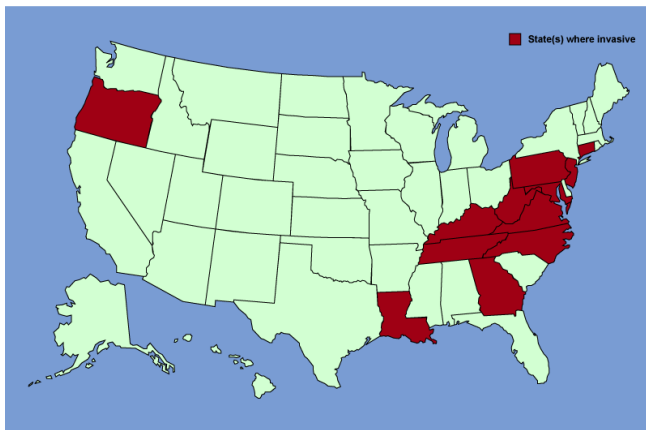


Figure 1. Range of *Paulownia tomentosa* in the United States where it is considered invasive, Remaley, 2009.

Use in horticulture

It is a popular ornamental tree for its attractive deciduous foliage and flowers, but also is considered a valuable species due to its fast-growing capabilities. This attribute of the tree expands its use not only in horticulture for landscaping, but also in phytoremediation where degraded sites are planted with seedlings and where the ability for trees to establish quickly is an asset (Corredoira et. al., 2008). This tree is also grown for its medicinal values in the fruit and bark of the tree, with plant parts commonly used in Chinese medicine to treat ulcers, warts and other skin ailments (Bellarmine University, 2004).



Figure 2. Royal Empress Tree, Webster, 2014.

Ecological Impacts/ Implications

This tree species is an early successional species, and so it thrives in areas of disturbance. This attribute can be a problem for native species facing disturbance from herbivory, weather events or anthropogenic activity, and so the Royal Empress Tree is able to establish much faster and outcompete most native species in these conditions (Corredoira et. al., 2008). This tree develops a very thick and extensive root system (accommodating the fast growth), but this also makes it difficult for other plant species to grow alongside it. The Royal Empress Tree is at the most risk of escaping cultivation and taking over edge habitats such as forest edges, along riparian zones and on steep banks. As discussed by

Ehrenfeld (2008), this tree species poses a risk for natural areas surrounding urban environments. Urban environments represent a major source of anthropogenic disturbance as well as a source for potentially invasive plants that are used in landscaping. This source of disturbance and stock can detriment surrounding habitats such as urban wetlands or edge habitats, which have been found to be impacted by encroaching Royal Empress Trees that change the biological structure of wetlands and the loss of biodiversity.

Spotted Knapweed (*Centaurea maculosa* Lam.)

Introduction/Plant History

Spotted knapweed is a perennial plant species that is native to southeastern Europe and Asia and is associated with grassland habitats. This plant first arrived in North America in 1900, and has caused significant issues in the United States and Canada where it is known as an agricultural weed (Sheley & Borkowski, 2001). Spotted Knapweed can be identified by its characteristic bunching of plants, as well as the small tufts of purple flowers, as seen in *Figure 3*. This plant can grow to 1m high, and will grow into clumps of vegetation throughout grassy areas.



Figure 3. *Centaurea maculosa*. Wikipedia, 2015.

Range of Invasive

Spotted Knapweed is found across the United States and Canada, as seen in *Figure 4*. There are many different types of *Centaurea* that are native to Canada and Ontario, but *Centaurea maculosa* (also known as *Centaurea stoebe*) is non-native species that came to North America through the agricultural trade where it was mixed in with

alfalfa plants. According to Jacobs and Sheley (1999), Spotted Knapweed “has been spreading at an average rate of 27% per year over the last 80 years” (626), and is found in 15 states and 8 provinces including Ontario.

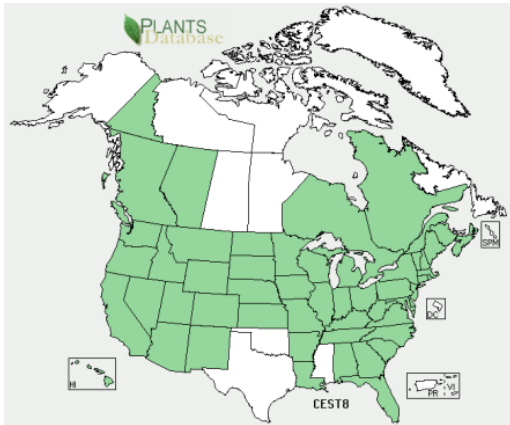


Figure 4. Spotted Knapweed Range Map. Invasiveness, 2015

Use In Horticulture

Research on Spotted Knapweed has shown that there is little use of this plant species in horticulture. However, there are multiple species of Knapweed that occupy Ontario, and so potential confusion with which species are native may be a concern. Because of this plant’s ability to easily invade grassy or disturbed areas, cultivated gardens may become targets of this invasive species, and so proper identification by both nurseries and the public would be beneficial to stop the spread of this plant (Sheley & Borkowski, 2001).

Ecological Impacts/ Implications

Spotted Knapweed is a highly invasive plant particularly in grassland ecosystems. In only 1999, Spotted Knapweed had been found in 2.5 million hectares within the United States and Canada (Jacobs and Sheley, 1999). This plant is associated with losses in biodiversity, as well as a loss in wildlife habitat due to its ability to form dense bunches of vegetation unsuitable for animal browsing. Spotted Knapweed also contains a chemical known as Sesquiterpene lactones, which is particularly toxic to cattle and wildlife that ingest it and inhibits the growth of other plants around it (Pierce County, 2015). Spotted Knapweed has been linked to significant impacts to not only agricultural

operations, but also ecological impacts with the invasion of grassland habitats, forest edges and disturbed areas, and has been linked with significant soil erosion when other grass species are lost (Sheley, 1999).

Urban Avens (*Geum urbanum*)

INTRODUCTION/PLANT HISTORY

Urban Avens, also known as Wood Avens, European Avens, St. Benedict's Herb, Town Avens and Herb Bennet, is an invasive perennial herb from the Rose family. This flowering plant is native to Europe, and has a native range from the British Isles to Norway to Spain and as far east as Iran (Taylor, 1997). This plant has wide climatic tolerances, and so is easily able to establish in new regions. European Avens has a long history of medicinal use in European Traditional Medicine, and is thought to aid multiple ailments including rheumatism, gout, infections and fever (Vogl et. al., 2013).



Figure 5. *Geum urbanum*. Ontario Wildflowers, 2015.

Range of Invasive

Urban Avens is widely distributed across eastern North America. As seen in *Figure 6*, this plant can be found as far south as Florida, and has a northern range of northern Manitoba, Ontario and Quebec (Ontario Wildflowers, 2015). This plant prefers to grow in disturbed areas, and so can be found in disturbed forests, edge habitats as well as open urban landscapes such as lawns and cultivated gardens (National Park Service, 2015).

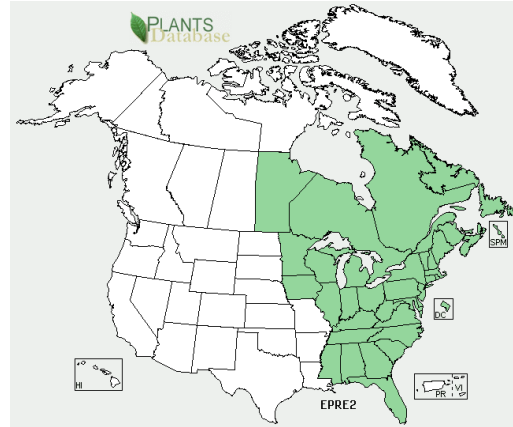


Figure 6. Range Map of *Geum urbanum*. Ontario Wildflowers, 2015.

USE IN HORTICULTURE

Research showed little to no intentional cultivation of *Geum urbanum* in Ontario. This species, however, is able to easily spread in urban environments, and the Latin name *urbanum* even implies that this species is “moved with man” across the landscape (National Park Service, 2015). Confusion might arise between this invasive species and similar native species of *Geum* such as Yellow Avens (*Geum aleppicum*) and Water Avens (*Geum rivale*).

