



## Native Plant to Know

# Groundnut

*Apios americana*

by Angelique Mori

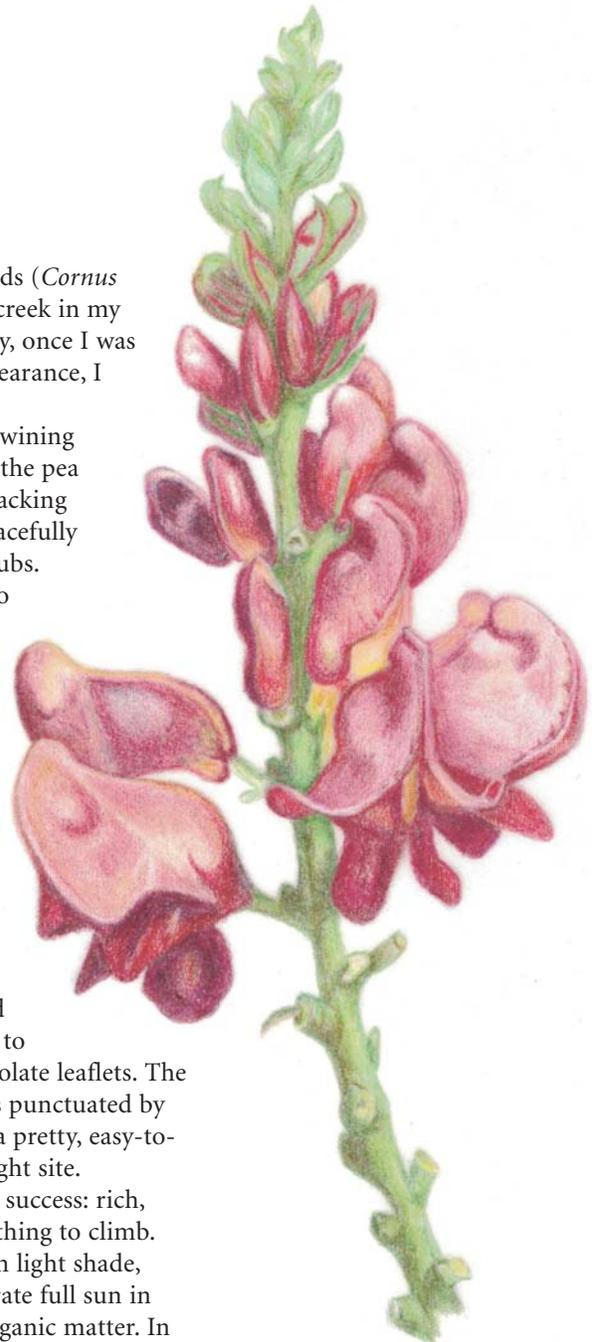
Groundnut (*Apios americana*) was a widespread staple in the diet of the First Nations and critical to the survival of the early colonists. And yet, few of us have ever heard of it, except foragers and permaculture farmers. It is theorized that knowledge of this plant was simply forgotten by Europeans who wanted to distance themselves from their “unrefined” pioneer roots and consume more “civilized” fare. What’s more, historic Canadian government legislation seeking to assimilate First Nations resulted in a disastrous loss of Indigenous culture, including traditional foods.

*Apios americana* goes by several less common names: hopniss, potato bean, bog potato or pig potato. *Apios* – derived from the Greek for “pear” – alludes to the shape of the tubers. The species name refers to its wide distribution across eastern North America.

An illuminating presentation on edible natives by author Lorraine Johnson introduced me to groundnut and inspired a botanical quest. The plant is unknown in the horticultural trades, but I succeeded in obtaining tubers from a local permaculture farm. Shortly afterwards, I discovered a volunteer colony tumbling wildly

through the dogwoods (*Cornus* spp.) bordering the creek in my own backyard! Oddly, once I was familiar with its appearance, I saw it everywhere.

This herbaceous, twining vine is a member of the pea family (Fabaceae). Lacking tendrils, the stem gracefully entwines nearby shrubs. Charming maroon to reddish-brown, pea-like flowers are borne in fragrant, compact racemes that bloom from July to September. The exquisite, individual blossoms, though small, are worthy of close observation. Pinnately compound leaves consist of five to nine toothless, lanceolate leaflets. The rope-like rootstalk is punctuated by globular tubers. It’s a pretty, easy-to-grow plant on the right site. Requirements for its success: rich, moist soil and something to climb. Groundnut thrives in light shade, although it will tolerate full sun in moist soil, rich in organic matter. In the wild it prefers riverbanks where nearby understorey growth provides



## The *Blazing Star* is . . .

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## NANPS Award Winners

We extend our hearty congratulations to the winners of the 2017 North American Native Plant Society awards and our thanks for their unflagging efforts to promote the conservation of native plants and ecosystems. The Richard Woolger Conservation Award went to Karen Abrahams of Native Plants In Claremont, while Karen Boniface, a former NANPS board member was named Volunteer of the Year.

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## NANPS Events at Toronto Botanical Garden

### NANPS SPEAKER SERIES

TWO PRESENTATIONS BY FORMER NANPS PRESIDENT PAUL LAPORTE  
at Toronto Botanical Garden, 777 Lawrence Avenue East, Toronto:

#### Tracing the Roots of Native Plants

Wednesday, April 11, 2018, 7:30 p.m.

A detailed examination of what defines a “native” plant with a focus on the evolution of plants and human impact.

#### A Swiftly Changing Landscape

Wednesday, April 25, 2018, 7:30 p.m.

A talk about the threats to native plants and the organisms that depend on them.

### DOCUMENTARY SCREENING

Saturday, April 21, 2018, 4 – 6 p.m.

*Hometown Habitat, Stories of Bringing Nature Home* is a 90-minute documentary that features renowned entomologist and NANPS Honorary Director Dr. Douglas Tallamy, whose research, books and lectures on the use of non-native plants in landscaping sound the alarm about habitat and species loss. Dr. Tallamy provides the narrative thread that challenges the notion that humans are here and nature is someplace else.

### NANPS ANNUAL NATIVE PLANT SALE

Saturday, May 5, 2018, 9:30 am - 2:30 p.m.

Hundreds of wildflowers, shrubs, trees, ferns, vines, sedges and grasses available. Pre-ordering available for NANPS members. We welcome donations of native plant cuttings, seedlings and seeds on sale day. Please label them with common and botanical names and indicate where the seeds were collected and what year.

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## NANPS Takes to the Road

### York Region's Seedy Saturday

March 3, 2018, 10 a.m. – 2 p.m.

Newmarket Community Centre and Lions Hall, Newmarket, Ontario

### NANPS at Canada Blooms

March 14-18, 2018

Enercare Centre, Toronto

Former NANPS president Lorraine Johnson will talk about growing native edibles.

### Scarborough Seedy Saturday

March 24, 2018, 11 a.m. to 4 p.m.

