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SONG NEWS

The Newsletter of the Society of Ontario Nut Growers and
The Eastern Chapter of the Society of Ontario Nut Growers

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The **SONGNEWS** is published 3 - 4 times per year by: SONG/ECSONG.
Send submissions to the editor:
Bruce w. Thurston
RR # 2 Branchton, ON N0B 1L0
or b.thurston@silomail.com
or nut.trees@grimonut.com

Inside This Issue

Library Corner - Gordon Wilkinson
This part of the page is now open to members who would like reference information or articles written by NNGA or SONG/ECSONG members. Gordon has a nearly complete set of NNGA Annual Reports and a complete set of SONG News issues to research.

NUTS ABOUT HEARTNUT COOKING
This unique cookbook is the only book dedicated solely to the heartnut. The book is priced at $12. Please add $3.50 for mailing. For special quantity price, contact: Gordon Chinnick, Treasurer, 722 6th Concession Rd, Walsingham, ON N0E 1X0

SONG/ECSONG Archive
Have you visited ECSONG? Click the tab at the bottom of the SONG website to see the work that was done there? If you click on the SONGNEWS tab, you will be impressed to find all SONGNEWS issues from the beginning of SONG in 1972. Enthusiastic members of ECSONG did this for all members and visitors alike. There is plenty of reading there for the new as well as old members. Enjoy!

SONG Website: www.songonline.ca
Be sure to check it for updates on meetings, read about nut farming, post your nuts, or nut products to sell online.
Send your free posting to: Linda Grimo, President,
979 Lakeshore Rd, RR3, Niagara/Lake, ON L0S 1J0
or: nut.trees@grimonut.com

Have you renewed for 2023? Check your envelope for the year that you are paid up.
On your mailing label, "(exp: 20xx)" means your membership expires end of year 20xx.

Coming Events

ECSONG Tour of Remnant Populations of Native Swamp White Oaks and the Oak Valley Pioneer Park

FREE: All are welcome.
WHEN: Sunday, September 17, 2023 from 1:00 pm to 5:00 pm.
WHERE: 12216 Cass Bridge Road, which runs west of Highway 31 (Bank Street), south of Winchester.
WHAT: A guided caravan tour of several sites with remnant populations of native swamp white oak starting with an impressive isolated specimen at 12216 Cass Bridge Road. After our visit to the various native swamp white oak sites our caravan tour will continue with a guided walking tour of the nearby Oak Valley Pioneer Park, located at 3324 Baldwin Road, which is west of Winchester Springs. It has a large collection of nut trees including oak, nut pines, hickory, ginkgo and butternut.

Our guides will be Owen Clarkin, a tree and shrub specialist, and Lester McInnis of the Volunteers of Oak Valley Pioneer Park.

FALL SONG Meeting - Joint meeting with the Ontario Hazelnut Assoc.

FREE: All are Welcome :)
When: Saturday September 23 from 1-4 pm
Where: Farm of Tony Rodrigues - 79989 Bluewater Hwy, Goderich Ontario
What: We are excited to announce the joint Society of Ontario Nut Grower and OHA fall tour for September 23 at the farm of Tony Rodrigues in Goderich. We have an excellent program lined up to show you his hazelnut orchard, chestnuts, heartnuts and other nut trees on his property.

Tony has a beautiful farm and he welcomes us for the afternoon.

Speakers will include:

- **Sophie Krolikowski,** OMAFRA - nut crops and post-harvest management,
- **Linda Grimo**, SONG President - updates on research on tree nuts in Canada and the USA
- **Jonathan Parkes**, University of Guelph - research and updates
- **Amanda Pilot**, OHA Admin and Hazel Grower - EFB and how to manage

ECSONG winter meeting

When: Saturday January 20, 2024
Where: Kathy Ablett Room, Hunt Club-Riverside Park Community Centre, 3320 Paul Anka Dr, Ottawa.
What: All things related to nut growing.

Ontario's Butternut Recovery Program Summary

by Linda Grimo

Ian Cochrane is the Forestry Program Manager at the Rideau Valley Conservation Authority. He gave a presentation on the program at ECSONG's Annual Winter Meeting in January 2023.

The Butternut is a native tree that grows through southern Ontario, into southern Quebec and into New Brunswick as well throughout the central and eastern United States. The Butternut is an important pioneer species producing nuts almost every year. The nuts were used by humans as a food source, natural medicine, and woodworking.