ECOLOGICAL IMPACTS/IMPLICATIONS

Urban Avens is a highly invasive herb that is associated with urban landscapes and disturbed areas. There are native types of *Geum* such as the Yellow Avens (*Geum aleppicum*) that this plant hybridizes, and so there is some difficulty when identifying this species in the wild. As discussed by the Central Lake Ontario Conservation Authority, *Geum urbanum* is considered a Category One invasive plant, which classifies it as an “aggressive invasive exotic species that can alter and dominate sites and exclude native species. These organisms are a threat to natural areas, as they disperse widely, through transport by animals and natural means (water, wind, etc). These species are top priority [for management] however control may be difficult.” (2010, p.16).

Oriental Bittersweet (*Celastrus orbiculatus*)

Introduction/Plant History

Oriental Bittersweet, also known as Asian Bittersweet and Round-leaved Bittersweet, is a woody vine that originated from Eastern Asia. This plant was first transported to the United States from China around 1860 as an ornamental plant in the horticultural industry (DCNR, 2015). Oriental Bittersweet can be identified as a woody vine with round, deciduous leaves that can grow up to 60 feet in length, as seen in *Figure 5*. This plant is extremely shade tolerant, but when allowed full sun is able to grow to significant lengths (DNR, 2012). During the fall and winter, this plant produces red berries (as seen in *Figure 6*) that are food for some bird species, allowing it to spread quickly throughout forested and edge habitats (Leicht-Young & Pavlovic, 2012).



Figure 5. Oriental Bittersweet. Invasive.org, 2015.



Figure 6. Oriental Bittersweet Berries. Invasive.org, 2015.

Range of Invasive

Oriental Bittersweet is found across eastern North America, as far south as Louisiana and as far north as northern Ontario and Quebec (as seen in *Figure 7*). According to Merow et. al. (2011), bird species such as the European Starling (*Sturnus vulgaris*) have facilitated the spread of this plant's seed across North America, due to the ingestion and dispersal of seeds in the red berries found on this plant in the fall.



Figure 7. Range of Oriental Bittersweet. USDA, (2012).

Use In Horticulture

Oriental Bittersweet is actively sold in horticulture. Oriental Bittersweet is often used as decorative ornament during the wintertime, where cuttings are made when the red berries are fruiting (DNR, 2012). In a study by North Carolina State University, this plant only has an estimated annual wholesale value of \$5,900 (2009) for the horticulture industry, but it is considered a particularly important plant for craft markets that use the stems and berries for decorations. According to the U.S. Forestry Service, this plant was historically (and still currently) used to produce wreaths and flower arrangements during the fall and winter, which has facilitated its spread across North America (USDA, 2015).

Ecological Impacts/Implications

Oriental Bittersweet is able to create dense stands that crowd out other types of vegetation. This plant has significant impacts to forest ecosystems in particular, due to its

ability to grow around and over other vegetation. Oriental Bittersweet has been associated with decreased sunlight being able to reach forest vegetation, breakage of tree limbs due to excessive weight, as well as plant girdling and resulting losses in biodiversity (NCSU, 2015). Because of the weakening of tree limbs, Oriental Bittersweet is able to make forest stands more susceptible to damage from ice and windstorms. Another concern with this species is the hybridization that is occurring with native species of Bittersweet, which may over time cause that native species to be lost (DNR, 2012).

Lesser Celandine (*Ficaria verna*)

Introduction/Plant History

Lesser Celandine, also known as Fig Buttercup, Figroot Buttercup, Figwort, Pilewort, Buttercup Ficaria, Bulbous Buttercup, and Small Crowfoot, is an invasive ground-cover herb that is a spring ephemeral plant (USDA, 2006). This plant is related to the common buttercup, and was introduced to North America from Europe as an ornamental plant. The first evidence of this species in North America found to be in 1867 from a Pennsylvania herbarium (Axtell et. al., 2010). As seen in *Figure 8*, this plant can be identified with its dense, short and dark foliage as well as its small yellow flowers with eight distinct petals. It is similar in appearance to the Ontario native plant marsh marigold (*Caltha palustris* L.).



Figure 8. Lesser Celandine. USDA, 2006.

Range of Invasive

Lesser Celandine is found in 21 states across the United States, as well as four provinces including Ontario (Axtell et. al., 2010). There are five subspecies of Lesser Celandine, and as of 2010 all five have now been reported in the United States. This species spreads through the distribution of its tubers, and has a high colonization capacity due to its short generation time (Axtell et. al., 2010).

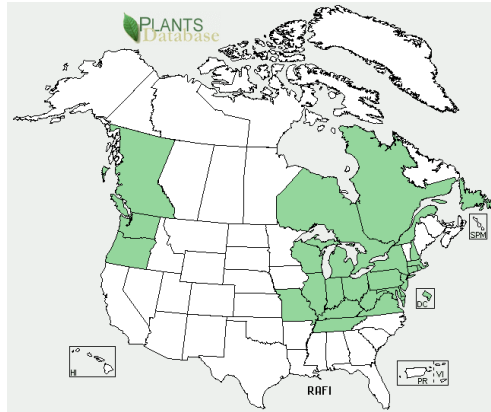


Figure 9. Range map for Lesser Celandine. USDA, 2006.

Use in Horticulture

This plant was introduced to North America through the horticulture industry as an ornamental plant for gardens. This species, as well as numerous cultivars and hybrids are currently available in the United States and Canada for purchase at nurseries and garden centres. These plants are often marketed as ground covers and border plants for gardens. Lesser Celandine has also been historically used for medicinal purposes as a treatment for scurvy, hemorrhoids and infections due to its antibacterial properties. The tuber of this plant is also edible, and so was historically planted as a food crop as well as an ornamental plant (Axtell et. al., 2010).

Ecological Impacts/Implications

Lesser Celandine is able to create dense mats of vegetation that cover forest floors, and will even grow over top of other invasive plants such as English Ivy (Seville,

2015). This plant can thrive in various different habitats, but is of most concern in forest ecosystems and urban riparian areas. As this plant propagates from pieces of its tubers, aquatic features are key facilitators of the spread of Lesser Celandine along riparian areas (Masters and Emery, 2015).

By creating monocultures, native species are crowded out of areas by this plant, significantly reducing the biodiversity of the area. As discussed by Axtell et. al., Lesser Celandine has been linked with reductions in wildlife habitat and wildlife food sources, and these plants can prevent the growth of forest species by growing over seedlings and young vegetation; reducing the complexity for forest ecosystems by removing forest structures.

Native and Non-Invasive Alternatives

Leatherwood (*Dirca palustris*)

Leatherwood, also known as Moosewood, Ropebark and Wicopy, is a shrub species native to Ontario. This species is present as far north as the Algoma district (see *Figure 10*), and prefers shady habitat in the understory of mixed deciduous forests. It is said to have historical significance, and was thought to have been used by First Nations cultures in the crafting of string and rope from the bark of the bush (the origin of the name Ropebark) (Northern Ontario Plant Database, 2014).

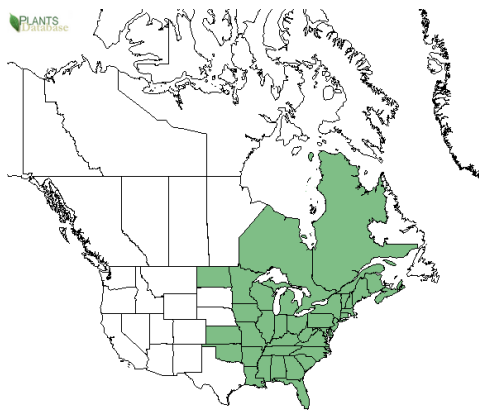


Figure 10. Native range of Leatherwood (*Dirca palustris*) in North America, NRCS, 2014.