Blessed Cardinal Newman High School, 100 Brimley Rd. S., Scarborough, Ontario

### Peterborough Garden Show

April 13-15, 2018

Evinrude Centre, Peterborough, Ontario

### NANPS Plant Sale at Christie Pits

May 27, 2018

Christie Pits Park, Christie and Bloor, Toronto

# The Future of Ontario's Tree Seed Plant is at Risk

by *Melissa Spearing*

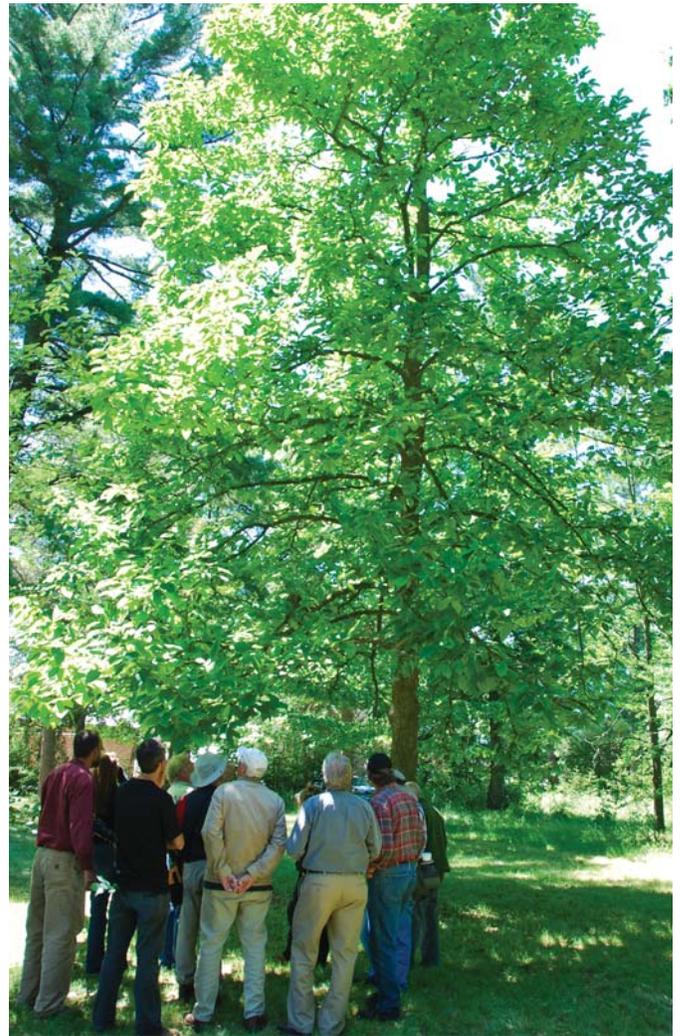
Since I was a kid, I have always loved a good tree hug. There is a cucumber tree (*Magnolia acuminata*) I enjoy hugging, planted far beyond its natural Carolinian habitat in Angus, Ontario, tucked among other living testaments of the humble but important work done by the Ontario Tree Seed Plant (OTSP).

This solitary magnolia is approximately 35 centimetres (14 inches) at breast height and just starting to show the characteristic bark pattern and rounded knobs of discarded lower branches. I first saw this beautiful specimen on a Certified Seed Collector course tour of the OTSP in August 2008, where I fell in love with the science and art of seed banking. The facility's former manager Brian Swaile was teaching participants tried-and-true techniques for forecasting, collecting and shipping seeds. He also taught us to question the quality of the seeds and to cut open samples of cones and fruit when surveying potential populations. He showed us how to find healthy, viable embryos because often seeds would form early in the season but be empty at maturity.

The OTSP magnolia stoically sets some lumpy fruit most years, but the germination experts at the facility have repeatedly tested the seeds and rarely found them viable; the tree needs to cross-pollinate in order to produce healthy, vigorous offspring. This was one of many "AHA!" moments of discovery at the facility. The choices made by seed collectors greatly influence the initial genetic and physiological quality of the next generation of seedlings and can determine how successful a planting project will be. Without validation from the grower, a germination test or expensive lab tests, seed collectors may unknowingly pass on narrowed gene pools to the next cohort and the landscape. I applaud the North American Native Plant Society for its efforts in conserving Shining Tree Woods, a far better breeding collection of parent cucumber trees than most planted specimens. Sadly, the perfectly huggable and rare tree at the OTSP facility may never find a suitable mate. Ontario's Ministry of Natural Resources and Forestry (MNRF) has decided to close the seed plant in September 2018.

Established in 1923 to supply Ontario nurseries with local seed, the unique OTSP facility provides expert processing and ensures frozen storage of billions of tree seeds, including common, and occasionally rare, native species. Over 15,000 kilograms (well over 33,000 pounds) of seed is stored, the bulk of it from Ontario's native conifers: Jack pine (*Pinus banksiana*), red pine (*Pinus resinosa*), white pine (*Pinus strobus*), black spruce (*Picea mariana*) and white spruce (*Picea glauca*). However, the seed plant has experience with over 60 species of native trees and shrubs and has experimented with processing native grasses as well. The OTSP's seed freezer holds over 500,000 hectares (over

one and a quarter million acres) of potential future forest. It is managed by six expert staff (and two cats who control seed-snatching vermin) with an annual budget of less than \$2 million. The shutdown decision came as a surprise in late August 2017 without any analysis of other delivery or cost-cutting options. Clients, stakeholders and the community were not consulted.



PHOTOGRAPH BY MELISSA SPEARING

*Certified Seed Collector trainees inspect the cucumber magnolia on the front lawn of the Ontario Tree Seed Plant in 2012.*

From 1923 until 1994, provincial (MNR) Seed Program staff planned for and managed large volumes of seed for government programs that annually planted over 100 million trees on Crown Land in Northern Ontario, and up to 20 million on private land in Southern Ontario, long before biodiversity, climate change or carbon offsets were hot topics. Those trees became the new forests that surround us today, many of which restored thousands of hectares of ecologically sensitive watersheds and soils

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Closeup of OTSP's magnolia in flower.

degraded by early agricultural clearing. Ontario was the leading province in hectares reforested from the 1920s until the 1980s, but all long-term trends include ups and downs and some are abrupt.

The OTSP was processing and distributing 1.1–1.4 billion seeds per year in the early 1990s, and was one of the largest and most sophisticated tree seed processing plants in Canada at the time. But in the mid-90s, cutbacks saw the provincial reforestation program dismantled. Tree nurseries, established by Premier E.C. Drury and chief forester Edmund Zavitz in the 1920s, were closed and sold, and plans were made to privatize the seed plant. The Forest Gene Conservation Association (FGCA), working with stakeholders, helped MNR management understand that tree seed services had irreplaceable ecological and social benefits. Even private

nurseries advocated for keeping the seed plant in public hands to provide incentives for the collection and use of native plants. In 1999, MNR leadership recognized the OTSP's critically important role in providing genetically adapted native seeds for planting programs.

