

Message from the President

Stephen Heard

It's hard to believe it's already midsummer – but a walk through your Botanic Garden will quickly persuade you. You'll find a riot of colour, some new plantings, and our staff and volunteers busily tending what we've sowed.

Let me mention a couple of recent highlights. We have two new public art installations: *Pandemic Gardens* (near the Pollinator Garden) and *Ferns and Fiddleheads* by Jean Hudson (near the Daylily Garden).

The Food Forest has had a major expansion. The Wabanaki Healing Garden has had its official opening and is filling in luxuriantly. And finally: it may never be a treasured part of your visit, but our



maintenance area is expanding to house our new side-by-side vehicle. It takes a lot of work to keep your Garden growing, and maintenance and horticultural infrastructure is very important to us.

There's much more going on, of course, and one of the most important things to us is that you're coming to see it all. So please visit often – and bring your friends, and convince them to join you in membership. The more of us there are, the more Garden we can all have!

Summer Garden Tours

What's in Bloom? Tour

Wednesdays 10am through August 23, begin at the greenhouses, 10 Cameron Court

Come check out the new blooms with a guided walkthrough of our flowering beds!

Woodland Trail Tour

Fridays 10am through August 25, begin at the 695 Prospect Street parking lot

Join us for a guided walkthrough of our beautiful garden trails with a little bit of local history.



Sunday Garden Tours

These tours are free to Botanic Garden members and \$5/person for non-members.

August 7, 2 pm

New Brunswick Literature Garden with Steve Heard

August 14, 2 pm

Pollinator Garden with Amy Parachnowitsch and Yedra García



Children’s Summer Garden Activities

All activities start at the Discovery Shed in the Fredericton Botanic Gardens—10 Cameron Court

Garden Explorers

Mondays 2pm

Come explore the gardens with a fun activity and a craft. For caregivers and children ages 5-11.

Stories in the Garden

Thursdays 10am

Join us in the garden for stories followed by a garden-themed activity. For caregivers and children ages 3-6



If you would like to schedule a tour or program for your youth organization at the Fredericton Botanic Garden, contact Kat at fbgahorticulture@gmail.com to arrange a program now through September 2nd.



Science in the Garden

Steven Heard (Professor, Biology, UNB)

I walked by our Xeric Garden the other day (look for a small pebbly garden around the display kiosk near the Resource Centre), and the succulents – stonecrops and hens-and-chicks among others – were putting on a show. And that reminded me about how for an embarrassingly long time, I misunderstood why succulents are succulent. It isn’t why I always thought; it’s much, much more interesting than that.



Photo: Stonecrop (*Sedum* sp.) and Hens-and-Chicks (*Sempervivum* sp.) in the Xeric Garden. © Stephen Heard CC BY 4.0.

“Xeric” means, more or less, “dry” or “desertlike”, and you’re used to picturing succulent plants in the desert: cacti, most famously, and agaves, and many more. These plants have thick, fleshy stems or leaves that hold a lot of water. For many, many years I thought these plants were storing water as a reservoir to draw on – like the canteen I take hiking. But that’s not it at all. Instead, their succulence connects to an amazing quirk in their biochemistry. Let me explain.

Nearly all plants are photosynthetic: they get energy from the sun, by synthesizing sugars from water and carbon dioxide. That reaction is fuelled by sunlight; but in hot, dry conditions, it’s prob-



lematic. The carbon dioxide that's needed as a raw material has to come from the atmosphere, so plants open tiny pores in their leaves, called "stomates", to let carbon dioxide in. But opening the stomates to let carbon dioxide in also, necessarily, lets water out – and in the desert, you can't afford that. So what's a plant to do?

Our succulents have evolved an amazing trick to overcome this problem. During the hot, dry day they close their stomates up tight to conserve water. To pick up carbon dioxide, they open them when it's cooler and moister at night. But they can't actually photosynthesize – build that carbon dioxide into sugars – at night, because there's no sunlight. Instead, they store it, and that's what the succulence is for. Succulent plants are succulent because they have large water-filled "vacuoles" in their cells; and that water is there as a place to store carbon dioxide from night into day.

But it gets even better. You see, carbon dioxide isn't all that soluble in water (if it was, your soft drinks wouldn't be fizzy). So plants bind the carbon dioxide into a small molecule called malic acid, which *is* water soluble. Then in the morning they break down the malic acid again to release the carbon dioxide, and the usual (and quite complicated!) biochemistry can take over to combine it with water and light to make sugars. That intermediate step – taking carbon dioxide, converting it to malic acid for storage, then breaking down the malic acid to release it again – takes energy, so cool/moist climate plants don't do it. But in a desert, where water conservation is imperative, it's a price worth paying.

All the biochemical machinery that stores and releases carbon dioxide is called "crassulacean acid metabolism", or "CAM". It's named after the plant family Crassulaceae, in which it was first

discovered. And guess which plants belong to the Crassulaceae? Among others, the stonecrops and hens-and-chicks that inspired this article.

