

Merry  
Christmas



# CROSS POLLINATION

Halton Master Gardeners Monthly Newsletter  
DECEMBER 2025 | VOL. 18 ISSUE 11

## In this issue:

Eastern Dwarf Mistletoe  
[Page 01](#)

Monthly Garden 'To-Do' List  
[Page 04](#)

Electroculture for Plant Growth  
[Page 05](#)

Frost and Foliage:  
The Art of the Winter Garden  
[Page 07](#)

Spotlight on Science:  
Tulipomania  
[Page 10](#)

Question of the Month  
What are best uses of Fall's  
fallen leaves?  
[Page 12](#)

Garden Inspiration  
What makes a good Garden  
Journal?  
[Page 13](#)

What's Growing On  
[Page 14](#)



Halton Region  
Master Gardeners



Image: Mistletoe Joseph O'Brien, USDA Forest Service, Bugwood.org

## Eastern Dwarf Mistletoe, *Arceuthobium pusillum*

By Tinamarie Jones, Halton Master Gardeners

It's getting cold outside, so this is the perfect time to talk about mistletoe! You may be surprised to learn that there is a mistletoe that is native to Ontario. But, our native mistletoe is not the mistletoe you are used to seeing, decorating doorways and allowing the unsuspecting to be drawn under it for a kiss. The mistletoe plants we most closely associate with winter and winter holidays are non-native: European Mistletoe, *Viscum album* or American Mistletoe, *Phoradendron leucarpum* or *P. serotinum*. These are often referred to as 'true' mistletoes. European Mistletoe grows throughout Europe and American Mistletoe has a native range throughout North America, (south from New Jersey to Florida and as far west as Texas) but it does not grow in Ontario.

So, what kind of mistletoe is native to Canada? The answer is Dwarf Mistletoe! There are two dwarf mistletoes native to Canada: Eastern Dwarf Mistletoe, *Arceuthobium pusillum* and Lodgepole Pine Dwarf Mistletoe, *Arceuthobium americanum*. Although Lodgepole Pine Dwarf Mistletoe is the most widely distributed dwarf mistletoe species throughout North America, it is only found in Canada from Manitoba to British Columbia. Only *Arceuthobium pusillum* grows from Saskatchewan to Newfoundland and southwards to New Jersey and Pennsylvania. Therefore, in order to discuss mistletoe native to the Ontario region, we will focus upon Eastern Dwarf Mistletoe, *Arceuthobium pusillum*.

Continued on next page

**EASTERN DWARF MISTLETOE – ARCEUTHOBIMUM PUSILLUM (CONT'D)**

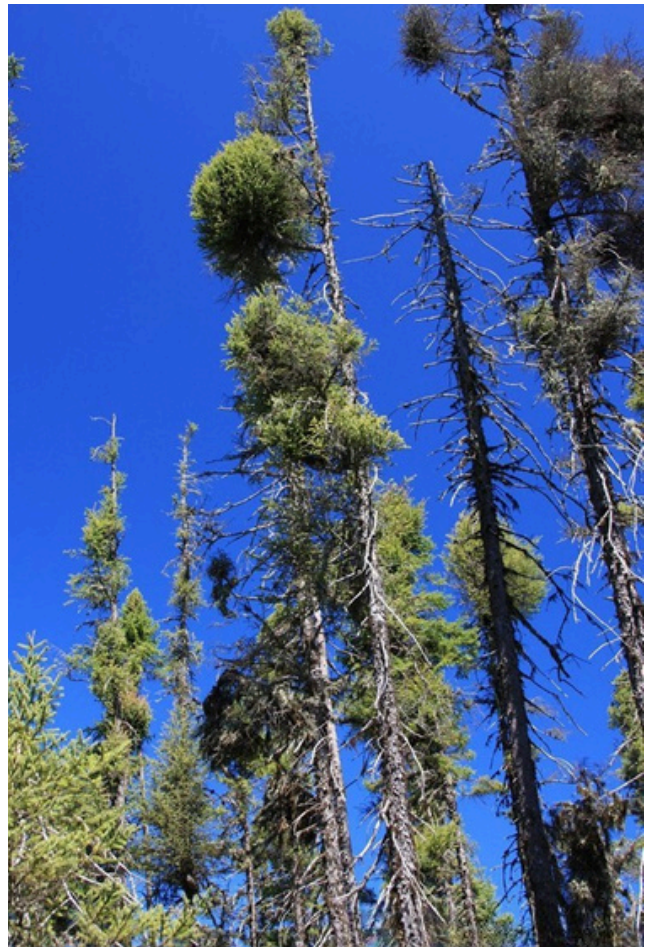
Eastern Dwarf Mistletoe is a member of the [Santalaceae](#) or mistletoe family and is a perennial. Like all members of the mistletoe family, it is a [hemiparasite](#). This means that its ability to generate food for itself is severely limited and therefore it must rely on a host plant for the bulk of its nutrients. Although Eastern Dwarf Mistletoe can be found on several conifer host plants such as Spruces, Pines, and Firs, it prefers Black Spruce, *Picea mariana*.