The seed plant then began providing a greater diversity of native species seed to the horticultural sector, while still supporting the commercial forestry sector. The seed plant became a hub of technical expertise that worked well with the FGCA's Certified Seed Collector course to encourage and educate private nurseries to use appropriate seed sources. To date, this course has trained over 900 amateur or professional seed collectors teaching them why and how to label seed source. The OTSP's chain-of-custody database system worked with MNR's Seed Zone directive to ensure

that seed and stock were tracked and deployed back to the areas they were best adapted to. This system ensured that nurseries that operate solely for financial gain did not bring in seed and stock from undocumented or unknown sources without anyone to oversee the effects on native biodiversity or genetic adaptation to Ontario's climate. OTSP source-identified seed was the foundation for the 50 Million Tree Program in 2007; without it the program could not have been built.

Since 1994, the FGCA has worked closely with the Ontario Tree Seed Plant to help practitioners manage Ontario's native forest genetic resources. Together they have managed and deployed southern Ontario seed banks, managed southern Ontario grafted white pine seed orchards (which have become increasingly important to Crown forest reforestation programs in view of a changing climate), cloned endangered butternuts (*Juglans cinerea*) and established seed orchards on Crown land. They have assisted in coordinating native ash (*Fraxinus* spp.) seed collections ahead of the Emerald Ash Borer epidemic for long-term research and conservation at the National Tree Seed Centre. The FGCA also developed assisted migration strategies for important native tree species and helped partners establish eight assisted migration trials under the MNRF's Climate Change Initiative. Measured every 5-10 years, these research plots will provide valuable data to inform growth response under a changing climate and seed transfer limits for understudied species such as oaks, sugar maple and tulip tree. As the plots age, thriving trees will be managed for high-quality seed production for growers to utilize the more heat-adapted gene pool. This is yet another project the OTSP helped source and provide appropriate seed sources for. A great quote from a recent study of ecological restoration under climate change, "Having a seed

bank of ecologically and genetically diverse, source-identified native seed keeps our options open for future projects as restoration science catches up with restoration needs.” (Havens et al. 2015). I also say that having a centralized system is much easier to manage than multiple privatized inventories.

The proposed OTSP closure is a game changer, with many unknowns. The FGCA and Forest Ontario’s grower and planting partners are very concerned. Where will the millions of stored seeds go? There is currently not enough expert seed banking capacity in Ontario and physical facilities must be built by September 2018. Where will next year’s seed crops be processed? The capacity to completely replace what the OTSP can do does not exist. Who will monitor seed quality and track seed source? Who will invest in the expertise needed to establish and maintain a long-term seed bank, a critical weapon to fight the impacts of climate change while government policy catches up? Is the private sector willing or able to take on these less profitable but important roles?

Environmental Commissioner Dianne Saxe recently reported that Ontario’s forests are under increasing

stress from climate change. Climate models show that southern Ontario’s trees, adapted to a warmer climate, will be the best genetic material for northern Ontario before the 22nd century. We are fortunate to have almost half of Canada’s tree species (79) in southern Ontario and they support great complexity in the biodiversity of many associated forest plants and animals. Tragically, many southern forests have been lost to agriculture and development; approximately six percent of forest cover remained in southern Ontario in 1920 and, despite many excellent planting programs, much of the



PHOTOGRAPH BY MELISSA SPEARING

Collecting white ash samples near Kirkfield, Ontario with Donnie McPhee, manager of the National Tree Seed Centre in Fredericton, New Brunswick in October 2017. The OTSP helped organize ash seed collections for several years ahead of the impact of emerald ash borer.



**Hemlock Cut Tests by OTSP Staff**  
Brown cones with aborted seed  
Green cones picked too early

Cut tests and collecting close to natural seed maturity are important for banking high-quality seed. OTSP staff have experience from many collection seasons to help collectors pick the best seed at the right time.

Carolinian Zone remains at this level or below it today. Protecting and increasing forest cover is an ongoing challenge. The remaining forests face many threats including introduced exotic plants, insects and diseases that often prevent native trees from regenerating successfully. A recent study

from the University of Toronto predicts that without intervention Toronto’s natural ravines could be over 60% non-native species by 2050, primarily Norway maple (*Acer platanoides*). Given these serious threats, seed management and banking capacity need to be increased, not stopped.

The MNRF’s shortsighted decision to abandon seed management and long-term seed banking will make it more difficult to ensure the resilience of Ontario’s forests under climate change. Forests Ontario, the Forest Gene Conservation Association and their partners are willing to provide the leadership needed to maintain seed conservation and climate change

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PHOTOGRAPH BY MELISSA SPEARING

# Unwelcome Visitors

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adaptation practices, but we need long-term support. Please take a few minutes to go out and hug your favourite tree and then come back and write your local Member of Parliament ([www.ontla.on.ca](http://www.ontla.on.ca)) urging the Ontario government to ensure public investment in seed planning



PHOTOGRAPH BY ONTARIO MINISTRY OF NATURAL RESOURCES

Looking down one aisle of the OTSP's -18°C (-4°F) long-term seed freezer, with collapsible shelving for efficient use of space.

and banking for future generations. Tell them that an effective plan for managing biodiversity must involve government, not-for-profit organizations and commercial interests. There is no future without forests and no forests without seed.

*Melissa Spearing is the Forest Gene Conservation Association's seed program coordinator, and the new editor of the Tree Seed Working Group News Bulletin for the Canadian Forest Genetics Association. She urges concerned citizens and growers to contact the FGCA to contribute to a new collaborative seed management system in development for Ontario. Visit the FGCA blog post at [fgca.net/save-ontarios-seed](http://fgca.net/save-ontarios-seed) to learn more.*

by *Flora Nadafi*

Why did I move from the big city (Toronto) to a rural township (Mulmur) and leave behind my engineering profession and the convenience of condo living? For an absolutely emotional reason: to start a container-grown native tree nursery in memory of my beloved son, Faraz, who was hit by a car while travelling in the United States in 2013.

I officially started my small nursery in the early spring of 2015 and planted seedlings of seven varieties of Ontario natives: white birch (*Betula papyrifera*), tamarack (*Larix laricina*), red pine (*Pinus resinosa*), white oak (*Quercus alba*), black walnut (*Juglans nigra*), red maple (*Acer rubrum*) and bur oak (*Quercus macrocarpa*) in containers in mid-April. I hand-watered them with rain water collected in a cistern and applied controlled release fertilizer. Soon, the seedlings started to grow and buds formed indicating that the leaves were about to unfurl.