If CAM sounds pretty complicated, well, it is. What's especially amazing is that it hasn't evolved just once. Not even a couple of times – instead, it's evolved many dozens of times over in different groups of plants. Stonecrops do it, yes; but so do cacti. Some desert geraniums do it, and agaves, and pineapples, and even the snakeplant (or mother-in-law's-tongue) that might be squatting dustily in a corner of your living room. We call the independent evolution of similar adaptations by distantly related organisms *convergent evolution*, and it's a testament to the power of natural selection that is all around us.

So the succulents in our xeric garden aren't just pretty plants. They're a window on what evolution can do, with millions of years to work with. When I learned about CAM (in second-year university Botany), my mind was blown. It hasn't unblown since.

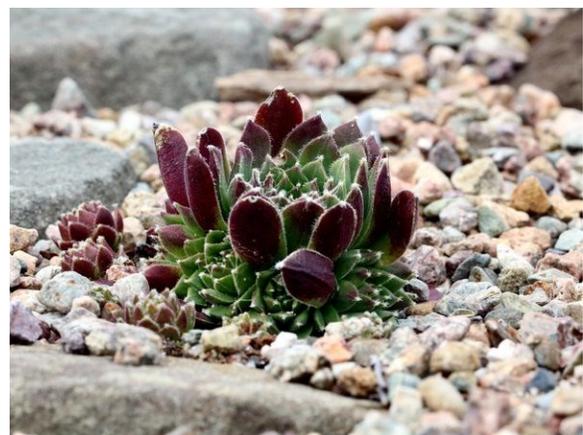


Photo: Leslie Finch.



FBGA Membership

A Garden membership provides ongoing support to the maintenance of the Fredericton Botanic Garden.

- Individual \$30/year
- Senior/Student \$25/year
- Family \$45/year

In addition to free admission to most FBGA events and access to our Lending Library, members receive a 10% discount in the Garden Gift Shop, and a 10% discount at the following local garden centers:

- Co-Op Country Store (Northside)
- Corn Hill Nurseries
- Curries Greenhouses
- Kent Garden Center
- Scott's Nursery
- Wetmore's Nursery

Join or renew online at frederictonbotanicgarden.com/membership Paper forms are also available from the link above and at the Resource Centre.

Gift memberships are also available.



Fall Bulb Sale

Stay tuned for details on our first Fall Bulb Sale in late September. Silk Road Tulip pictured.

How You Can Support the Garden

After 30 years, the Botanic Garden remains a work in progress. This 53-acre community gem depends on volunteers for its development and maintenance in partnership with the City of Fredericton.

There are various ways as a member that you can support our beautiful Botanic Garden to continue to thrive and grow:

- ◇ Visit the Garden often throughout the year (even in winter) to become familiar with and appreciate the changing flora throughout the seasons;
- ◇ Renew your membership when it is due;
- ◇ Invite your friends and neighbours to become members, to visit and to support the Garden;
- ◇ Remain informed about activities through the newsletter, social media and e-mails;
- ◇ Participate in the Talks in the Garden, tours held within the Garden, and other special events such as the opening of new garden beds;
- ◇ Volunteer to serve on the Board of Directors or on a committee;
- ◇ Contribute financially through donations, endowment, and receive tax deductible receipts;
- ◇ Solicit support for projects from private corporations and community organizations;
- ◇ Support government financial assistance requests.

Membership numbers are an important consideration when corporations are looking to provide funding for a project. The Membership and Volunteer Committee is therefore striving to substantially increase the active numbers of members.

Thank you for your support,

The Membership Committee



Getting to Know Your Board Members: Louis Philippe Albert

By Tess Madigan

Louis Philippe Albert grew up in Saint-François de Madawaska, as the 4th born of 12 children. His father was a well-respected farmer whose innovations, visions and contributions at the time made him a natural leader in the field of agriculture. In 'those days, before the advent of heavy equipment and the mechanization of processes, production on the family farm varied depending upon the number of offspring available to help out any given time. Work included labour in dairy, sheep, strawberries, beef, vegetables, etc.

It was only in 1945 after the war that the family acquired its first gas-powered farm asset - an army truck. Louis-Philippe's favourite chore was driving the tractors and trucks (often too fast!). And his least favourite chore? Weeding rows upon rows of vegetables the family grew on contract with a nearby canning facility. He was relieved when the weeding geese were added. In the 1950's, his father worked part-time off the farm to support the secondary education of *all* twelve of his children.

Louis Philippe, the only one to follow his father's path, would forge a career combining his passions - agrology, business and organisations. After earning a degree in agriculture from the Université Laval and both a master's degree and PhD studies from Michigan State University, he and his wife, Cécile, along with their 4 children settled in Fredericton in 1971. He continued to lead a very gratifying career as an agrologist for the province and, later in the 80s and 90s, with the federal government.