Gardening Information

Plant Category: Shrub

Light Requirements: Light Shade

Flowers: Pale yellow, drooping flowers, bright yellow foliage in fall

Height: 1.2-1.8 m

Blooming Period: Late Winter/Early Spring

Hardiness: USDA Zone 9a, 9b, 10a, 10b, 11

Soil Moisture: Medium Soils

Benefits: Shelter for small mammals

As seen in *Figure 11*, this shrub has bright yellow foliage in the fall, and during the summer produces pale, drooping yellow flowers. This is a good native alternative plant for use in landscaping to create understory structures, and also provides shelter for wildlife in urban environments (Conservation Halton, 2000).



Figure 11. Leatherwood (*Dirca Palustris*) changing colour in the fall, Foltz, 2014.

Buttonbush (*Cephalanthus occidentalis*)

Buttonbush is indigenous to Ontario, and provides significant support to wildlife by being considered one of the top ten nectar sources for butterflies in the United States

(Barnes, 2014). This bush can be found throughout the United States as far south as Florida, as well as throughout Canada from the east coast to Ontario. This plant can be found in a wide variety of habitats including wet grasslands, oak forests as well as maple, beech and birch forests. This plant is an important species not only for pollinators, but also for deer that browse on the foliage and waterfowl that eat the seeds that are produced (Faber-Langendoen and Maycock, 1989).

Gardening Information

Plant Category: Bush

Light Requirements: Sun to Partial Shade

Flowers: Round, white globes of white flower clusters

Height: 3-3.6 m

Blooming Period: Mid-Summer

Hardiness: USDA Zone 5a, 5b, 6a, 6b, 7a, 7b, 8a, 8b, 9a, 9b, 10a, 10b

Soil Moisture: Medium-Moist soils

Benefits: Important nectar plant for butterflies, deer browse, seeds food for waterfowl



Figure 12. Buttonbush plant, Brooks, 2014.

Arrowwood (*Viburnum recognitum*)

Arrowwood, also known as Smooth Arrowwood, Northern Arrowwood and Southern Arrowwood is a bush that has a range spanning along the eastern regions of

Canada and the United States (see Figure 6). This species prefers hydric or moist soils, and can grow upwards of twelve feet tall with the appropriate space. It develops clusters of small white flowers in the spring, and has a prominent toothed edge to its foliage (Figure 14).

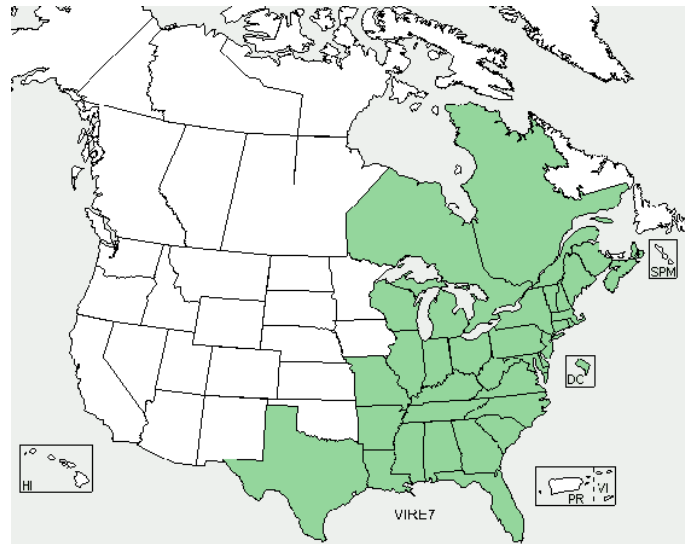


Figure 13. Geographic range of Smooth Arrowwood in North America, Ontario Trees and Shrubs, 2014.

Gardening Information

Plant Category: Bush

Light Requirements: Partial-Full Sun

Flowers: Clusters of small white flowers

Height: Up to 12 feet

Blooming Period: Spring

Hardiness: USDA Zone 4a, 4b, 5a, 5b, 6a, 6b, 7a, 7b, 8a, 8b

Soil Moisture: Moist soils

Benefits: Nectar for insects, berries for birds and small mammals

This species can be well utilized for edge landscaping, and provides a number of different benefits to wildlife. The flowers are known to provide nectar to different pollinators including bees, butterflies and other insects, and the small berries that it produces is food for birds as well as mammals such as chipmunks, red squirrels and mice (Gamiing, 2014).



Figure 14. Smooth Arrowwood. Muma, 2014.

Cardinal Flower (*Lobelia cardinalis*)

The Cardinal Flower is a perennial wildflower native to Ontario, but has a wide geographic range into the southern United States (see *Figure 16*). This plant inhabits stream banks and moist habitats, and is able to tolerate full or partial sunlight. This plant is able to effectively self-seed (Gamiing, 2014).

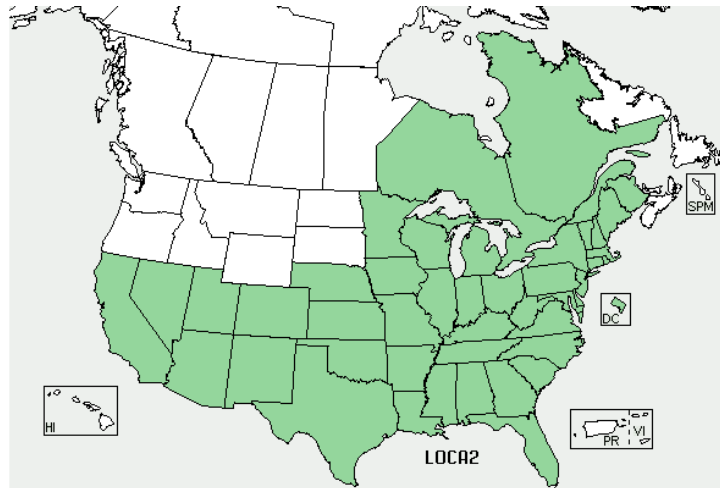


Figure 15. Range of Cardinal Flower (*Lobelia cardinalis*), Ontario Wildflowers, 2014.

Cardinal Flowers bloom between June and September, and exhibit large, bright red flowers in small clusters (see *Figure 16*). This is an important food source plant for nectar-feeding birds such as hummingbirds. This plant also has a long history of use by different aboriginal groups such as the Iroquois and Meskwaki peoples, who used the stems, roots and blossoms of Cardinal Flowers for medicines, tea, as ceremonial tobacco during celebrations (Natural Resource Conservation Service, 2014).

Gardening Information

Plant Category: Herb

Light Requirements: Full-partial Shade

Flowers: Red clusters of blossoms

Height: Up to 1.2 m

Blooming Period: June and September

Hardiness: USDA Zone 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b, 6a, 6b, 7a, 7b, 8a, 8b, 9a, 9b, 10a, 10b

Soil Moisture: Moist soils, riparian areas

Benefits: Nectar for hummingbirds



Figure 16. Cardinal Flower (*Lobelia cardinalis*), Ontario Wildflowers, 2014.

Conclusion

Invasive plants represent a significant ecological threat to our natural systems, and to the biodiversity of our environment. By providing nurseries, garden centres and the public with non-invasive alternatives to plant in their gardens, the horticulture industry can become less of a pathway for these exotic species to be transported into our region where they may develop invasive tendencies. From feedback collected from past participating nurseries from the Grow Me Instead Nursery Recognition Program, the aesthetic appeal of recommended alternative species was identified as an important factor in plant selection by customers. Educational materials such as a guide of invasive plants and alternatives was well received and engaged the interest of customers of these nurseries, illustrating that there is a desire for more ecologically informed choices by the residents of Ontario for what plants they decide to put in their gardens. Through education of the public as well as industry partners, the spread and distribution of invasive plants can be better managed in the province of Ontario, and more ecologically beneficial plant species can be grown in urban areas; a change that will indirectly improve the wildlife habitat in these human-sculpted natural landscapes.

Part Two: Program Outreach

As part of the outreach component for this project, nurseries were contacted via telephone to see if they would be interested in participating in the Grow Me Instead

Program for 2015. The Otonabee Region Conservation Authority as well as the Lower Trenton Conservation Authority provided a list of nurseries to contact. The tables below outline the results of the telephone inquiries from these two areas.