Everything was going well. My baby trees were healthy with more small branches forming and fresh leaves opening every day. Until mid-May. That's when I noticed that the trees – with the exception of red pine and tamarack – had been attacked by insects. Several white birches had been stripped of their new leaves – not a pleasant sight. I knew that native plants were supposed to support local insects and pollinators... but to the point of decimation?

I had no clue what was happening and was terribly worried that my trees may not survive, given the speed at which they were losing their leaves. At the highest point of my distress, an inspired thought came to mind: "Maybe I can ask Dr. Douglas Tallamy for help." I had read his book, *Bringing Nature Home*, and was confident that he would know what was attacking my trees. I did wonder if the distinguished entomologist would have time to reply to my desperate

request, but decided to give it a shot. Late on a Saturday evening I sent my plea for help to his university email address. To my astonishment, on Monday at 8:31 a.m. I got a response. I was awed that Douglas Tallamy had been kind enough to read my message and reply so promptly. Here's what he



Sawfly larvae on a new leaf



Sawfly larvae in a group feeding



An example of how the leaves were destroyed

[HTTPS://WWW.PIXABAY.COM/EN/SAWFLIES-LARVAE-TRACK-LEAF-DAMAGE-2465806/](https://www.pixabay.com/en/sawflies-larvae-track-leaf-damage-2465806/)

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said: "Sounds like you're having a good year for sawflies. With container-grown plants I would just pick off the larvae when I see them. If that is too much work, spray with soapy water. Try not to use imidicloprid products because they are systemic and stay in the plants for years. Good luck."

I followed his advice. For the next month, I inspected the trees and their leaves in the morning and again in the afternoon and removed the larvae. By mid-June, the insects were gone.

I also did some online research. Sawflies are insects from the suborder Symphyta within the order Hymenoptera which includes ants, wasps and bees. The common name derives from the fact that the adult female uses her saw-like ovipositor to cut open the plant and lay her eggs. Sawflies go through a complete cycle of metamorphosis with four distinct life stages: egg, larva, pupa and adult. Adult sawflies are wasp-like insects that do not sting and do not attack plants. However, the larvae are plant feeders. They usually feed in groups and can defoliate a tree from the top down. They prefer the new leaves of young trees. Stressed trees are especially susceptible to damage.

Sawflies, which vary widely in appearance and size, and may be specific to certain plants, are found on all continents except Antarctica. There are some 10,000 species worldwide. In Canada, approximately 600 species of sawflies can be found just about anywhere, but especially in boreal regions. Certain species will do extensive damage to agricultural crops.



*A white birch that has recovered from the sawfly larvae attack*

Simple control measures are usually effective if the damage is detected early enough (that was my case). It is best to look for sawfly larvae in mid-spring by inspecting both upper and lower surfaces of the leaves. For light infestations, hand-picking the larvae and squishing them will effectively take care of them. Another safe and environmentally friendly way to dispose of them is to zap them with a high pressure stream of water, which

will result in killing many of the soft-bodied larvae. This needs to be repeated throughout the growing season.

Some birds and predatory insects may feed on larvae, but this does not guarantee that the plant will be saved. When a group of larvae is disturbed they all wiggle at once, which makes them look like one big threatening organism. This usually frightens away the predators. The larvae may also secrete some type of annoying liquid if disturbed, which drives predators away. This liquid can also be irritating to humans if it gets onto skin or into eyes.

Since I performed my sawfly removal procedures, I haven't had any more undesirable visitors, for two reasons. First, I was lucky to catch the unsightly invaders in the early stages of their invasion and, secondly, the trees were small and didn't have many branches and leaves so it was possible to inspect both sides of every single leaf twice a day. I'm grateful that my trees – including the new ones added over the past couple of years – are growing vigorously now. I hope yours are too!

*Flora Nadafi is the owner of ForFaraz – Container Grown Native Trees, [www.forfaraz.com](http://www.forfaraz.com).*

PHOTOGRAPH BY FLORA NADAFI



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**NANPS Online**

A dedicated team of volunteers has been busy creating the new NANPS website and it's beautiful! To renew your membership, browse our native plant database or stay informed about native plant-related issues, visit [nanps.org](http://nanps.org). We are also on Instagram now. (Please note that in order to use Instagram you must open an Instagram account.) Visit [instagram.com/nativeplant\\_society/](https://www.instagram.com/nativeplant_society/) to check out great photos of native plants and learn about upcoming NANPS events. Here at NANPS, social media options are growing just like our vigorous native plants!



*Rubus odoratus (purple-flowering raspberry)*

PHOTOGRAPH BY CONNIE MILLER

# Propagating Trailing Arbutus

by Peter Fuller

Creeping across the forest floor, trailing arbutus (*Epigaea repens*) draws little attention to itself but, like a quiet friend, it possesses a charm all its own once you get to know it. Native to all of Eastern North America, this creeping shrub is related to heaths and rhododendrons. Its evergreen foliage is tipped in very early spring with white or pink flowers that produce a spectacular fragrance. The provincial flower of Nova Scotia, it occupies a unique ecological niche in our woodlands as one of the first plants to provide nectar and pollen to insects each spring. I always enjoy coming across it in the woods and have experimented with propagating it in my native plant nursery so that I can pass the information on to home gardeners who want to try it.

Here in Eastern Ontario, I have found wild populations on the Canadian Shield in mixed pine woods on slopes with regular moisture but good drainage.

Its preferred soils are sandy and acidic with a layer of organic material formed from decomposing leaves and pine needles. Plants seem to flower more when given a few hours of sunlight and yet I've found sunburned patches (where the trees had been cleared) that continued to bloom. These conditions may seem specialized (and they are), but when trailing arbutus finds what it likes, it can

spread through a woodland. Plants grow a vigorous fibrous root system from a central crown and will develop feeder roots along the creeping stems, but the main roots are shallow and resent being disturbed from the moist organic layer of the forest floor. Digging and trying to transplant wild plants is a bad idea; establishing young plugs or using containers are much better ways to introduce *E. repens* into your garden.

For the last few years, I have kept a large pot in the unheated greenhouse, tucked away in a tote of dry leaves over winter. When I bring it out in mid-April, the flower buds are usually swelling and showing colour. I place the pot in the greenhouse work area. As my staff and I sow seeds and pot divisions we enjoy the sweet and complex fragrance from the clusters as they open. If the spring weather is cool, we can enjoy the fragrance for



Seedhead of trailing arbutus

PHOTOGRAPH BY PETER FULLER

Since I do not have moist, woodland conditions at the nursery, I grow trailing arbutus in containers filled with a peat-based medium and keep them in a shaded hoop house. The containers are buried in leaves for the winter. Older plants need to be moved to a larger pot once a year (usually), but have developed strong root systems that can handle summer dry spells.

two or three weeks.

As flowers fade, plants put on a spurt of vegetative growth and expand an inch or two in all directions from the many growing tips. Plants may shed some older leaves at this time. As with rhododendrons, many growing tips will have formed clusters of flower buds for next spring by the end of the summer. The plants remain green over the winter especially if covered with

leaves or snow, but make sure to remove the leaves in April.