The discovery of this plant is attributed to Lucy Millington. She came across what she believed to be a previously unrecorded plant and in 1870 contacted the Torrey Botanical Club (believed to be the oldest Botanical Society in the Americas) to report her find.

In terms of appearance, Eastern Dwarf Mistletoe lives up to its name. The plant is very small, standing no more than two inches tall with scant leaves which are scale-like, fleshy and very tiny. The leaves are connate and opposite, with blunt tips.

The Eastern Dwarf Mistletoe is dioecious, meaning it has separate male and female flowers. The male flower sports a single tiny blossom at the top of the stem. This flower is less than 2 millimetres in size and has 3-4 egg shaped petals and a matching number of yellow stamens. In comparison, the female flowers emerge from leaf axils along the stem and have 2-3 egg shaped petals. The flower colours are unremarkable, ranging from green to muddy orange to red. There is no discernible scent. Interestingly, the stems supporting male flowers are shorter than the stems supporting female flowers. However, the male flowers bloom before the female flowers, which is unusual amongst dioecious plants. Pollination is carried out by the wind and by insects..

In terms of fruit, the Dwarf Eastern Mistletoe produces a tiny oval berry which matures in late summer. Once these ripen, the plant forcefully ejects the seed from the berry.



*There was a single stand of Lodgepole Pine Dwarf Mistletoe discovered in northern Ontario in the 1960s but it was successfully eradicated.*

As the berry drops off from the pedicel, the seed is rapidly ejected. Covered in a sticky film, the seed's initial velocity can reach speeds of up to 60 miles an hour and land between 10 and 16 metres away.

The stems of the plant are short and simple with very little branching, and they emerge from the bark of the host plant. The stems are round but become more squarish when the plant becomes dry.

The lifecycle of the Dwarf Eastern Mistletoe is particularly interesting and remarkably lengthy. If a seed is fortunate enough to land and remain on a suitable host plant, the seed germinates in the following spring and sends out tiny root like structures into the bark of the host tree.

Continued on next page

## EASTERN DWARF MISTLETOE – *ARCEUTHOBIUM PUSILLUM* (CONT'D)

These structures are called haustoria, meaning 'that which draws in or drinks' in Latin. These structures are also referred to as 'sinks'. The haustoria allow the developing mistletoe to successfully anchor itself to the host and is the means for the plant to obtain nutrients from the host. If the tree is more than 5 years old, the sinks will be unable to penetrate the thicker bark; however, younger trees are very susceptible to becoming mistletoe hosts. Having penetrated the bark on twigs and branches, the germinating plant starts to take nutrients from the host and grow under the bark. Aerial shoots form and become visible on the host 2 years after germination occurs. Flowers are produced in the third year, between April and June.

Given the speedy and haphazard way seeds are ejected from the plant, it comes as no surprise that fewer than 50% of seeds successfully germinate. Fortunately, the sticky coating on the seeds helps them adhere to a host plant. Given the sticky coating on the seeds, it is also possible that birds as well as insects may carry seeds to a new host.

The effects on the host plant become noticeable in time. The mistletoe itself is not remarkable and can be difficult to discern on the host as it is a very small plant which can be easily overlooked by the naked eye, or mistaken for the foliage of the host plant. However, one of the most distinctive indicators of a tree infected by Eastern Dwarf Mistletoe is the emergence of so-called 'witches' brooms'. These thickened overgrowths of stems and twigs are a visual indicator of the effect the parasitic mistletoe is having on the host. In addition, a tree infected with Eastern Dwarf Mistletoe will start to thin out at the crown. Although it may take years, the parasitic mistletoe will eventually kill the tree. Unfortunately, mistletoe is one of the largest threats to the Canadian lumber industry and one of the most difficult threats to defend against. By the time the mistletoe becomes visible, the damage is already well underway.

### NAME OF PLANT - DETAILS AT A GLANCE



DAPPLED SUN

FULL SUN



MOIST

MEDIUM

**Plant Type, Family:** Santalaceae

**Height/Width:** (H) 2.54 cm (1") (W) 2.54 cm (1")

**Features:** Prefers conifer trees in moist, well-drained, acidic soil.

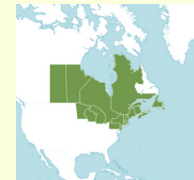
**Faunal value:** Flies, beetles & wasps ingest minute amounts of nectar present in tiny flowers.

Eastern Dwarf Mistletoe is a host plant for Hyperparasitic Fungus, *Caliciopsis arceuthobii*.

**Spread:** Sinks make it difficult to identify single plants.

**Native Range:** Manitoba to Newfoundland

**Supports:**



[Plants of the World Range](#)

Faunal associations are quite limited, with flies, beetles and wasps occasionally visiting the plant and ingesting the miniscule amount of nectar present in the tiny flowers. The plant is not a primary food source for any wildlife; however, Eastern Dwarf Mistletoe is ironically the preferred host plant for the Hyperparasitic Fungus, *Caliciopsis arceuthobii*. Infection can cause a decrease in mistletoe seeds as well as the death of the mistletoe plant itself. Infection can be observed as black masses on the female flowers and fruit.