Table 1. Otonabee Watershed Nurseries Contacted

NURSER Y	ADDRESS	CONTACT NAME	PHONE #	INTERESTED IN PARTICIPATI NG	NOTES
Keene On Gardens Inc.	1589 Keene Road	Lynne	705-760- 9485		Opens April 25th; answering machine
Fisher Russel Nursery	954 Sandyhook Road		705-277- 2806	No	
Greenhous e On The River	4115 County Road 32, Lakefield	Peter Green	705-652- 8154	Yes	Please contact via email at thegreenhouse@bellne t.ca
Griffin's Greenhous e	3026 Lakefield Road		705-652- 8638	No	
Hotner's Greenhous e and Garden Centre	1550 Lansdowne W		NOT IN SERVICE	~	
Johnston's Greenhous e and Garden Centre	871 Crawford Drive	Chris Heckel	705-745- 3042	Maybe	Please send information via email to gert217@hotmail.com , will forward to owner who is out of the country
Peterborou	2200	John	705-743-	Yes	Please phone with

gh Landscape Supply	Keene Road	Walsh	1428		information
Marjo's Garden Nook	480 Otonabee Drive		INCORRE CT #	~	
Garden's Plus	136 County Road 4, Peterborou gh		705-742- 5918		Answering Machine

Table 2. Lower Trenton Watershed Nurseries Contacted

NURSERY	ADDRESS	CONTACT NAME	PHONE #	INTERESTED IN PARTICIPATING	NOTES
Connon Nurseries	956A Old Highway #2, RR#2, Trenton	Kevin Vanderkruk	905- 689- 7433		Currently on holidays; head office number provided
Hollandale Landscaping & Garden Centre	16662 Hwy 2, Trenton		613- 392- 7806	Maybe	Owner away, will phone if interested
Wain's Greenhouses Garden Centre	214 Ontario Street, RR4, Brighton	Owen	613- 475- 0350	Maybe	Owner away, will phone if interested
Lorne Park Nurseries Ltd.	149 Peters Road, RR4, Colborne		9 05-355- 2688		Owner away, will phone if interested
Little Village Garden Centre	41 Adams Road, Trenton		613- 392- 4504		Closed for season, answering machine
Garden House Perennials	3929 County Road 25,		1-877- 344-		Name changed to Peonies from

	Castleton		5622		the Field, answering machine
The Garden Network	57 Maybe Road, Quinte West		613- 398- 8528		Answering Machine

When these businesses were contacted, common questions were brought up by the nurseries:

1. What changes do I have to make if I participate?
2. Is it free?
3. What types of species are you referring to as invasive?

In most cases, as soon as it was communicated that this was a free program, the business owners were positive about participating, or passing the information along to their managers. The two businesses that outright said that they were not interested in participating said it was because they did not want to make changes to their available plant lists. For those that did want to participate, the mention of ‘free’ was the most important factor in catching their attention, and making them want to learn more about the program.

Additional Outreach

Additional outreach was completed when the opportunities arose. On March 13, 2015, a presentation regarding OIPC and the Grow Me Instead Program was given to the public for the Three Minute Paper Competition at Trent University. This was a presentation providing an overview of the Grow Me Instead Program, the importance of invasive plant management, as well as information on the preliminary results of feedback surveys. This presentation did generate interest in the program, and a member

of a Peterborough horticultural society requested program specifics and OIPC contact information.

A presentation was also completed at the Community Innovation Forum, which was an event for students from Trent University and Fleming College to showcase their research projects. A poster was developed, and a booth was run displaying Grow Me Instead materials and answering questions for the attending public. From this event, another representative from a horticultural society showed interest in the Grow Me Instead program, and she was provided program brochures and the contact information for the OIPC. Also at this event, the program was discussed with other project host organizations, and from this Gamiing Nature Centre and Native Plant Nursery requested participation for 2015 and the Grow Me Instead Program. Their information is provided below:

NUR SERY	ADDRE SS	CONTACT NAME	PHONE #	INTERESTED IN PARTICIPATING
Gamiing Nature Centre	1884 Pigeon Lake Rd, Lindsay, Ontario, K9V 4R5	Meike Schipper	7 05-799- 7083	Yes

Part Three: Program Feedback Surveys

Introduction

As part of a fourth year community research project, a survey was developed to interview past participants of the Grow Me Instead Nursery Recognition Program that is managed by the Ontario Invasive Plant Council (OIPC). This survey was geared towards

gathering feedback from those nurseries, greenhouses or garden centres that participated in the program in 2013 and/or 2014, in order to improve the program for 2015. A survey was completed in collaboration with myself and Kellie Sherman; the OIPC Project Liaison and host organization supervisor for my community research project. The interviews were completed over the telephone with the exception of two emailed surveys, and were completed between December 2014 and March 2015.

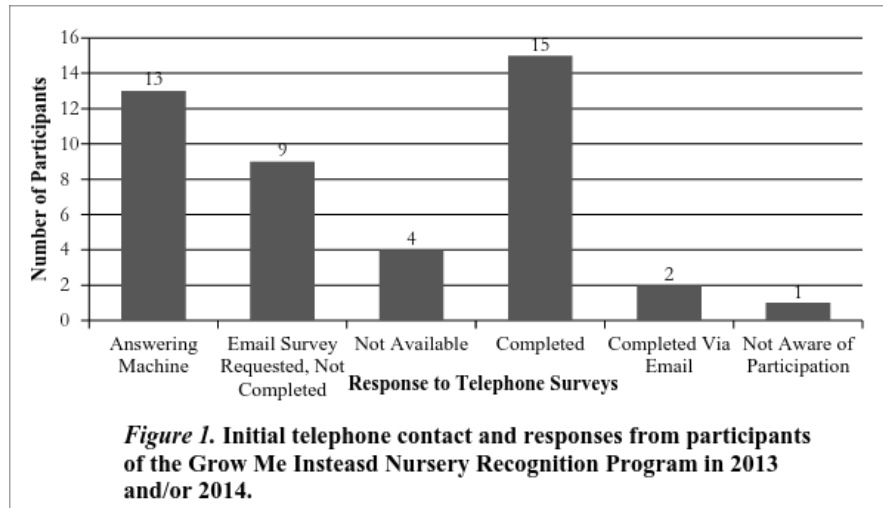
Preliminary Work

Before any surveys could be completed, an ethics review application needed to be completed because human subjects were being interviewed. Two reviews were submitted; one at the departmental level to the Environmental & Resource Studies office and a formal application with the Research Ethics Board of Trent University. The reviews were submitted in the month of October, and after a request for minor adjustments and clarifications to the application, both levels of review were accepted at the end of November. As part of the requirements of the acceptance, a consent form was also developed in order to verbally outline the rights of any participants in regards to their confidentiality, participation and access to information.

Surveys

Telephone interviews were conducted on December 4th, 2014, December 5th, 2014, January 21st, 2015 and March 11th, 2015 at the OIPC headquarters at the Ontario Federation of Anglers and Hunters building. Forty-four nurseries, greenhouses, and garden centres that participated in the Grow Me Instead Nursery Recognition Program in 2013 and 2014 were called between the hours of 9am and 3pm. Figure 1 illustrates the initial responses to the phone calls. Categories include completed surveys, requests for emailed surveys, and participants that were not able to be reached via telephone. One of the past participating businesses was not aware of any involvement with the program, and so this data provides a beneficial update to the list of current participants for the OIPC website and database. Many of the businesses were also either closed for the season, or

were too busy with the Christmas rush to feel that they could take the time to complete the survey, and only some businesses responded to the survey when contacted later in 2015.