If you wish to try trailing arbutus in your garden, I would recommend putting young plants in acidic soil (such as that preferred by rhododendrons) on a bit of a slope, in bright shade. Start with plants that are two or three years old and keep them regularly watered for the first couple of years. It's worth adding pine needle

in the spring, small, greenish, round fruits form and, as they ripen, they look like miniature white strawberries with a host of tiny, tan seeds embedded in the fruits. You can collect seeds at this time (late June or early July), but they are difficult to separate unless you dry the fruit for a few days and then crush or rub them to release the seeds. Or you can collect seeds over a few weeks as they dry on the

require an initial cool period and do best if surface sown on a damp medium such as milled sphagnum, peat or a peat/perlite blend. I sow seeds in pots, water them from below, place pots inside a plastic bag and keep them under lights for 16-hour days. If you don't sow seeds right away, they can be kept dry in plastic in the refrigerator and sown in fall or winter. I have even sown stored seeds 18 months after collecting them and still achieved good germination. Store them properly and they will retain their viability.

The young plants are slow to grow. I keep them for an entire year or more under lights, leaving the pot in the plastic bag with ventilation holes once germination begins. When plants have one or two true leaves (after a few months), I plant the vigorous seedlings individually in small pots or small clumps of seedlings together in one pot. I water with a weak fish emulsion solution every month or so. Don't ever let them dry out at this stage or they will quickly die. Moss can sometimes swamp the seedlings but it can be pulled out with tweezers from around developing plants. As early as 1948 (according to the *Woody Plant Seed Manual*, United States Department of Agriculture Forest Service) the importance of a mycorrhizal association for *Epigaea* was recognized, so I use a medium that includes mycorrhizal fungi.

Another possibility for propagation, if you have access to mature plants, is to take cuttings of new growth after it has matured, usually around the end of June or beginning of July. I cut five-centimetre (two-inch) tips of new growth with three to five leaves. I have sometimes dipped them in rooting hormone, but haven't kept track to see how much difference this makes. I stick about a dozen cuttings per 20-centimetre (eight-inch) pot on an angle (imitating the creeping stems) in potting mix, place the pot in a plastic bag to keep humidity high and put it

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PHOTOGRAPH BY PETER FULLER

*Trailing arbutus in bloom in the spring*

mulch.

Growing plants from seeds or cuttings may be even more rewarding for the home gardener. The flowers appear to be perfect (with male and female structures), but practically, the species is dioecious; flowers that produce pollen don't have receptive stigmas and flowers with developed stigmas have no anthers or only vestigial ones. If flowers are fertilized

plant. The possible drawback to this is that you may lose the fruit to wildlife if you wait too long. I have collected seed a bit on the green side (because I wouldn't be returning to the site) and also at the mature stage. Germination has been good both ways.

Fresh seed can be sown right away and will germinate in a few weeks. Like many species in the Ericaceae family, trailing arbutus seeds don't

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under fluorescent lights. Cuttings take a while to root and I have had variable success with them. Some have always rooted, so it continues to be worth my while to use this method because it is one to two years faster than seeding. By September, if the growing tip is still green and forming buds the cutting will likely take. Those that are brown will likely not root. I keep the whole pot of cuttings under lights in a cool room for the winter and pot the rooted ones individually in early spring. They can go outside for the summer (in the shade) and be planted in September. Or they can go in a protected spot for the winter and be planted out the following spring.

Propagating trailing arbutus from seed or by cuttings is not difficult but does take time and patience. The basic techniques can be employed for other species in the Ericaceae family such as sheep laurel (*Kalmia angustifolia*) or Labrador tea (*Ledum groenlandicum*). Using fluorescent lights makes the process easier. Don't hesitate to try these beautiful native plants in your garden.

*Peter Fuller is the owner of Fuller Native and Rare Plants in Belleville, Ontario. As a plant enthusiast and avid birder he enjoys exploring Eastern Ontario backcountry and volunteering at the Prince Edward Point Bird Observatory.*



*First year community seedling pot*



*Fall buds of trailing arbutus*

PHOTOGRAPHS BY PETER FULLER

# Lessons Learned in Saskatoon

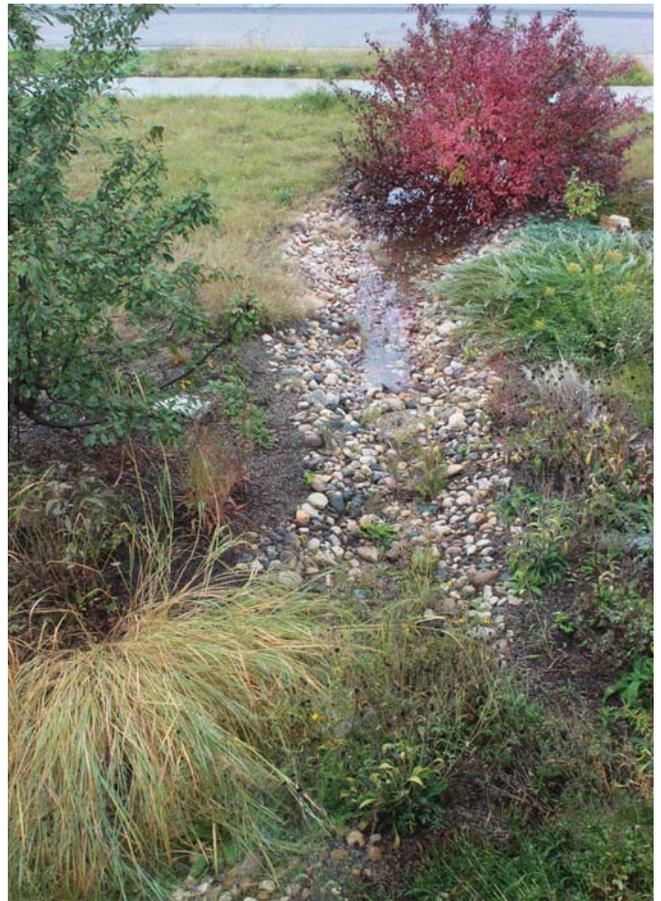
by Chet and Candace Neufeld

Looking out into our backyard in Saskatoon, Saskatchewan, we can't help but notice the difference between our yard and our neighbours'. Certainly, there's the obvious difference of floral diversity, since most of the yards around us are all conventional lawn with the occasional small flower bed. Spend a few minutes watching though, and something else becomes evident: our yard is alive. It hums and trills with numerous species of bees, birds, butterflies, beetles and other insects. We've had American robins, tree swallows and chipping sparrows nest in our yard, and dozens more stop and forage. The reason? Native plants.