Butternuts across its range are now affected by the Butternut Canker Disease, a fungal disease that attacks the inner bark of the trees causing a lack of sap and water flow up the stem of the tree. This causes a loss of vigor, crown dieback and eventually girdling of the entire tree. There is no known cure for the disease. Butternuts are classified as an endangered species and protected on all federal land under the Species at Risk Act (SARA) and on all public and private lands in Ontario under the Endangered Species Act (ESA 2007).

The Butternut recovery program consists of identifying and assessing healthy Butternut trees for seed trees, testing DNA to prevent collecting hybrid seeds, collecting seeds, and growing them with our nursery partners. We hand out butternut seedlings to interested landowners for planting in the spring. We also collect survival information to see how well they do in the field. We work with other organizations to help improve our understanding of butternuts.

As of 2022, the program has handed out a total of 27,430 seedlings and collected 134,442 seeds since 2006. We have a database with 404 seed source trees in Eastern Ontario. Trees have been planted mostly in Ontario with a small amount being planted in Quebec. The results of our butternut recovery program are encouraging with just under 50% surviving into the fifth year.

Presidents Message

by Linda Grimo

In 1972 the Society of Ontario Nut Growers was formed by a passionate group who wanted to collaborate and share information regarding edible nut crops that could grow in Ontario. That same passion exists today, and I am fortunate to encounter these incredible people at different SONG and ECSONG meetings that I attend.

In order for SONG and ECSONG to grow, and continue to thrive, we need to reach others who are interested in nut trees and minor fruit trees that grow in Ontario. How do we attract them to attend meetings and to join SONG and ECSONG? Are they involved in commercial growing, permaculture, backyard food forests, reforestation, culinary using local nuts, live edge wood crafters?

I challenge you to share your SONGNews with someone who will enjoy reading it. If you receive a digital copy, please print it to share with them. Encourage them to attend our meetings, join in the comradery, or follow us on Facebook.

Please share your ideas for our organization with our boards. Do you want to see a competition for the best cracking hickory, hardiest Persian walnut or largest pecan? Do you want us to find a way to share a favourite recipe? Do you want us to get a booth at farm shows or gardening shows- which ones? What would you like to learn about at a meeting, or read in our Newsletter?

We need you and your ideas to help us grow! Thank you!

To share ideas or to ask questions we can be reached at:

Linda, SONG – song.president@yahoo.com
Gordon, ECSONG - gwilkinson001@gmail.com

Featured Grower: Gordon Wilkinson

Heartnut Performance at Two Very Different Canadian Sites

I have planted grafted and seedling heartnut trees at two very different sites in Canada - for 21 years at the first site and 11 years at the second site. This article highlights how differences in winter temperatures, precipitation, length of the frost-free season, soil depth and texture, disease pressure, nitrogen fixation, and tree damage and nut predation by wildlife have likely contributed to differences in tree performance between the two sites.

Locations, Orchard Sizes and Heartnut Varieties

One site, over 30 acres, is located just outside the village of Clarence, about 19 miles east from my home in the east end of Ottawa, Ontario, Canada. The second site is almost 2 acres and is located about nine hundred miles away by car in a tiny community in Nova Scotia called Seaforth. This orchard is about 2,000 feet from the Atlantic Ocean and 25 miles by car from the City of Halifax **(fig. 1).** For this article, I will call the first orchard "Ottawa" and the second orchard "Seaforth".

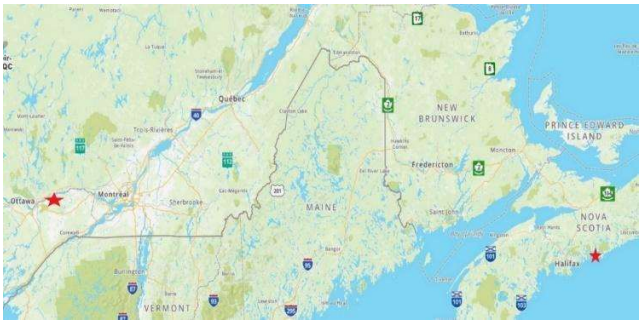

Figure 1: **Location of heartnut sites near Ottawa, Ontario and Seaforth, Nova Scotia (Halifax).**

The Ottawa orchard consists of close to 90 heartnut trees of which approximately two-thirds are of seedling origin. At the time of establishment, I was concerned that grafts would be more sensitive to severe winter temperatures than seedlings, so I started with seedlings. In addition, graft failures caused by insufficient watering, early fall or late spring frosts were allowed to sprout from the heartnut rootstock. The Ottawa orchard is located in USDA Plant Hardiness Zone 4a, defined as having extreme minimum temperatures averaging from -30 to -25 ºF. The oldest heartnut trees are over 12 years old.