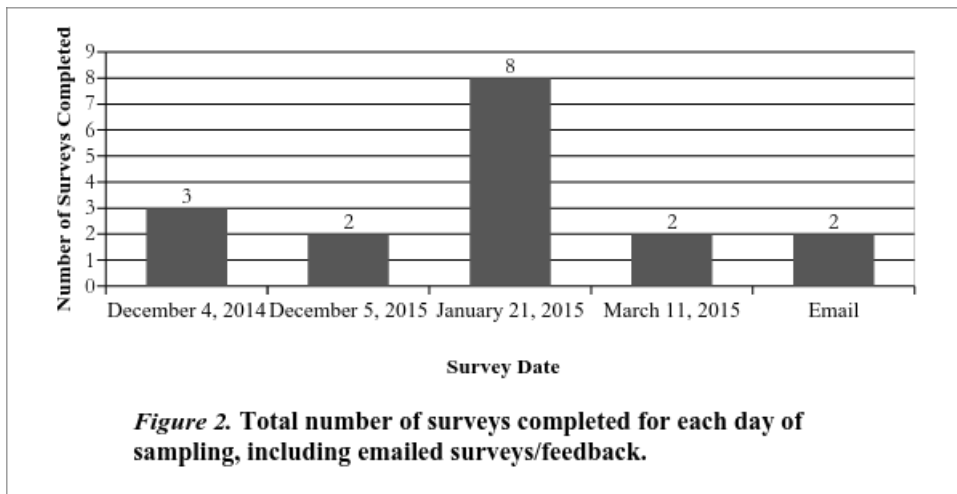


Survey Results

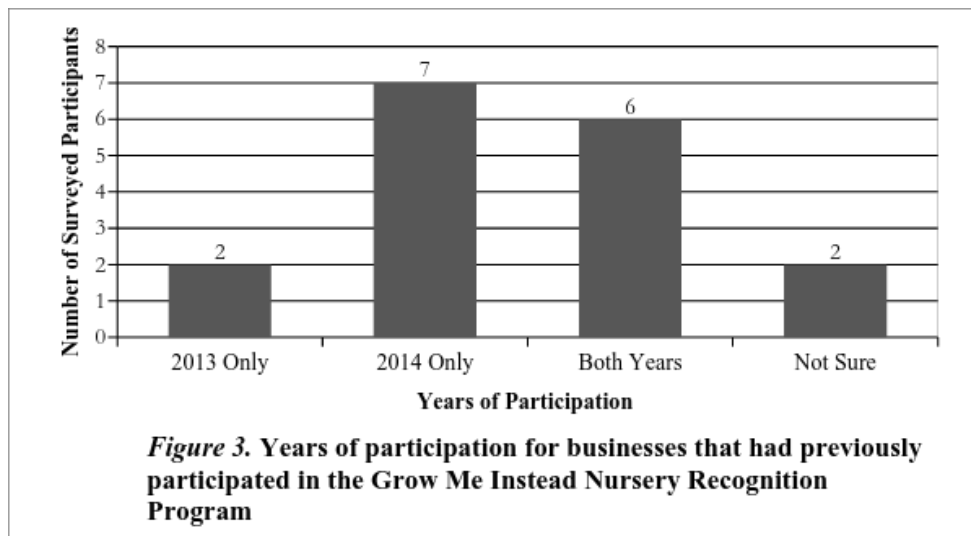
Over the study period, a total of seventeen surveys were completed of the forty-four nurseries that had participated in the Grow Me Instead Nursery Recognition Program in 2013, 2014 or both years. Most of these interviews were completed over the telephone, but there were two responses to the emailed surveys that were also completed. Of these two emailed surveys, one did not follow the structure of the survey, but still provided business data and program feedback.

Surveys were conducted over four sampling days, and surveys were also sent to nurseries that had requested this over the phone. *Figure 2* shows how many surveys were completed on each of the study days. Those businesses that were not available or reachable during an interview day were contacted on the following study day, and if still not reachable, were repeatedly called until the last interview day (March 11, 2015) was completed. Overall, the January 21, 2015 survey day was the most successful for survey completions, and appeared to be the most convenient time for the nursery participants to provide feedback. During the December interviews, multiple nurseries were either closed for the season or too busy with the Christmas rush to take the time to complete the

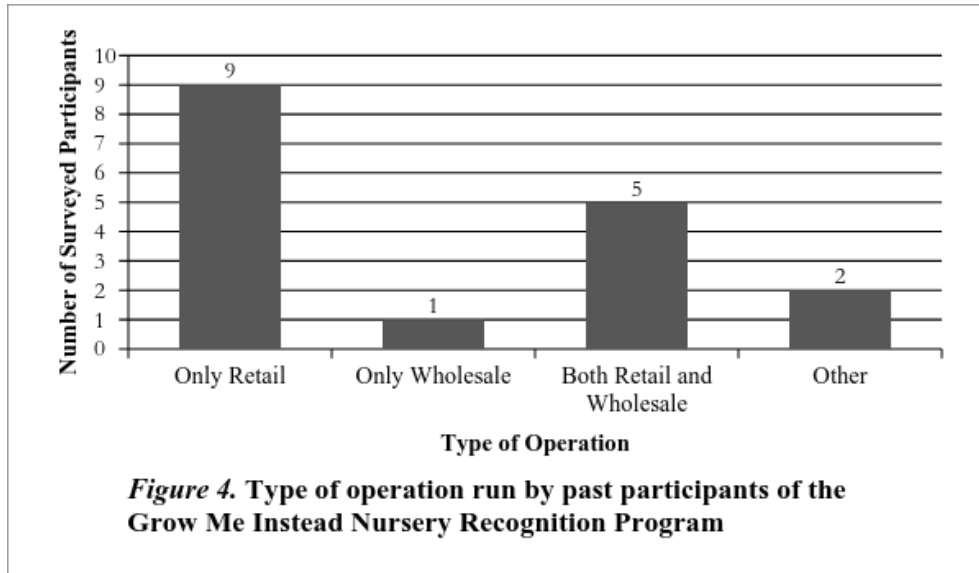
survey. During the March survey day, the most common reason for not completing the survey was that the nurseries were now too busy preparing for spring sales to complete a telephone interview. March was the most popular time period that nurseries requested emailed versions of the survey, so it should be noted that more survey results may be incoming later this season.



The following figures and tables depict the aggregated results to the survey questions asked during the interviews. Of the seventeen completed surveys, one email submission did not follow the survey format, but business data and program feedback was provided and will be incorporated into these results where appropriate.



For participation, most of the nurseries surveyed had only joined the program as of 2014, followed by those that had participated for both of the years since the program's inception. For the two businesses that did not participate in 2014 (but did in 2013), both had the same reason for not participating the following year. They stated that they were either not contacted by OIPC regarding continued participation, or received no follow up by OIPC as to how to continue their participation.



As seen in Figure 4, retail was the most common type of operation for these nurseries that were surveyed. Only two participants classified their businesses as 'Other'. For the one participant, they explained that they did a small amount of wholesale, but also shared product with other individual gardeners in the area. The second 'Other' participant stated that their operation was online only.