### Resources consulted:

- [Minnesota Wildflowers](#)
- [Government of Canada](#)
- [Commonwealth of Massachusetts](#)
- [Northern Woodlands Magazine](#)
- [Lady Bird Johnston Wildlife Center](#)
- [New Jersey Department of Wildlife Protection](#)
- [Flora of Newfoundland and Labrador](#)
- [Forest Pathology](#)





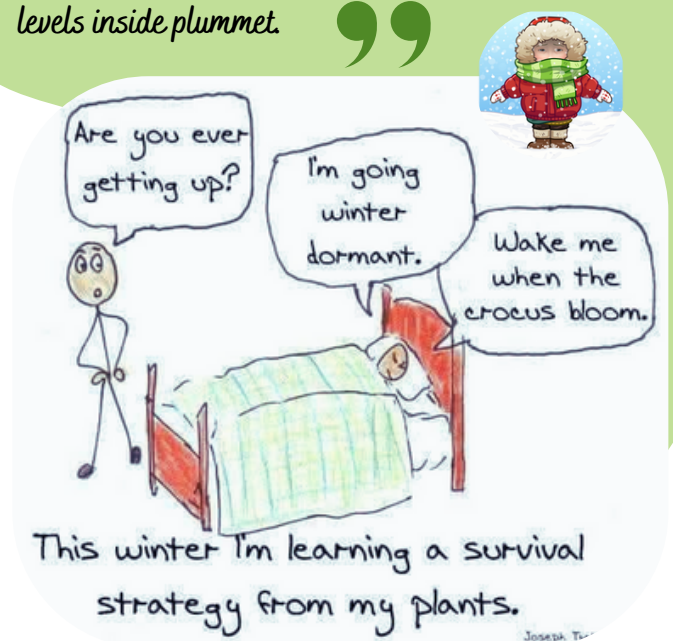
**DECEMBER GARDEN 'TO DO' LIST**

By Claudette Sims, Halton Master Gardener

- ☐ **Final Garden Check** – Last chance to put away watering cans, garden equipment, hoses and anything that might freeze!
- ☐ **Trees** – Make sure young trees and shrubs are protected from rabbits. Use tree wraps or wire baskets placed over smaller plants. Plan major tree or shrub pruning now while branches are bare and it's not too cold.
- ☐ **Houseplants** – Check weekly for disease or pests. Remove dead or dying foliage. Always check the soil before watering.
- ☐ **Amaryllis** – Pot up your amaryllis. Choose a pot 1-2 inches larger in diameter than the bulb, and at least 5 inches deep with good drainage holes. Add a light indoor potting mix and then place the bulb (roots down & pointy side up) in the pot. Add soil to within an inch of the top so that about ½ to 2/3 of the bulb is showing. Water well, avoiding water on the neck of the bulb.
- ☐ **Stems, Seedheads, Berries** – Leave seedheads and stalks intact over the winter. Consider adding some native berry shrubs to help birds get through the winter!



**Plant Dormancy**  
*Plants go dormant to help them face adversity. Trees lose their leaves to conserve water and energy, and houseplants go dormant when the humidity and light levels inside plummet.*



- ☐ **Lawn** – If you still have leaves on your lawn, rake them into the garden (or bag/compost to store for spring mulching), when the weather permits. Avoid walking on your lawn if the soil is soft and leaves footprints.
- ☐ **Food Crops** – Cover carrots, parsnips and newly planted garlic with straw to harvest in the spring. Collect rose hips and hawthorns for jelly or tea.
- ☐ **Bulbs** – Get those bulbs in the ground before it freezes solid!
- ☐ **Live Christmas Trees** – [Pre-register](#) to donate your tree to the RBG or cut it up and return branches and logs to your garden to start your new brush pile! Remember to remove all decorations and tinsel.
- ☐ **Winter Sowing** – Need more native plants? Learn how to [winter sow](#). Need native plant seeds? Check your local library or [Green Venture](#) for free seeds.
- ☐ **Happy New Year!** A reminder that there is NO Cross Pollination Newsletter in January.





## Electroculture to Support Plant Growth

Christina Bilbrk, Halton Master Gardeners

There is a little-known technology that can “accelerate the growth rate of your plants, increase yields, and improve crop quality” that involves “the application of electricity, magnetism, monochrome light, and sound” (Barinov, 2012, p.2). This technology is called Electroculture, and can protect plants from diseases, insects and even frost! (Wallender, 2024). According to Barinov (2012), bigger crops can be grown by farmers in less time, with less effort, fertilizer, pesticides and at a lower cost. There are various approaches to Electroculture; a few include using static electricity, antennas, direct current and/or the alternating of a current (Barinov, 2012). By utilizing any of these approaches the seeds, plants, soil, water and nutrients can receive the energy to their benefit (Barinov, 2012; Wallender, 2024).



Monstera Thai Constellation plant with electroculture rod inside the pot. Image: C. Bilbrk, 2025.



Home made electro-culture rods consisting of copper wire and wooden sticks. Image: C. Bilbrk, 2025.