The Seaforth orchard has 49 trees, all grafted except two where the grafts failed. All trees are either 10 or 11 years old. This site is in USDA Plant Hardiness Zone 6a, and is considerably warmer with minimum extreme temperatures averaging from -10 to -5 ºF.

There is a more diverse population of grafted varieties at the Ottawa site because graft failure has been more frequent. These failed grafts or any inferior seedlings have been replaced with newer grafted varieties that have come on to the market **(fig. 2).**

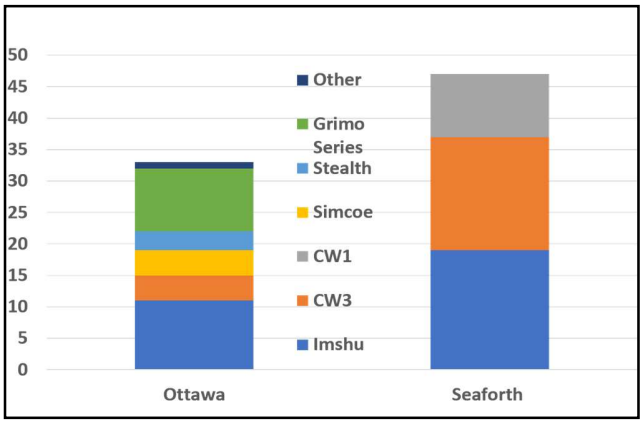

Figure2: Number of grafts of each cultivar

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I have been recording temperatures at different spots on the Ottawa site for the past decade using Microlite temperature loggers. Extreme minimum temperatures vary considerably from year to year and are more severe in the planting spot near the creek, which is about 12 feet lower in elevation (https://en-ca.topographic-map.com/) than the spot about 800 feet away where most of the heartnut trees are planted **(table 1).** Temperatures have not been recorded at the Seaforth site, but proxy data are available from the Halifax International Airport, the nearest official weather station.

Climate: Minimum Winter Temperatures, Frost-Free Period, Precipitation and Heat

Because the airport station is further inland it is likely to experience somewhat colder winter temperatures than the coastal "Seaforth" site. The lowest winter temperatures at the Halifax airport weather station are clearly far less severe than at my Ottawa heartnut site.

Despite the severity of winter temperature lows at the Ottawa site, it is important to recognize that research on the freezing tolerance of Japanese evergreen and deciduous trees has shown that the leaf bud and xylem of Japanese walnut can survive temperatures as low as -58 and -40 ºF, respectively (Sakai 1978).

Temperatures in the creek area fell as low as -39.8 ºF during the winter of 2021-22; however, the seedling heartnut trees in the vicinity of this temperature gauge showed no cold temperature damage, which is consistent with the results of this freezing tolerance research.

There was only very limited testing of flower bud resistance to cold temperatures in this study, but if the freezing tolerance of Japanese walnut flower buds is similar to other tree species that were tested, it would be lower than with the leaf buds. There were nuts on a nearby butternut-heartnut hybrid this past season despite the extreme winter cold. This is perhaps not surprising given that its genetics would embody DNA from the butternut which is native and well adapted to the region's cold winter temperatures. The heartnut grafts growing in the slightly more elevated section of my field faced a winter temperature as low as -31 ºF **(table 1),** yet also produced nuts this past season suggesting that flower bud tolerance to cold temperatures is at least as low as this temperature.

Winter	Creek	Upper Field	Halifax
	Degrees Fahrenheit (oF)		
2012-2013	-35.3	-30.0	-8.5
2013-2014	-35.5	-29.2	-8.7
2014-2015	-36.2	-24.7	-7.1
2015-2016	-26.7	-21.8	1.2
2016-2017	-24.9	-23.4	-3.3
2017-2018	-34.2	-25.6	1.4
2018-2019	-25.6	-17.7	2.5
2019-2020	-32.6	-24.3	-4.5
2020-2021	-26.3	-17.3	6.3
2021-2022	-39.8	-31.0	-3.8

Table 1. Lowest winter temperatures recorded from the temperature logger near the creek (frost pocket) and upper field at the Ottawa site and from the Weather Station at the Halifax International Airport for the Seaforth site.

The length of the frost-free period is another important consideration for growing nut trees. A period of 140 days without frost is considered the minimum for producing heartnuts (Gardner 1992).

You can see that this minimum is met most of the time in the upper part of my Ottawa site **(fig. 3, green bar)** but the minimum frost-free period is satisfied less frequently in the creek area of my Ottawa site **(fig. 3, red bar)**. The frost-free period is much longer at ….