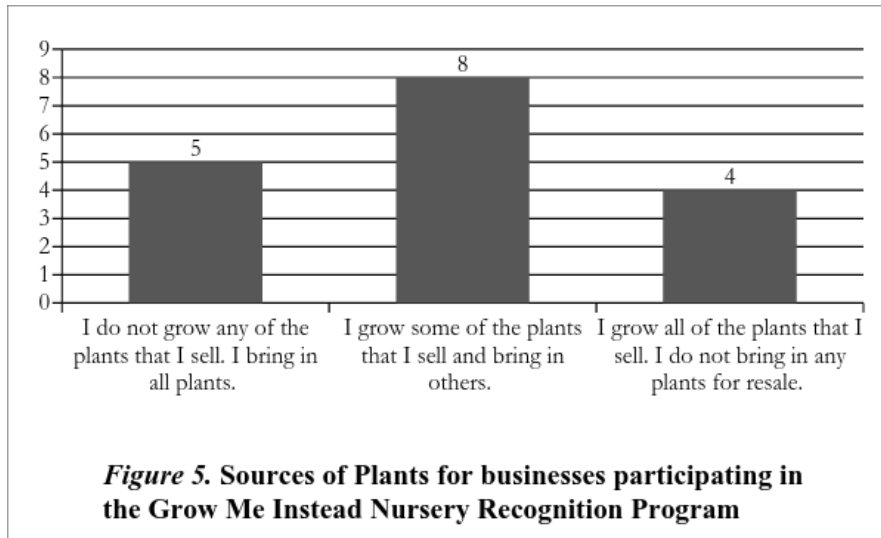
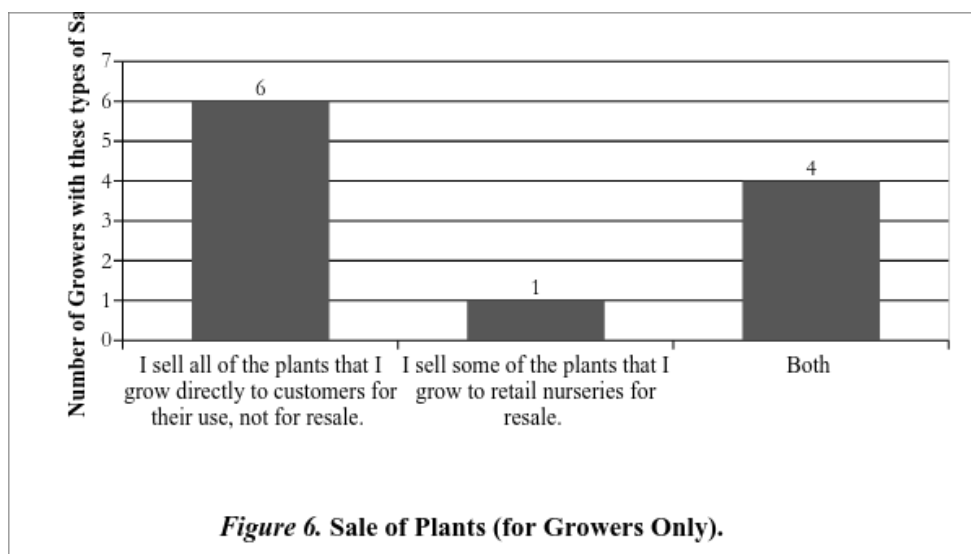
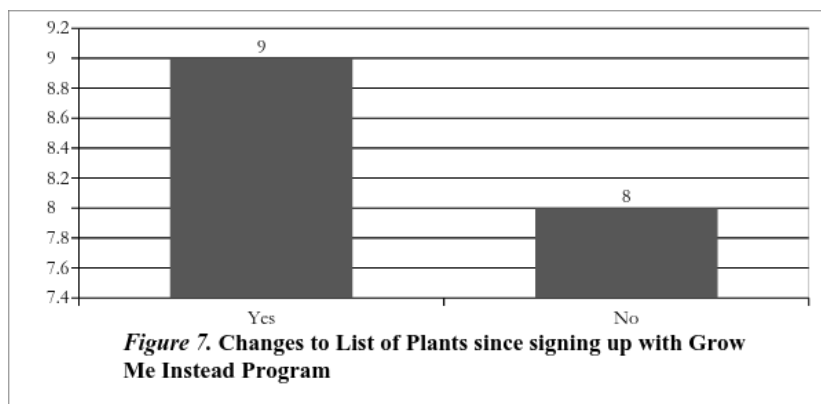


Figure 5 and Figure 6 illustrate where participants are receiving their plants from, as well as who their primary target is for distribution (such as directly to customers or to other retailers). These questions provide data on how the plant species are being distributed by the different businesses, as well as show how the nurseries might be relying on the import of plant species from other locations (and therefore increasing the risk of introducing plants that may become invasive). The most common source of plants was a combination of some being shipped in and some being grown by the nurseries, and the most common target market was the public, with plants being sold directly to customers instead of other businesses.





When nurseries stated that they did not make changes to their list of plants after joining the Grow Me Instead Nursery Recognition Program (i.e. introduce more alternative plants or stop providing certain invasive plants), there were three common comments that they made:

1. Suppliers dictate what is shipped in, amounts have not varied.
2. The changes took a while for the customers to get used to, and so it was a slow process to move plants out of sale.
3. The nurseries had already eliminated or reduced the sale of invasive plants prior to joining the program.

Table 1 provides an overview of the noticed increases in demand for alternative plants identified by header cards and featured in the guide. ‘Changes’ and ‘No Changes’ in demand of alternative species were evenly ranked with seven participants for each category, as well as one participant ‘Not Sure’ and two that were ‘Not Applicable’.

Table 1. For retail operations: Did you or your staff notice an increase in demand for the alternative plants identified by header cards in your store and featured in the guide?	
Yes/No/Not Applicable	Comments
No	Had reduced interest in alternatives.
No	Most people knew what they were looking for and going to purchase
Yes	Found an increase in sales from 2012 to 2013.

No	None
Yes	Would give a verbal explanation to customers regarding alternatives, and found that they would pay attention to the alternatives more because of the education provided by the program materials.
No	None
Not Applicable	No store front, no use of physical materials
No	None
Yes	None
Not Sure	None
Yes	None
Yes	Native more than just non-invasive alternatives
Yes	None
Yes	None
No	None
No	None
Not Applicable	No header cards were provided. Only native plants are sold at our nursery.

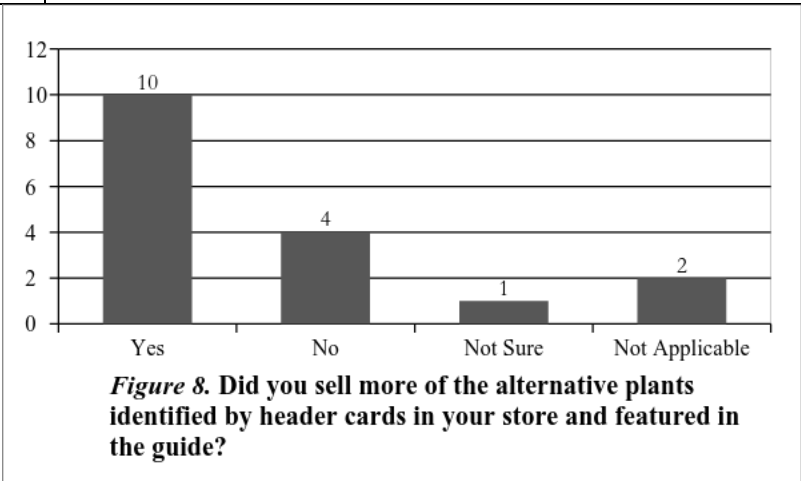


Table 2. Comments for the question: Did you sell more of the alternative plants identified by header cards in your store and featured in the guide?
Comments
More sales were evident in the retail side

Staff recommendations are the main cause for increased sales

Have noticed increases in general for the demand of native species

Some customers upset with the removal of invasive species with only the alternatives available.

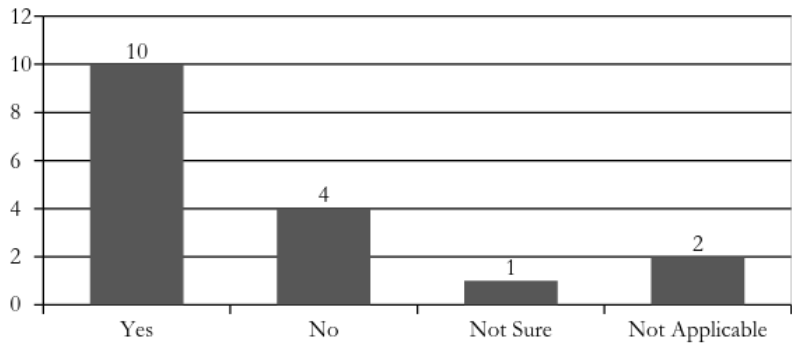


Figure 9. Did you sell fewer of the plants identified as invasive in the guide?

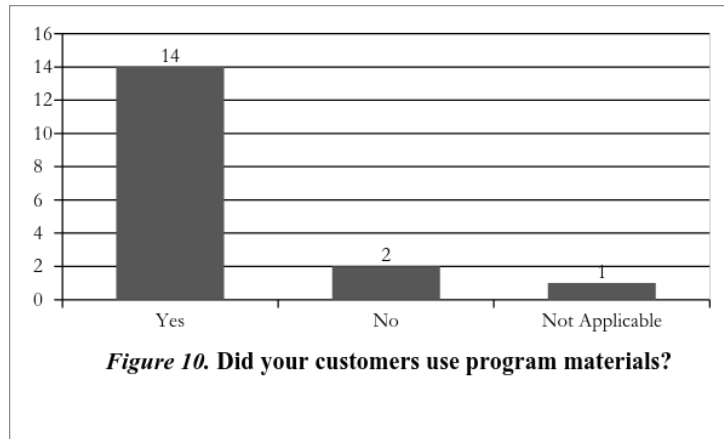


Figure 10. Did your customers use program materials?