Christofloreau's system included a twenty-five foot tall wooden pole that had a vertically positioned metal pointer, and an antenna. He soldered copper and zinc strips together to “generate electricity from solar heat” (Barinov, 2012, p.2) and set poles 10 feet apart, connected by wires extending just under 1 kilometre (Barinov, 2012).

Many researchers hypothesize that lightening can fix atmospheric nitrogen into a solid form (which is nitrate). The nitrate can dissolve into raindrops which “enter the soil system, thereby benefiting plants” (Sheehan, 2020, p.1). Wallender, 2024, writes about wind and rain generated electricity that accelerated pea seed germination by over 25%, and increased pea growth by 18%.

Continued on next page

**ELECTROCULTURE TO SUPPORT PLANT GROWTH (CONT'D)**

Copper wire roll (14 gauge) which can be found on Amazon. Image: C. Bilobrk, 2025.

For houseplant hobbyists and home gardeners, Electroculture can involve placing conductive materials such as metal rods, copper rods, or copper wire wrapped around a piece of wood into the soil around the plant (Sheehan, 2020). The purpose is for the device to act as an antenna which can “capture “free” energy, and direct it toward plants” (Sheehan, 2020, p.1). Those looking for a more active approach can apply an electrical current directly to the soil or plants.

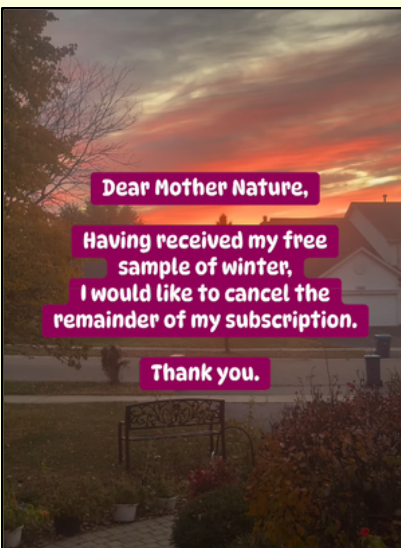
In summary, while Electroculture presents an intriguing approach to enhancing plant growth through electrical stimulation, and by the use of conductive materials like copper, the scientific community seems to remain cautious. The lack of robust, peer-reviewed studies means that the practice should be approached with skepticism until more conclusive evidence is available. For gardeners and farmers interested in exploring Electroculture, it is advisable to conduct small-scale experiments and monitor results carefully, keeping in mind the current scientific consensus on this matter. (Barinov, 2012; Sheehan, 2020; Wallender, 2024).

**Works Cited:**

- Barinov, A. 2012. [The effect of electricity on plant growth](#). No. 1535, Moscow (in English).
- Sheehan, L. (2024, July 24). [Electroculture](#). Washington State University.
- Wallender, L. (2024, August 28). [What Is Electroculture Gardening, and Does It Really Work?](#) The Spruce.
- Christofleau, J. [ElectroCulture](#)

**Gardening Humour FB**

Psst, here's a [better way!](#)





## Frost and Foliage: The Art of the Winter Garden

Tinamarie Jones, Halton Master Gardeners



Trees and shrubs lend structure to a winter garden. Photo: C. Sims

### Winter Magic

Every garden in summer is a magical thing – filled with colour and life, its beauty inspires and uplifts all who view it as well as the gardener who tends it. However, once fall arrives, most of us pack up our gloves and tools and head inside to stay warm, perhaps focus on next year's garden, and keep our hats on and our heads down, waiting for the promise of spring. Sadly, for the great majority of us, we assume the visual appeal of our garden ends once the first frost hits. Although the colder months do make it impossible to do the outdoor hands-on gardening many of us enjoy, even in the depths of winter every garden still offers interest. With a little planning and a willingness to view your garden in a new way, your space can be just as visually appealing in winter as it is in the summertime. The wintertime garden is an exciting opportunity to cultivate a different sort of beauty with a unique visual appeal. The suggestions below will help you uncover the potential in your garden to be transformed into a year-round delight!

### Guidelines – The Importance of Texture

While summer gardens make considerable visual impact through the use of colour, colder weather means that we cannot rely on the bright colours we find in cheery summer annuals and herbaceous perennials. Our winter palette is much more muted. This is not to suggest that the winter garden is dull or devoid of colour; however, colour must take a back seat in the colder months, acting more as an accent. With colour not as prominent, texture comes to the forefront. Texture is the primary means by which the winter garden makes its aesthetic impact.



Image: *Ginkgo biloba* by Tinamarie Jones

Continued on next page



## FROST AND FOLIAGE: THE ART OF THE WINTER GARDEN (CONT'D)

For interest in a winter garden, we want to incorporate a variety of textures, since different textures create interest and contrast that charm the eye.

You may have never considered looking at your garden from a textural perspective, so here are a few tips on how to start seeing your garden through a textural lens. There is no right or wrong way to go about doing this, but a good starting point is to consider the different textures that already exist in: tree bark; the texture and shape of tree and shrub branches; the differing heights of various plants in your garden; the unique look of perennial flowerheads and seedheads left standing after summer; and the incredibly diverse shapes of grasses available. Once you open your eyes to the endless textural variety available you can incorporate these into design elements that will start you on the path towards a satisfying winter garden aesthetic. Let's explore them one by one.