In 2007, we decided to landscape our entire yard using indigenous species. Our yard was unfinished, leaving us with a clean slate and bare soil with which to create our design. The possibilities were endless and the amount of work threatened to be as well. But we were up for the challenge.

We trenched a dry creek bed into the front yard, which is fed by

downspouts. When it rains, the creek flows and pools at the end, where red osier dogwoods (*Cornus stolonifera*) soak up the water. We planted native flower beds to border part of the creek bed. The remaining front yard is planted as a lawn, but not a conventional one; we seeded blue grama (*Bouteloua gracilis*) and June grass (*Koeleria macrantha*). The backyard consists of a vegetable garden, a few raised native flower and shrub beds, a central native grass lawn, and a small bog garden filled with wetland plants and fed by the overflow from a rain barrel through an underground pipe.



PHOTOGRAPH BY C. NEUFELD

Front creek bed as it would be viewed standing in front of the house.



PHOTOGRAPH BY C. NEUFELD

Native lawn with creek bed in 2012

We also have a heavily shaded area along the side of our house where we planted native woodland species. We used a combination of native seed and plants to establish the yard and, aside from the area with woodland species, we planted the native flowers in groupings to fit in with the rest of the neighbourhood. Our landscape plan is consistent with permaculture principles, although that was not one of our primary goals. A lot of careful planning went into the design of our yard, with considerations for plant species and locations, wildlife and aesthetics.

## Ten Years Later: Successes, Challenges and Lessons Learned

A lot has changed, for better or worse, since we completed our yard. The

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plants became established quickly and grew 20-50% larger than the specimens we were used to seeing in the wild, especially during the first few years.

June grass is a bunch grass and blue grama has very short rhizomes, so our native grass lawn has small spaces

both as rhizomes and as seed blowing through the fence (we ensured our native seed mix and soil was free of weeds to avoid direct introduction). Anticipating this problem, we positioned our raised native flower beds and bog garden against fence lines to act as a buffer for the lawn,

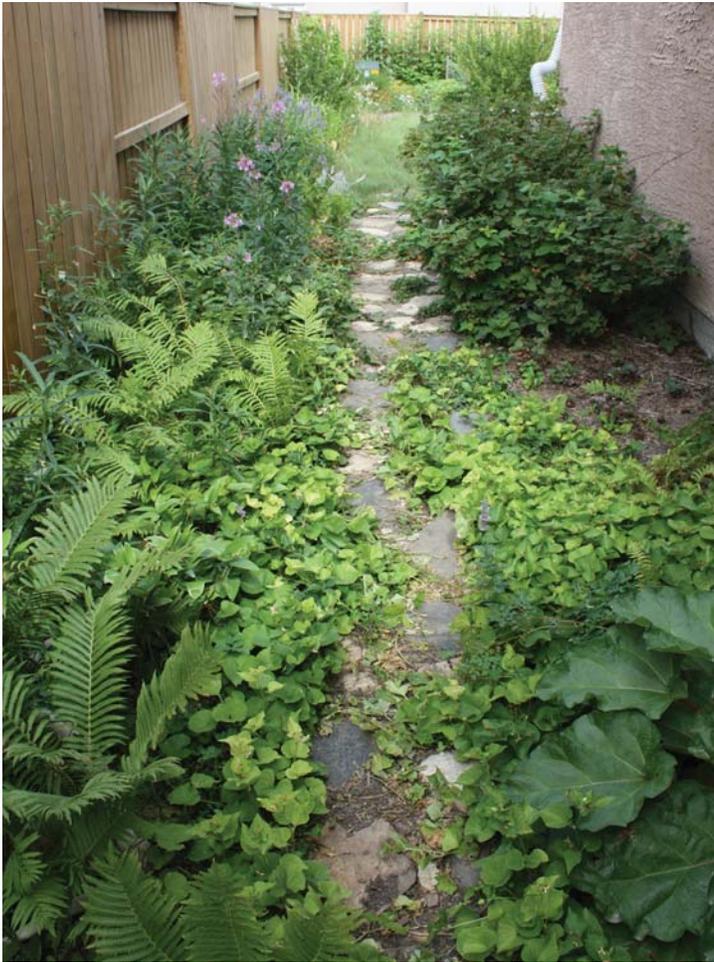
laid down landscape fabric and wood mulch on the flower beds, and installed 15-20 centimetre (6-8 inch) pound-in lawn edging where our fence came into direct contact with the grass in the neighbours' yards. However, grass rhizomes have grown underneath the landscape fabric and lawn edging for more than a metre in some places. The worst areas of grass invasion are where seed has blown in

and established. Due to the deep and extensive root systems and rhizomes, it is very difficult to separate the "bad" non-native grass from the "good" native grass and our neighbours probably wonder why we're always digging grass out of our lawn! Dandelions (*Taraxicum officinale*) and other weedy forbs are also problematic. We have remained herbicide-free, which makes control of these weed species more difficult.

Apart from the obvious health and environmental concerns of using herbicides, we want to avoid killing the native forbs and grasses that have established voluntarily in our lawn. We noticed goldfinches, dark-eyed juncos and other birds eating the weed seeds off the plants we hadn't gotten to so we felt a bit better about our weeds. The dandelions provide a season-long food source for pollinators.

It's not all hard work though. It's exciting to have new native species appearing in our lawn. Our intention with the native grass lawn was to mimic a traditional lawn by using short-growing native grasses and it is starting to look more like a native prairie. Western wheatgrass (*Pascopyrum smithii*), pussytoes (*Antennaria* sp.) and various native sedges (*Carex* spp.) have started to fill the spaces between the grasses. Wheatgrass adds contrast with its bluish leaves, as do the silvery mats of the pussytoes. An as-yet-unidentified native sedge is spreading by rhizomes, and has formed small, dense clones where even Kentucky bluegrass can't establish. We are actively collecting the seed from this sedge and planting it in other parts of the lawn. The blue grama planted in the street frontage has filled in much better than the rest of the yard. This is likely because our neighbour mows it frequently, triggering rhizome growth, whereas the rest of our "lawn" gets mowed once a year. We may start to mow the native grass areas more frequently (now that we are no longer collecting seed) to help them fill in, although this may be at the expense of the interspersed wildflowers.

Blue-eyed grass (*Sisyrinchium montanum*) has spread from the flower beds into the lawn with vigour and provides a burst of cheery blue flowers. Other native forbs like prairie coneflower (*Ratibida columnifera*), gaillardia (*Gaillardia aristata*), black-eyed Susan (*Rudbeckia hirta*), meadow blazing star (*Liatris ligulistylis*) and



PHOTOGRAPH BY C. NEUFELD

Forest walkway

between the plants that have yet to be filled in. In heavy snow years where the snow sticks around late into spring, we have had grass patches die off. We simply re-seeded. Weeds are our biggest problem and consist primarily of very aggressive perennial grass species such as Kentucky bluegrass (*Poa pratensis*), creeping red fescue (*Festuca rubra*) and perennial ryegrass (*Lolium perenne*). These have crept in from the neighbouring yards,

heart-leaved Alexanders (*Zizia aptera*) have also come in from adjacent flower beds. Some of these species spread prolifically by seed so we occasionally have to thin them out of the lawn and the flower beds. Philadelphia fleabane (*Erigeron philadelphicus*), tufted white prairie-aster (*Symphyotrichum ericoides*), little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), wild mint (*Mentha arvensis*) and a few provincially rare plants like yellow evening primrose (*Oenothera flava*) and northern blue-eyed grass (*Sisyrinchium septentrionale*) have appeared on their own in recent years.