Most of the participants interviewed were extremely positive about the usefulness of program materials, particularly the guide. As seen in *Table 3*, there was significant variability in the number of guides distributed by the nurseries, but comments inferred a desire of the public to have educational materials to learn more about invasive plants and alternatives.

Table 3. Did your customers use program materials? If so, how many guides would you say were taken in a season?

Yes/No	Comments
Yes	Customers were interested in the guide. Approximately 150 were taken.
Yes	People interested, but not actively distributing guides. No comment on number of guides taken.
No	None
Yes	Used all of the guides that were shipped to them by OIPC in single season.
Yes	Customers were interested in the guides. ½ of a box was used in a single season.
Yes	30 Guides.
Yes	5 booklets per season
No	None
Yes	200 guides
Yes	As guides that were provided by OIPC were used
Yes	5 guides
Yes	50 Guides
Yes	10 guides
Yes	40 guides
Yes	Not sure how many were distributed
Not Applicable	Online only
Yes	100 guides. Posters were most useful resource for customers

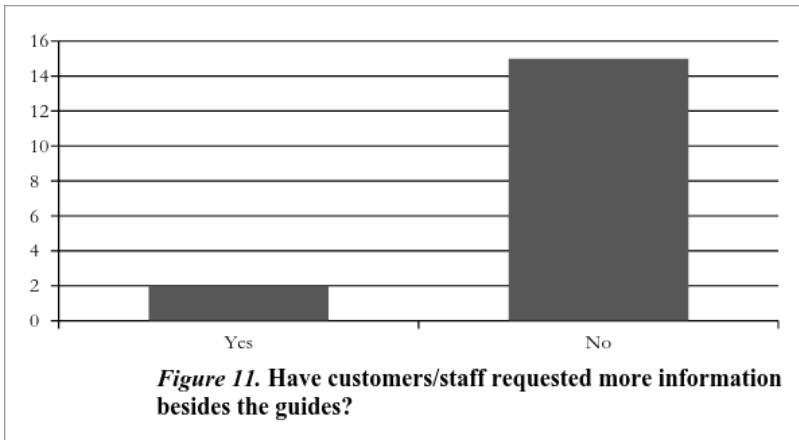
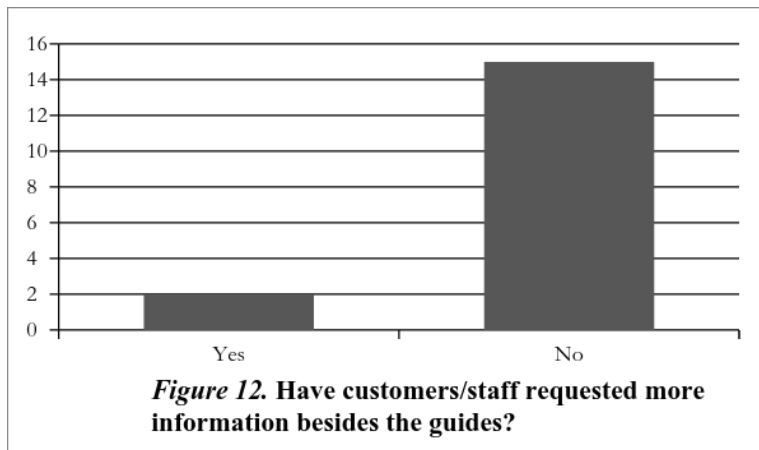


Table 4. Did any staff/customers request more information besides the guides?
Comments
Customers interested in reference guide to invasive plants
Email correspondence would be beneficial
It would be good to get updates on new invasives as they get added to the guide
It would be nice to see companionships of different non-invasives with trees and shrubs



While the majority of participants stated that they did not feel that any other materials were needed for the program, many were open to new materials or whatever information the OIPC could provide them with. Specific comments that were made are listed in *Table 5*.

Table 5. Are there any materials that you would like to see provided by the
--

program?
Comments
Materials are good. There are other materials already provided by other organizations such as the Woodlot Association, so no more are needed.
Does not feel that program materials make a difference with the public.
Had issues with the poster not lasting very long. Perhaps making more weather proof for the greenhouses?
Broader media sector information would be beneficial
Guide was good for people to see what was growing in their gardens and identify invasives.
Felt that the posters were more important than the guide for providing information to the public
Any information is helpful
Open to the distribution of new materials
One nice poster with all of the invasive plants would be beneficial
Felt that the program covered everything very well

Comment Portion

For the comment portion of the survey, a wide variety of answers were provided. Since graphical representation would have been difficult for these answers, the comments have been listed below for each corresponding question.

What did you particularly like about the program?

Comment 1: Liked the brochures. It was good to have something for the customers to walk away with, and to have something for the customer to do something with (read, look at later). Felt that those that were sincere would keep the guide and use it more than once.

Comment 2: Liked the attempt to reach out to people. It is good to remind people from all sides about invasive species.

Comment 3: Really liked the brochure. It was well laid out, and it is nice for people to have the good and bad laid out beside each other.

Comment 4: This is a good program, and is very knowledgeable.

Comment 5: The guide makes it easy for customers to see what is in their garden.

Comment 6: Liked the posters.

Comment 7: The program is user-friendly, positive, not preachy, and generally customers like it.

Comment 8: The program went over well and people have done their research (in regards to invasives and alternatives).

Comment 9: The program gave people information to help plant alternatives. Positive feedback.

Comment 10: We like the information to be able to hand out to customers.

Comment 11: The pamphlets are informative, and we like the layout.

Comment 12: The program is informative.

Comment 13: We like that the program is free.

Comment 14: The program is good in that it introduces native species to customers and the public in general.

What did you particularly dislike about the program?

Comment 1: The program needs more advertising. The comment was made that little correspondence occurred with representatives of the program in 2014.

Comment 2: Feels that the program is falling on deaf ears, and that the public is not receptive to the program information.

Comment 3: Disliked the pamphlets. People dislike clutter.

Other participants provided no comments for dislikes for the program.

What changes would you make to improve the program?

Comment 1: Send garden centres emails to address new information regarding invasives and alternatives in addition to the guide. Would be good to find out about plants that are now considered invasive and information as it becomes available. Follows on the Facebook page, but perhaps utilize other forms of updating participants.

Comment 2: No improvements. The program provides a good assortment of information.

Comment 3: Advertise the program more and maintain better contact with participants/follow-up with businesses.

Comment 4: Bring public awareness on a larger scale, and perhaps utilize other forms of social media.

Comment 5: Information for websites for the nurseries.

Comment 6: We would like to suggest that there be a greater involvement of nurseries on the Council. Nurseries both grow the plants that you wish to promote and, conversely, take a very serious hit when their stock is suddenly unwanted, if deemed invasive. We would love to join in the conversation, rather than be caught in the wake behind.

Comment 7: Create a good-sized poster with a summary of invasive plant information.

Comment 8: Have more variety in the posters. The posters catch customers' eyes, particularly because the guide might be information overload for them.

Comment 9: No improvements, but we need to experience the full season of the program before we can provide any changes or improvements.

Comment 10: Target distribution outside of garden centres, and move to more broad media. Most people know what they want to get before coming into the garden centres, so try to reach them before they get there.

Other participants provided no feedback for this question.

Are there any types of plants that you would like to see more information on in the guide, or more information about alternatives?

Comment 1: Royal Empress Tree. This is a weed that someone is trying to promote in London, ON for carbon sequestration uses.

Comment 2: No. Fine the way it is.

Comment 3: Include more ornamental native or non-invasive plants, something that would be more appealing to customers.

Comment 4: No. Good assortment provided.

Comment 5: Customers have been asking about Pau Pau Trees, and Red Oaks (how to properly plant). Invasives are covered and the selection of alternatives provided is good.

Comment 6: Identify which of the plants in the guide are native and which are not. That would make the guide more of a useful reference.

Comment 7: Perhaps provide more native plants over non-invasive alternatives.