From the 1980s until 2019, Louis-Philippe co-owned CELO Enterprises Ltd., a company that produced farm and woodland products. Activi-

ties outside of his civil servant career included growing raspberries, blackberries, Christmas trees and a large garden on the family farm and woodlot in Kingsclear. After retiring from the public service in 1995, he also provided consulting services to businesses and organisations.



Louis-Philippe was elected as President of the FBGA from 2001-2003 and joined the Board of Directors again in 2019, this time serving as Secretary. In the early 2000s, with his participation, the Garden launched a successful fundraising campaign where, much like today, the benevolent donors were local citizens and small businesses. He firmly believes that once a committed partner from industry steps forward and leads a team of business canvassers, the Garden's endowment funds will gain the financial boost needed for the garden to reach its full potential.

When he is not volunteering, listening to music, gardening or travelling, Louis-Philippe reads. He has an insatiable thirst for reading and his passionate depiction of his current pick, *Values-Building a Better World for us All* by Mark Carney made me add it to my summer reading list.

In June of this year, he was awarded the Order of Canada in recognition for both his advocacy of French-language community services and within the agriculture industry. Félicitations!



Food Forest Update

By Sima Usvyatsov

The food forest project has seen a flurry of work and progress in the last few weeks. The project received funding through the Community Food Action (CFA) grant, provided through Public Health NB, and through the Fredericton North and Fredericton Sunrise Rotary Clubs. In addition to this funding, the project was also supported by CFB Gagetown, Bird Stairs, and of course the multiple volunteers that came to do the planting and mulching.



Work on this site started several years ago, when Jim Goltz, with the FBGA, planted multiple apple trees, Asian pears, black plums, and sour cherries (many of the trees were donated by Joe Ruggeri and Steve Stehouwer). Then, in 2021, following the CFA grant, paths were installed at the site, and a fall planting of chestnuts, hazelnuts, and hickories was undertaken by a volunteer crew.

The FBGA then engaged with CFB Gagetown, to request assistance with earthworks required to remedy the drainage issues at the site. This year, a very wet spring prevented an early start of the drainage work, but in late June, a great crew from 4 Engineer Support Regiment, Canadian Armed Forces, 5th Canadian Division, Base Gagetown, installed drainage and berms, and dug holes for treeplanting at the food forest site. Their work was a huge help in improving drainage issues at the site, as well as preparing planting spots for dozens of fruit trees and berry bushes.

The crew included Lt Rice, Master Corporal Taylor, Corporal Fleming, Corporal Carr, Corporal Yhard, Corporal Colpitts, Corporal Perry, and Corporal Mahoney.

These guys did an awesome job despite the heat, rain, and soaked ground, and not only did they do all the requested work, but they also repaired the paths which took a beating due to the wet weather during the work.



A big thank you is also due to Bird Stairs in Fredericton, who provided the materials for this work at a discount, to support this project; being a non-



profit organization; we always appreciate the support from local business.

Once the drainage work was completed, over 100 fruit trees and berry bushes were planted in mid-July by crews of volunteers and FBGA staff and Board members, from the familiar raspberries, blueberries, and cherries, to currants, goji berries, spicebush, and saskatoons.

Weeding Wednesdays

May 4 — September 28, 6-8 p.m.

A weekly opportunity to garden with a group of fellow gardening enthusiasts. Weeding, planting and invasive species removal are among the many projects that happen Wednesday evenings, rain or shine. Wear long sleeves and bring your own gloves. Meet outside the greenhouses at 10 Cameron Court.



If you are interested in volunteering, but are not available Wednesday nights, contact Andrea at fredbotanicgarden@gmail.com to make arrangements.



In addition to the main planting event, a second planting day followed, where volunteers and FBGA staff mulched all the trees and underplanted them with herbs, nitrogen fixers, edible flowers, and beneficial plants. The Fredericton North and Fredericton Sunrise Rotary Clubs, which provided funding for the project, also showed great volunteer support during the two planting days. In addition to all the wonderful volunteers and very supportive FBGA staff and Board members, Andrew Mathis (Oasis Farmery) provided support for the project throughout the design, drainage work, and planting, with much-appreciated inputs, comments, and plain hard work. This project is the result of many helping hands, and we're excited to see it grow.



Holiday Plant Sale

Poinsettias and cyclamen will be available again through the Botanic Garden. Sales will open September 21 for pick up November 22-23.



Artists in Residence

Watch for Artists in Residence Peggy Holt (August 8-19) and Allison Veino (August 22—September 2) in the Garden in August. Many thanks to Todd Fraser, Nick Walsh, and Ysabelle Vautour for their residencies earlier this summer.



Check Out Our Seed Mailbox!



Located beside the Pollinator Garden, make sure to stop and pick up a seed packet on your next garden visit! We update it regularly.

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The Fredericton Botanic Garden Association Newsletter is published by the Fredericton Botanic Garden Association, Inc. The FBGA is a registered charitable organization. The objectives of the FBGA are to guide the establishment of the Fredericton Botanic Garden and to foster an awareness and appreciation of plants. For information on membership and to become involved, please contact us:

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Main Parking Lot: 695 Prospect Street