### Tree Bark

The incredible diversity of tree bark is an often-underutilized aspect of garden design in any season. Tree bark can: be flaky, like our native Kentucky Coffee Tree, *Gymnocladus dioica*; be bumpy or warty-looking like the Hackberry, *Celtis occidentalis*; have large cracks and curls like the Thornless Honey Locust, *Gleditsia triacanthos* var. *inermis*; or be strikingly white and peeling off in sheets like the Paper Birch, *Betula papyrifera*. Some trees, like the [Pin Cherry](#), *Prunus pensylvanica*, have very large noticeable lenticels, which give the bark a unique appearance.



Image: White Ash Tree Bark: [Credit Valley](#)

### Texture and Shape of Tree and Shrub Branches

Deciduous trees shed their leaves in winter, and the shape of the bare branches adds an almost architectural element to the garden, drawing the eye upward. For example, the natural zigzag branching of the Eastern Redbud, *Cercis canadensis* is interesting all by itself, but becomes an impressive winter focal point with even the slightest snowfall. The winter garden also creates an opportunity for us to better appreciate the distinctive vertical versus horizontal growth habits present. For example, in winter it is easier to appreciate the more horizontal branching of the [Kentucky Coffee Tree](#), *Gymnocladus dioica* and how beautifully it contrasts with the much more vertical growth habit of the Bartlett Pear Tree, *Pyrus communis* 'Bartlett'.

Unlike deciduous trees, most coniferous trees are evergreen and retain their needles and greenish colour throughout the winter. This adds not only a sweep of colour to the garden, helping to ground other elements in the winter palette, but also provides a welcome shelter for birds as well as a more solid shape which offsets the bare branches of other trees and shrubs nicely.

There are numerous [evergreen](#) options, ranging from the graceful, almost fluffy branches of the Canada or Eastern Hemlock, *Tsuga canadensis*, the more columnar shape of the Eastern Arborvitae, *Thuja occidentalis*, or the layered appearance of the silvery-blue branches of the [White Fir](#), *Abies concolor*. In addition to their colour, evergreen conifers also produce pinecones, and the wide variety of sizes from tiny to very large as well as presentation (along the branches or standing upright) creates additional visual interest and appeal. Coniferous evergreen shrubs are another option to consider for adding some [colour and shape to the winter garden](#).

Continued on next page

## FROST AND FOLIAGE: THE ART OF THE WINTER GARDEN (CONT'D)

A popular choice is the Common Juniper, *Juniperus communis*, whose blue berries provide a subtle bit of colour. [The Dwarf Thread Leaf False Cypress](#), *Chamaecyparis pisifera* 'Filifera Nana' has a lovely mop-like and drooping habit, with finely textured green foliage that gives a soft fluffy appearance.

Lastly, broadleaf evergreens, such as Blue Princess Holly, *Ilex x meserveae*, are a nice traditional choice for a winter garden, with the red fruit on female plants adding welcome colour and contrast to the glossy dark green leaves.

### Perennial Flowerheads, Seedheads, and Grasses

Many of the perennials that provide us with so much colour in the summertime can do double duty in the colder months. Instead of trimming off the dead flowers at the end of the season, consider leaving some of the sturdier and more interesting ones behind. The spent flowers of [Sedum 'Autumn Joy'](#), [Hylotelephium telephium](#) ('Herbstfreude') 'Autumn Joy', and [Purple Coneflower](#), *Echinacea purpurea* provide interesting shapes, texture, and movement in the garden, as well as food for visiting birds.

These spent flowerheads easily catch any snowfall, adding yet another dimension to their wintry beauty. Grasses like Little Bluestem, *Schizachyrium scoparium* and Switchgrass, *Panicum virgatum* are good additions which add height and movement, as well as contrasting textures.

### Colourful Accents

Once you have decided on the textures you want for your winter garden, it is time to consider adding plants that provide colourful highlights and contrast. Aside from evergreen foliage, berries provide most of our colour options in winter. We have already mentioned the red berries found on Holly, and Common Juniper's blue berries, but many other trees and shrubs have colourful berries also, such as the [Mountain Ash Tree](#), *Sorbus americana*, and the [Winterberry shrub](#), *Ilex verticillata*.

In addition, the [Red Osier Dogwood](#) shrub, *Cornus sericea* has colourful red branches that really stand out in the winter, especially against snow. If you are feeling adventurous, try planting [Witch Hazel](#), *Hamamelis virginiana*. This shrub blooms in late fall, with flowers sometimes seen as late as December or even January. The yellow, scraggly-petalled flowers are unique and become quite the focal point in a winter garden.

### Taking Stock and Planning

To plan a winter garden there is no need to overhaul the garden you already have. Simply modify points in your garden where there are aesthetic opportunities. The plant options listed above are not exhaustive but are a good starting point to spark your own creativity.

Start small, by taking a quick inventory. What trees and shrubs are already in place? Do they offer interesting bark? Berries? Cover for birds? What about your perennials? Consider which ones have flowers or seedheads that are sturdy and can remain over the winter. Do you have room to add an interesting shrub or some grasses? The answers to these questions will have you well on your way to crafting a beautiful winter garden that will provide you with year-round delight.