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… is much longer at the Halifax International Airport **(fig. 3, yellow bar),** which I use as a proxy for the Seaforth site. Nevertheless, on rare occasions, extremely late spring frosts can occur at both sites, for example, on 4 June 2018 in Seaforth and 30 May 2021 in Ottawa. These unwelcome episodes are particularly damaging to newly planted grafted heartnut trees **(fig. 4)**. Despite new growth a few weeks later such newly planted grafts are typically so weakened that they hardly ever survive to the following spring and new growth originates from the rootstock.

Heartnuts of nut-bearing age, however, typically leaf out high enough above the frost layer to escape frost damage. In Seaforth, with its steep slopes, I have seen on one occasion taller nut bearing trees at lower elevations damaged by the pooling of cold air descending from higher up the slope.

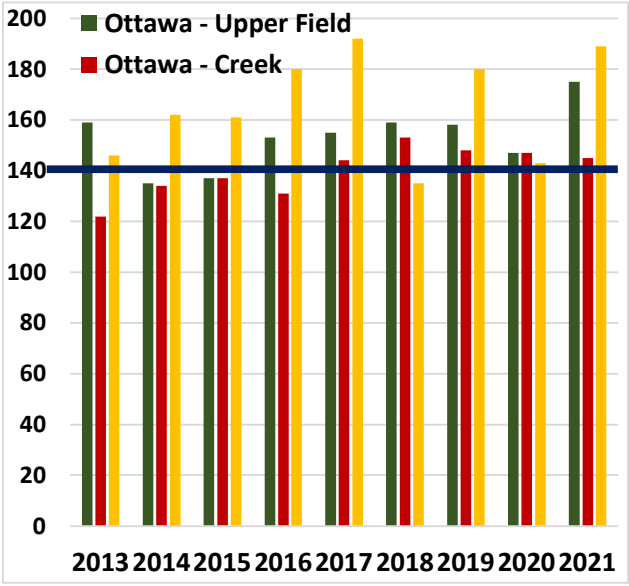

Figure 3: Frost-Free Period (Number of Days)

Rainfall data **(fig. 5)** does suggest that the Seaforth site gets somewhat more rainfall than the Ottawa site. The Seaforth site also has extra moisture in the form of fog **(fig. 6)** which may be why the leaves on the heartnut trees in Seaforth always seem greener, more abundant and larger than in Ottawa. However, extended days of fog during the pollination period may disrupt pollination and reduce nut production although I found no evidence of this.

Figure 4: Newly planted grafted heartnut damaged by an extremely late spring frost on 30 May 2021

Nuts need heat to mature. This heat requirement is usually measured in growing degree days above a certain threshold. It is suggested that heartnuts along with many other northern nut tree species require at least 1055 growing degree days based upon a threshold of 10 °C. Growing degree days from 1997 to 2021 averaged 1283 days at the Ottawa site which is more than enough heat for maturing heartnuts.

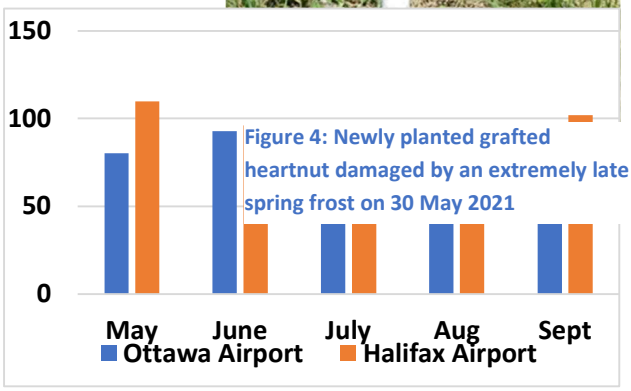

Figure 5: Rainfall (in mm) (Average 1981 to 2010)

In contrast, growing degree days at the Seaforth site average only 983 days according to proxy data from the nearby Halifax-Shearwater coastal military airport base. The cold coastal waters delay vegetative growth in the spring and keep early summer temperatures cooler than inland. Despite fewer growing degree days, the nuts in the Seaforth orchard do seem to mature satisfactorily, although nut harvest for a given cultivar is about two weeks later than in the Ottawa orchard.

Soil Conditions

My heartnut orchard in Seaforth is planted on a land formation called a drumlin. These are broad dumps of sediment left by glaciers when they retreated 10,000 years ago **(fig 7)**. As a result, the soil is a deep, acidic sandy loam **(fig. 8)**. Wood ashes and ground limestone are added to raise the pH to the level acceptable for heartnut (pH 6 to 7).