The creek bed is becoming more work as Kentucky bluegrass threatens to establish among the cobblestone sides, despite the lack of soil and the addition of landscape fabric underneath. The pea gravel bottom of the creek bed has proven to be a good growing medium for native flower seed from adjacent beds. We try to transplant larger forbs that might obscure the creek, but usually leave a scattering of smaller plants like lance-leaved stonecrop (*Sedum lanceolatum*) to dot the cobblestone niches. Indian grass (*Sorghastrum nutans*) and switchgrass (*Panicum virgatum*) serve as beautiful specimen grasses adjacent to the creek bed.

The flower beds have done well. We have healthy stands of wild bergamot (*Monarda fistulosa*), dotted blazing star (*Liatris punctata*), crocus (*Anemone patens*), purple prairie-clover (*Dalea purpurea*), blacksamson echinacea (*Echinacea angustifolia*), silvery lupine (*Lupinus argenteus*) and many others. We have also managed to grow a yucca (*Yucca glauca*) from seed and there are three small ramets next to the original plant, despite ants trying to take it out with their huge anthill. We struggle to maintain smooth blue beardtongue (*Penstemon nitidus*) and scarlet globemallow (*Sphaeralcea coccinea*); the soil may be too rich and moist for their liking. We tried growing the annual yellow

monkeyflower (*Erythranthe guttata*). It popped up in a few places then disappeared. The Saskatoons (*Amelanchier alnifolia*) and western sandcherries (*Prunus besseyi*) are quite large and have to be pruned back, along with the non-native fruit bushes in our flower beds.

Our favourite areas are the woodland and bog garden. The

and took a while to establish as their roots searched for a host plant, likely the bearberry (*Arctostaphylos uva-ursi*) planted next to them. The woodland plantings have coexisted without issue, probably because the species are equally competitive and adapted to the shade.

The bright yellow marsh marigold (*Caltha palustris*), blue flag iris (*Iris*



Bog garden

woodland area was planted to western Canada violet (*Viola canadensis*), downy yellow violet (*V. pubescens*), tall lungwort (*Mertensia paniculata*), twinflower (*Linnaea borealis*), veiny meadow-rue (*Thalictrum venulosum*), fringed loosestrife (*Lysimachia ciliata*), wild columbine (*Aquilegia canadensis*), star-flowered Solomon's-seal (*Smilacina stellata*), and others. Fireweed (*Chamerion angustifolium*) established on its own and is frequently pulled to manage its numbers.

We experimented with red Indian paintbrush (*Castilleja miniata*) and stiff yellow Indian paintbrush (*Castilleja lutescens*) in the woodland. Both paintbrushes are hemi-parasitic

*versicolor*) and shooting star (*Dodecatheon pulchellum*) in the bog garden have filled in the available space, but not spread much. This year we may try taller plants like spotted Joe Pye weed (*Eutrochium maculatum*).

### Why did we do it?

Many reasons. We wanted to practise what we preach. We are both grassland ecologists and passionate about native prairie conservation, so it makes sense that we would promote the use of native plants in landscaping. The second reason was environmental. We wanted to eliminate the need to water, fertilize, mow or use pesticides

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PHOTOGRAPH BY C. NEUFELD

*Purple prairie clover (Dalea purpurea) requires full sun and is very drought-tolerant, making it a great option for low-maintenance gardens, including rock gardens. It blooms in late summer and attracts a variety of pollinators. It is also a nutritious forage source for wildlife and livestock.*

in our yard. Due to the ongoing need to manage invasive species, our yard is by no means maintenance-free, but we rarely water (except the forest and bog during really hot, dry periods) or mow. If only prescribed burns were allowed in yards! Thirdly, we wanted to increase biodiversity by creating our own little “prairie” ecosystem in a city full of sterile monoculture lawns. Over 110 different native plant species have appeared in our yard over the past 10 years; some have disappeared and new ones are still appearing.

We love to see and hear the many fascinating species of birds, butterflies, moths, bees, wasps, beetles, dragonflies, damselflies, spiders, grasshoppers and ants that have made their home here or popped in for a snack. Spiders spin their webs and ants

build hills and mounds in our grass and flower beds. For most people this would be a nightmare, but for us it is really neat to see our little ecosystem at work providing a refuge for these species year-round. We suspect that some, especially the larger mammals such as muskrat and northern pocket gopher, are just dropping in for a visit, but they too are welcome.

Lastly, we love the look of a native prairie. We feel there is no way to “restore” a native prairie that evolved over 10,000 years and made a home for hundreds of species, particularly in the confines of a small urban yard, but we are proud to have something unique in our neighbourhood. And we haven’t had any official complaints!

### Recommendations for native plant novices

- Plan for the worst and hope for the best.
- Start small and work in manageable amounts.
- Think like an ecosystem and manage your yard accordingly. Trying to force things will almost always end up being more work and may be unsuccessful. It’s best to identify what’s working and encourage these trends.
- No matter how nice your neighbours are, assume their yards are enemy territory and will invade your fragile habitat if given the chance.
- If something works, repeat it elsewhere in your yard. If it doesn’t work, change it.
- If you want a native lawn and your yard borders an area with an invasive grass, either plant an isolated patch of native grass with a large buffer area, or install a deep, permanent barrier around your yard such as a concrete retaining wall sunk about two-thirds of a metre (two feet) deep! Using aggressive native grasses will help, but may affect the plant community in your own yard. We have seen buffalograss (*Bouteloua*

*dactyloides*) lawns which were quite dense due to the clonal nature of this grass, but walking on the pokey female burs couldn’t be fun. Blue grama and June grass will not make a sod-type lawn no matter how thickly they are seeded, so it is best to include at least one other native grass or sedge species (preferably with rhizomes) that will fill in the spaces.

- Finally, take time to enjoy what you and Mother Nature have created.