### Further Information

- [Winter Bark & Bough: A Valentine to Trees](#)
- [Native Grasses for Ontario Gardens](#)
- [Ontario Trees and Shrubs](#)
- [Peterborough and Area Master Gardeners - Winter Favorites](#)
- [In Our Nature - Native Plants for Stunning Winter Interest](#)
- [Gardenia - Create a Garden with Great Winter Interest](#)
- [Return of the Native - Creating Winter Beauty](#)
- [9 Evergreens Native to Ontario](#)
- [How Evergreens Provide a Winter Oasis for Wildlife](#)



## The Virus Behind the Beauty: How a Plant Disease Created the Famous Striped Tulip

By Nikolina Radulovich, Halton Master Gardeners



Few flowers have stirred as much wonder or economic chaos as the tulip. Those familiar, cup-shaped blooms that grace spring gardens were once at the center of a craze so wild it became known as [Tulipomania](#), the first recorded financial bubble in history. In 17th-century Holland, a single rare tulip bulb could be worth more than a craftsman's yearly wage, or even a townhouse on a canal in Amsterdam. And, the most prized of them all were the so-called "broken tulips": flowers streaked with mysterious flames and stripes of color that seemed painted by hand.

### A Beauty with a Secret

For decades, no one knew why these tulips "broke" from their solid color into such captivating patterns. The Dutch botanist Carolus Clusius, who first introduced tulips from Turkey to the Netherlands in the late 1500s, noticed that striped varieties were often weaker, smaller, and less fertile. Their beauty seemed to come with a cost. By the height of Tulipomania in the 1630s, these broken tulips were traded like gold, inspiring competition, theft, and speculation — until the [market suddenly collapsed](#), leaving fortunes lost and a new cautionary tale about human greed.

Yet the mystery of the tulip's stripes endured for centuries. Gardeners and scientists speculated endlessly if they were caused by soil conditions, weather, or breeding mistakes? It wasn't until 1928 that researchers Cayley and McKay finally identified the true cause: a virus, transmitted by tiny aphids feeding on tulip leaves. The very infection that weakened the plant was also what made it so beautiful.

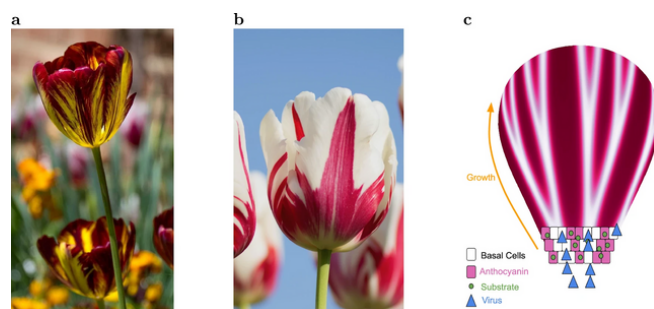
*Semper Augustus*, famous for being the most expensive tulip sold during tulip mania.



### When Disease Creates Art

The recent study by [Aidan Wong, Gustavo Carrero, and Thomas Hillen at the University of Alberta](#) brings this centuries-old mystery to rest. The team combined biology and mathematics to show how infection by the Tulip Breaking Virus (TBV) disrupts the petal's pigment anthocyanins, the same natural compounds that make cherries red and pansies purple.

Their model describes how the virus spreads unevenly through the tulip's petals, consuming the plant's internal "building blocks" (amino acids, proteins, and sugars), and preventing pigment from forming where the virus is active. Areas with heavy infection fade to pale yellow or white, while nearby uninfected tissue remains vivid. This creates those iconic flames, feathers, and streaks seen in varieties such as *Absalon* and *Carnaval de Rio*.



**Panel (a)** shows *Tulipa Absalon*, one of the rare surviving "true" broken tulips whose yellow streaks are caused by tulip breaking virus rather than genetics. The pale yellow regions mark areas where pigment has been suppressed by infection.

**Panel (b)** shows the variety *Carnaval de Rio*, another tulip displaying dramatic color variation.

**Panel (c)** illustrates the researchers' model, which depicts how the virus spreads through petal layers, consuming cell resources and reducing anthocyanin pigment production to form stripes.

Continued on next page



## THE VIRUS BEHIND THE BEAUTY (CONT'D)



The scientists even simulated the process digitally and found their predicted stripe patterns matched 17th-century Dutch paintings of broken tulips almost perfectly. It turns out that the tulip's colour changes are not random at all but the result of a mathematical dance between the virus and the pigment-producing cells — what researchers call an activator–substrate mechanism. The virus acts as the “activator,” spreading through the petal, while the pigments act as the “substrate,” forming wherever the virus is absent. Together, they create the delicate stripes that enchanted an entire nation.

### A Lesson from Tulipomania

Tulipomania was more than just a floral fad, it was a glimpse into the psychology of obsession and value. In 1637, at the height of the craze, some tulip bulbs sold for the price of a canal house. People traded bulbs they never saw, signing contracts for future delivery, only to watch the market collapse almost overnight. What drove this madness? A mixture of beauty, novelty, and speculation, all centered around flowers that owed their charm to a viral infection.