Comment 8: Provide appropriate trees for street planting-native material.

Comment 9: More on current invasives.

Comment 10: Provide more flowering non-invasives.

Other participants provided no feedback for this question.

Please use the space below to provide feedback from staff and customers regarding the program in general, in-store posters and header cards, and guides.

Comment 1: Positive feedback. Most common comment received is “I didn’t know that was invasive”. Most people are ignorant to invasive species in on their own properties.

Comment 2: No feedback.

Comment 3: Feedback from customers, many say “oh my, I just planted one of those”. The program is a good educational tool to inform people about invasive plants and help them to identify them.

Comment 4: No feedback.

Comment 5: No feedback.

Other participants provided no feedback for this question.

Concluding Questions of the Interviews

All seventeen of the participants interviewed indicated that they would like to participate in 2015 in the Grow Me Instead Recognition Program. Some of the participants of the interview provided the names of other nurseries or garden centres that might be interested in also participating in the program. These are listed in *Table 6*.

Table 6. Name and contact information of other nurseries or garden centres that may be interested in participating in the Grow Me Instead Nursery Recognition Program.	
Orchard Farm	Windsor Area, no other contact information provided
Giboshi Hill	No contact information provided
Johnson's Greenhouse	Peterborough, Ontario
Landscape Ontario	Will be able to pass information along to landscapers and other nurseries, no contact information provided
Predawn Nursery and Garden Centre	519-969-2255, Joe Mandato
Huronia Nurseries	(705) 322-1994
Ritchies Garden Centre	705-322-2363
Springwater Garden Centre	(705) 322-2389

Conclusions

While less than half of all past participating nurseries could be interviewed during this study, the results of the surveys provide important data for evaluating the effectiveness of the Grow Me Instead Nursery Recognition Program. Overall, nurseries that participated in this program experienced decreases in sales of invasive plants and increases in the sale of plants identified in the guide as alternatives (either native or non-

invasive species). Fourteen of the seventeen participants stated that customers were using program materials, illustrating that the public is engaging with the Grow Me Instead Program and is being educated in collaboration with these industry partners.

For future outreach and program improvements, it would be beneficial for contact to be made with the participants in January, since this provided the highest success rate for completed surveys. This time period also falls in between the Christmas rush and the preparation for spring stock inventories, and so nursery managers and owners will be more likely to take the time to complete interviews. When nurseries have joined the program, developing clear avenues of communication and ongoing follow-ups would be beneficial to ensure participant satisfaction and future involvement in the program. Also, based on the responses of different nurseries, an email/online based survey may be useful in collecting more feedback from nurseries, as this would allow the surveys to be completed when time is available instead of just within the hours of 9am-3pm as conducted for this study.

All participants commented on the positive merits of the program, and there were very few negative comments regarding issues with the program. The main improvement that was identified by these participants was that the program should be advertised more effectively, and that more communication should occur between OIPC and the participating businesses such as follow-up contact for following year's participation and for updates of information on invasive plants and native or non-invasive alternatives. Other comments included that providing public information on invasive species outside of the nurseries would be beneficial. Some of the participants stated that customers had species in mind to purchase before they came into their establishments, and so focusing on educating the public about invasive species before they come to shop would help them to make educated purchasing choices. The guide was identified as a useful piece of educational material along with the posters, and other information provided through social mass media as well as email updates to the nurseries was also acknowledged as a potential program improvement.

In conclusion, these nurseries have been able to provide important feedback on how this program has engaged the public and influenced the sale of invasive plants in

Ontario. These interviews have shown that voluntary, industry-targeted programs like the Grow Me Instead Nursery Recognition Program are successful in managing the distribution and spread of invasive plants through horticulture. Industry partners are willing to not only educate customers, but also play an active role in managing invasive plants and conserving our ecosystems through the promotion of non-invasive plant alternatives. By keeping nurseries up to date on invasive plant and alternative plant species, as well as utilizing social media to educate the public before they decide what species to garden with, the Grow Me Instead Nursery Recognition Program will continue to aid the OIPC's efforts to manage the spread of invasive plants throughout the province.

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Appendix: Feedback Survey

Grow Me Instead Feedback Survey: 2013 – 2014 Nurseries

Nursery Name:

Part 1

1. What year(s) did you participate in the Grow Me Instead Program?

- 2013
- 2014

If the answer is 2014, or 2013 and 2014, continue to answer questions in Part 3 only. If the answer is 2013 only, continue to answer questions in Part 2 and skip Part 3.

Part 2

2. Could you provide some feedback on why you chose not to participate in 2014?

Explain if applicable:

Although you did not participate in 2014, would you be willing to answer some questions about your experience with the program in 2013?

What type of operation do you run? Choose all that apply.

- Retail
- Wholesale
- Other, please explain:

If you have a retail business, choose one of the following:

- I do not grow any of the plants that I sell. I bring in all plants.
- I grow some of the plants that I sell and bring in others.
- I grow all of the plants that I sell. I do not bring in any plants for resale.

If you are a grower, please choose one of the following:

- I sell all of the plants that I grow directly to customers for their use, not for resale.
- I sell some of the plants that I grow to retail nurseries for resale.
- Other, please explain:

Have you made any changes to your list of plants (that you grow and/or sell) from participating in 2013 as a Grow Me Instead partner?

- Yes
- No

Comments:

For retail operations: Did you or your staff notice an increase in demand for the alternative plants identified by header cards in your store and featured in the guide? Compare 2012 to 2013.

- Yes
- No

Comments:

Did you sell more of the alternative plants identified by header cards in your store and featured in the guide? Compare 2012 to 2013.

- Yes
- No

Comments:

Did you sell fewer of the plants identified as invasive in the guide? Compare 2012 to 2013.

- Yes

- No

Did your customers use program materials? If so, how many guides would you say were taken in 2013?

Explain:

Did any staff/customers request more information besides the guides?

- Yes
- No

Comments:

Comments:

Was there anything you particularly liked about the program when you participated in 2013?

If some improvements/changes were made to the program, would you consider rejoining in 2015?

What changes would you make to improve the program?

Are there any types of plants that you would like to see more information on in the guide, or more information about alternatives?

Explain:

Use the space below to provide feedback from staff and customers regarding the program in general, in-store posters and header cards, and guides.

Do you know of another nursery/garden centre that may be interested in participating in 2015?

- Yes
- No

If yes, please provide name(s) and contact information.

Part 3.

What type of operation do you run? Choose all that apply.

- Retail
- Wholesale
- Other, please explain:

If you have a retail business, choose one of the following:

- I do not grow any of the plants that I sell. I bring in all plants.

- I grow some of the plants that I sell and bring in others.
- I grow all of the plants that I sell. I do not bring in any plants for resale.

If you are a grower, please choose one of the following:

- I sell all of the plants that I grow directly to customers for their use, not for resale.
- I sell some of the plants that I grow to retail nurseries for resale.
- Other, please explain:

Have you made any changes to your list of plants (that you grow and/or sell) since signing-up as a Grow Me Instead partner?

- Yes
- No

Comments:

For retail operations....Have you or your staff noticed an increase in demand for the alternative plants identified by header cards in your store and featured in the guide?

- Yes
- No

Comments:

Have you sold more of the alternative plants identified by header cards in your store and featured in the guide?

- Yes
- No

Comments:

Have you sold fewer of the plants identified as invasive in the guide?

- Yes
- No

Have your customers been using program materials? If so, how many guides would you say have been taken in a season?

Explain:

Have staff/customers requested more information besides the guides?

- Yes
- No

Comments:

Are there any materials that you would like to see provided by the program?

Explain:

Comments:

What did you particularly like about the program?

What did you particularly dislike about the program?

What changes would you make to improve the program?

Are there any types of plants that you would like to see more information on in the guide, or more information about alternatives?

Explain:

Please use the space below to provide feedback from staff and customers regarding the program in general, in-store posters and header cards, and guides.

Would you like to participate in Grow Me Instead again in 2015?

- Yes
- No

Please explain:

Do you know of another nursery/garden centre that may be interested in participating in 2015?

- Yes
- No

If yes, please provide name(s) and contact information. _____

For more information, please contact:

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