*Chet is the executive director of the Native Plant Society of Saskatchewan (NPSS). Candace is a grassland ecologist for the Canadian Wildlife Service, Environment and Climate Change Canada. This article is modified from the version that originally appeared in the NPSS newsletter.*



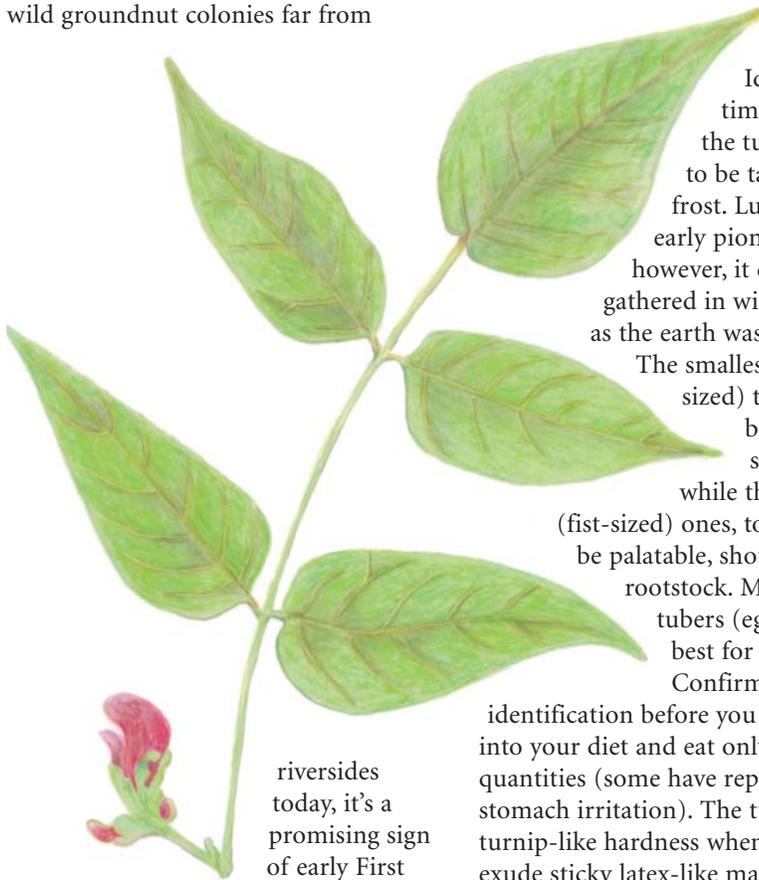
PHOTOGRAPH BY C. NEUFELD

*Smooth blue beardtongue (Penstemon nitidus) is an early bloomer that provides much-needed spring nectar to hungry native bees who have overwintered. It is also extremely drought tolerant and has a noticeably waxy feel to its leaves.*

desired support. It spreads by seed or reproduces by tubers and is frequently distributed by river flooding. It's interesting to note that if you find wild groundnut colonies far from

fried, baked or mashed. The tuber is highly nutritious, rich in calcium and iron, with reported 17% protein content, three times

ILLUSTRATION BY ANGELIQUE MORI



riversides today, it's a promising sign of early First Peoples' habitation, as it was often cultivated near their settlements.

Groundnut is pollinated primarily by bees; leaf-cutter bees are the chief cross-pollinators. It's a preferred host plant of the silver-spotted skipper butterfly and its foliage is also browsed by white-tailed deer. Rabbits, woodchucks, skunks and wild hogs relish the tubers. The lush growth acts as a refuge for small mammals.

Regrettably, groundnut's acceptance as a mainstream agricultural crop is unlikely as it takes two years for tubers to mature. Given this lengthy maturation time, it will likely remain a novelty food. Nonetheless, the flowers are good raw or cooked, the seeds have a flavour similar to domestic peas and the beans are tasty. Most prized are the tubers. They are easy to clean and cook, delicious in soups and stews or

that of potatoes.

Ideal harvest time is autumn; the tubers are said to be tastier after a frost. Luckily for early pioneers,

however, it could also be gathered in winter as long as the earth was not frozen.

The smallest (grape-sized) tubers should be reserved as seed stock, while the larger (fist-sized) ones, too woody to be palatable, should be left as rootstock. Medium tubers (egg-sized) are best for eating.

Confirm the identification before you introduce it into your diet and eat only modest quantities (some have reported mild stomach irritation). The tubers have a turnip-like hardness when peeled and exude sticky latex-like material. I prepared a delicious snack of pre-boiled, butter-fried medallions that were satisfyingly chewy and crunchy with a mild nutty flavour.

Early missionaries referred to groundnut as "rosary vine" for the swollen bulbs dotting its creeping rhizomatous roots. In 1874, celebrated American botanist Asa Gray claimed that, had civilization arisen in America rather than abroad, "our Ground Nut would have been the first developed esculent tuber and would probably

have held its place in the first rank along with potatoes and sweet potatoes." The essayist-philosopher Thoreau wrote less enthusiastically of groundnut: "In case of famine, I should soon resort to these roots."

Some say the vine is too aggressive for the home garden, but my own patch has been well behaved. If its roving ways are a concern, you can contain it in a raised bed or provide an out-of-the-way site to ramble. If you're more adventurous, you can forage for it in moist thickets where skunk cabbage (*Symplocarpus foetidus*) flourishes in dark, damp soil. Wild harvesting, however, can be challenging as chains of tubers frequently grow through, around, under and between neighbouring woody roots. A final caveat: be mindful of poison ivy (*Toxicodendron radicans*) as it frequently grows nearby!

Groundnut must be the most underappreciated, unrecognized, under-utilized vine in North America, but it's well worth getting to know.

*Angelique Mori lives in Hamilton, Ontario where she delights in "wild" foraging in her habitat garden.*

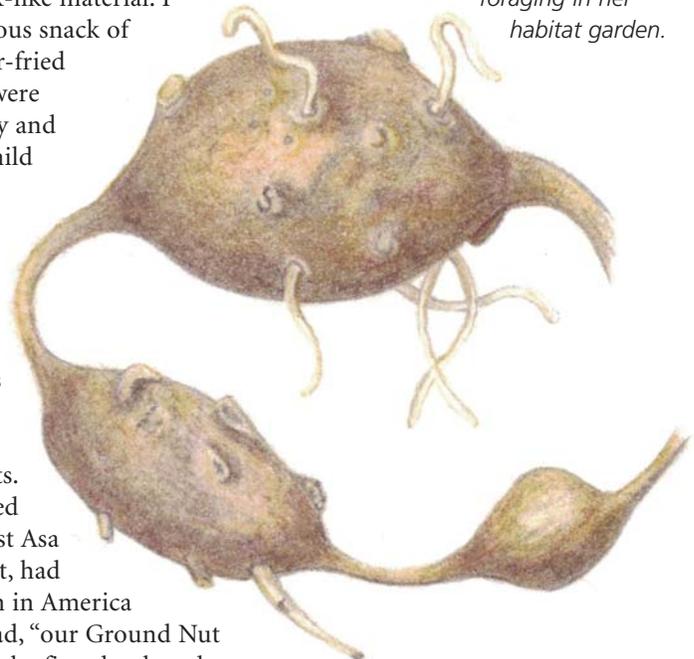


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