The irony is profound: the very “disease” that made tulips beautiful also made them fragile and short-lived. Once infected, tulips weakened over generations until they eventually faded out, making each bloom even rarer and more desirable. In a way, the entire Dutch economy was shaken by a plant virus.

Today, horticulturists understand that the virus stunts growth and can spread quickly through a collection, so true “broken” tulips are rarely found outside of botanical archives. The famous Absalon variety, for example, still exists but is carefully protected and not available for public sale. Instead, modern breeders have created virus-free hybrids that safely mimic those classic striped patterns through genetic selection.

### The Science Beneath the Beauty

The research team's work doesn't just solve a historical puzzle — it opens a window into how patterns form in nature. Their mathematical model builds on theories by Alan Turing (yes, the same Turing known for his work on computers) and Lewis Wolpert, who described how chemical signals and genetic cues create structure during growth. By simulating how petals expand and how viruses move through growing tissue, the scientists recreated tulip stripes that shift and evolve as the flower matures. This combination of mathematics, biology, and art shows that beauty can arise even from something as destructive as a virus. It's a reminder that many of nature's wonders are the result of balance between chaos and control.

### What Gardeners Can Take Away

For gardeners, the story of the broken tulip is both a caution and an inspiration. It reminds us how easily plant diseases can spread — aphids, fungi, and viruses often travel invisibly from one plant to another — and why vigilance and hygiene are essential. But it also reminds us that beauty and imperfection often go hand in hand. When you next admire the variegated blooms of a tulip or a streaked petunia, remember that these patterns have deep roots in history, science, and chance. Behind every patch of color is a story that connects your backyard flower bed to the rise and fall of economies, to art, and to the subtle intelligence of nature itself.

Tulip Breaking Virus (TBV) causes the stunning striped patterns once prized in the 1600s, but it also weakens and eventually kills the bulb. Modern striped tulips achieve the same look safely through breeding. If you see irregular color streaks in your own flowers, it's best to suspect a virus, not a miracle, and isolate the plant to protect your garden.





By Hariette Henry, Halton Master Gardener

There are many [things you can do with leaves](#) and most of them are highly beneficial to your garden.

[Using leaves as mulch](#) is one of the first things to consider. You can either blow them onto your garden beds whole or add them after the leaves have been shredded. Whole leaf mulch relies on a diversity of organisms to break the leaves down into smaller bits. Beetles, millipedes, slugs, woodlice and worms are among the hundreds of creatures that feed on and fragment leaf litter. Ground leaves tend to stay in place better than whole leaves, especially if they are moist. However, chopping them up reduces their volume but may destroy the habitat and beneficial insects that are completing their life cycle in the leaf litter. Either way leaf litter will help to suppress weeds, conserve moisture, regulate soil temperature, and reduce soil erosion in your garden beds.

Another option for making good use of leaves is to [make leaf mold](#).

Leaf mold is a dark, crumbly, earthy, soil-like material created through the slow decomposition of rotting leaves. It is a process driven mainly by fungi. Leaf mold is an excellent soil amendment that improves soil structure, moisture retention and drainage, and can be used to suppress weeds or as a component in potting mixes.

There are a couple of ways of making leaf mold. The first is to pile the leaves into a 3' or 4' square, wood or wire bin in a corner of your yard.



*What can I do with the mountain of leaves that have fallen on my property?*



Pile up the leaves and thoroughly dampen them. Let them sit, checking the moisture level occasionally during dry periods and add water as necessary.

The second method is to fill large plastic garbage bags with leaves and moisten them with water. Seal the bags and then cut small holes or slits into the bags for airflow. Check the bags periodically and moisten the contents if the leaves seem dry. I usually fill up my bin first and then use bags when the bin gets full.

Leaves can be used as a compost ingredient. Traditional compost combines a variety of green and brown materials (leaves) that break down faster due to higher microbial activity and temperature, providing a balanced nutrient profile for plants. [Both are valuable soil amendments](#). Leaf mold excels in enhancing soil texture, while traditional compost supplies more immediate fertility benefits.

### A Comparison of Leaf Mold versus Traditional Compost

Soil Amendment	Leaf Mold	Traditional Compost
Primary Material	Decayed Leaves	Mixed organic waste
Decomposition Rate	Slower (6 mos. to 2 yrs)	Faster (2 to 6 mos.)
Texture	Crumbly, soil-like	Rich, dark, granular
Nutrient content	Low nitrogen, high humus	Balanced nitrogen, phosphorus, potassium
Best Use	Soil conditioner/moisture retention	Soil amendment, fertilizer
pH Level	Neutral to slightly acidic (6.0 - 7.0)	Neutral to slightly alkaline (6.5 - 8.0)
Microbial Activity	Fungal - dominated	Bacterial - dominated



Gardendif.com by T Wiseman, last Updated Feb 5, 2025

Whether you leave your fallen leaves on your garden beds, turn them into leaf mold or compost, or place them at the curb for municipal collection, those leaves remain an important resource. They continue to support the environment long after they've fallen, playing a crucial role in maintaining healthy ecosystems.





## Garden Inspiration!

# What Makes a Good Garden Journal

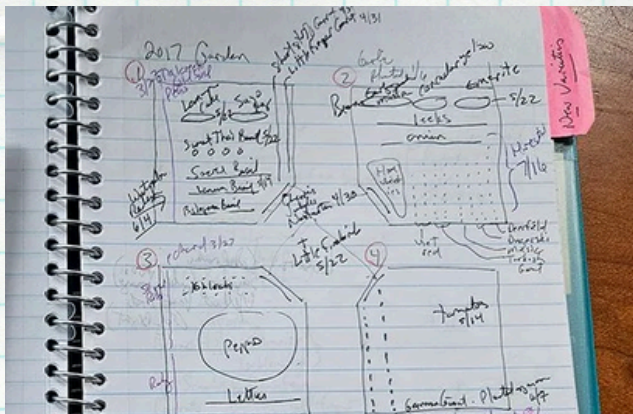
Finally, some down time! It's a great time of year to capture thoughts about how your gardening season went, and organize the garden photos on your phone. And with major gift giving holidays coming up, now might also be the time to put in a request for a garden journal. That said, a plain paper notebook or a spreadsheet might work better for your specific needs.



Dark Eyed Junco. Source: [Jocelyn Anderson](#), CC0, via Wikipedia Commons

## Diagrams of Planting Beds

Nothing fancy needed - [just enough information to remind you](#) where you wanted the Black-Eyed Susans to grow and where the spinach should come up.



Sketch of garden bed plantings. Source: [extension.psu.edu](#)

## Favourite Annual Events

For me, it's when the [juncos](#) arrive in the fall, and when the [Aquilegia canadensis](#) starts blooming in the spring. Knowing when I should start looking for them adds to the joy.

### Sources

- Elaine Richards. UC Master Gardeners of Alameda Co. [Keeping a Garden Journal](#)
- Deborah J. Benoit, University of Vermont. [Seven Essentials to Put in a Garden Journal](#)

## Important Dates

Write down your [first, and last, frost dates](#). The difference between them is the length of your growing season. Compare this with the *Days-to-Harvest* info on seed packets.



Green tomato seedling. Source: [getarchives.net](#)

## What Worked, What Didn't

Enough said. Capturing any special circumstances that might have led to that result will aid future planting decisions.



Tomato blossoms. Source: [Sanjay Acharya, CC BY-SA 3.0, Wikimedia Commons](#)





# What's Growing On?

By Trish Moraghan, Halton Master Gardener



Winter  
Wonders

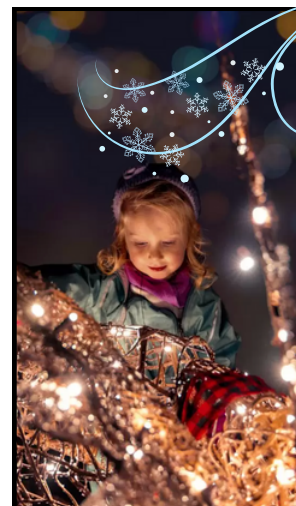


Train  
Displays

REG Express



[Learn more here](#)



Winterlit

Mountsberg  
Conservation Area  
December 31, 2025  
to  
February, 2026

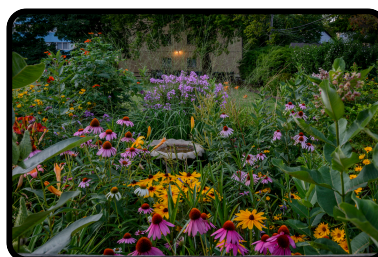
[Learn more here](#)



Learn From Home With Virtual Workshops



[Winter Twig Tree I.D.](#)



[Garden Fundamentals](#)



[Growing Orchids](#)

# What's Growing On?



## Donate Your Christmas Tree



[Learn more here](#)



HALTON REGION MASTER GARDENERS

## Explore our collection of resources to read archived articles

▼ Indoor Gardening (Houseplants, Tropicals & Seasonals)

- Ailing Pothos: Question of the Month – March 2025
- Amaryllis Care – December 2020
- Caring for Orchids February 2025
- Fungus Gnats – April 2020
- Fungus Gnats: Fungus Gnat Season is Here: November

## [Newsletter Index](#)



## [Conifers](#)



## [Poinsettias](#)



## [Holiday Decor](#)



## [Amaryllis](#)



Check our [calendar](#) for events

### About Our Newsletter

Cross Pollination is published monthly from February to December and is written and prepared by our dedicated volunteers. Halton Master Gardeners are experienced gardeners who have studied horticulture extensively and continue to upgrade their skills through technical training. We strive to provide science-based, sustainable gardening information to the general public. The information in our newsletter has been verified by our volunteers to the best of our abilities, but given the scope of horticulture and science some concepts may not reflect current knowledge. The content displayed in our newsletter is the intellectual property of Halton Region Master Gardeners and their authors. It can be shared in its entirety, but specific content should not be reused, republished or reprinted without the author's consent.

Copy Editor: Isabel Belanger

Content Editor: Olga Marranca

Your [donations](#) support our work!