In sharp contrast, the soil in the Ottawa orchard is clay and becomes increasingly firm deeper than 5 inches **(fig. 9).** Adding soil volume by planting on mounds and additions of organic material like wood mulch, manure and leaves have been used to try to offset part of the deficiencies posed by shallow soil. Cont'd on pg 7

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Disease Pressure

I have not observed any disease pressure on my heartnut trees in Seaforth. However, during the 2019, 2020, and 2021 growing season, my heartnut trees in Ottawa have undergone considerable drought stress, likely aggravated by planting them on 5 x 5 foot mounds to offset the seasonal high water table and shallow soil depth above an impermeable clay layer. As the dry weather persists some of the leaves on a few trees begin to turn a bright yellow. This is followed by more leaves and more trees showing the same symptoms. These leaves eventually brown, crinkle and drop by mid-summer. Healthy new growth appears when rainfall resumes.

Horizon	Depth Inches	Description
L-H	2- 0	Black, semidecomposed organic matter; pH 3.8.
Ae	0- 3	Pinkish-gray (7.5YR 6/2) sandy loam; friable; porous; pH 4.2.
Bfh1	3-10	Dark-brown (7.5YR 4/4) sandy loam; medium granular structure; friable; moderately porous; sticky when wet; pH 4.5.
Bfh2	10-20	Strong-brown (7.5YR 5/6) sandy loam; weakly developed, fine granular structure; moderately porous; compact; pH 4.9.
BC	20-30	Reddish-brown (5YR 4/3) loam; moderately firm; pH 5.2.
C	30+	Dark reddish brown (5YR 4/3) loam; firm; some stone; pH 5.2.

Figure 8: Soil Profile for Seaforth, Nova Scotia (Wolfville Series)

The following spring, mortality is observed in parts of branches or in entire branches for those trees which lost leaves during the previous summer. These branches are covered with black pimples (fig 10). A nurseryman suggested that these pimples may be the fruiting bodies of a fungus called *Phomopsis*. The identification of the fungus has not yet been confirmed in a laboratory; however, *Phomopsis* has been reported on Douglas Fir and other conifers in response to summer drought (Funk 1986).

Funk (1986) recommended that "pruning weakened and affected branches will help control the spread of the disease", a procedure I adopted this past season. Funk also recommended that "watering during long, dry periods will prevent weakening and predisposition to the disease." I need some form of irrigation even though "outbreaks of this disease are sporadic and usually short-lived, but permanent damage may be inflicted by extensive top-killing, girdling and death of the whole tree."

Nitrogen-Fixing Native Plants

Growth of my heartnut trees at the Seaforth site has been extremely rapid for those trees adjacent to the native speckled alder, *Alnus incana ssp. rugosa* **(fig. 11** background) compared to trees planted at exactly the same time without a neighboring alder shrub **(fig. 11** foreground). It is well known that the alder root nodules support nitrogen fixing actinorhizal fungus and likely increase available soil nitrogen in the immediate vicinity. Salmon et al. (2019) reported average nitrogen fixation rates for boreal alder savanna and shrubland communities around 45 pounds N per acre per year with a range of 3 to 140 pounds N per acre per year.

Figure 11: A heartnut tree without adjacent alder bushes (foreground) and a much larger tree growing with speckled alder bushes in the background.

The alders taught me an important lesson – liberally add nitrogen to enhance tree growth when alders are not nearby. I do so in the form of blood meal, an organic nitrogen fertilizer, for newly planted and very young heartnut trees in both Seaforth and Ottawa. The resulting growth response is always a welcome sight!

Many years ago, I applied after bud break in the spring a liquid fertilizer high in nitrogen (PlantProd 30-10-10 with micronutrients Evergreen, Tree, and Shrub) at my Ottawa site. Although I thought I was adding a safe dose I clearly didn't and I lost most of my three-to-four-foot tall grafted heartnut trees. The root stocks, however, bounced back very strongly. The young grafted heartnuts have always been more forgiving of my liberal additions of blood meal than with my additions of this liquid fertilizer, which I continue to use on my larger heartnut trees at both sites, except those near alders.

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Nut Harvest

My heartnut harvest in Ottawa has in more recent years been considerably lower than in Seaforth primarily due to squirrel depredation **(fig. 12).** My impression is that nut production in Ottawa prior to squirrel pilferage may be slightly lower due to the other factors previously discussed like cold winter temperatures, insufficient soil depth, and summer droughts **(fig. 12**). Unfortunately, I have not yet counted nuts on trees prior to squirrel pilferage to verify whether this is the case - an exercise for next year! In 2022 there are about 20 to 25 producing trees at both sites.

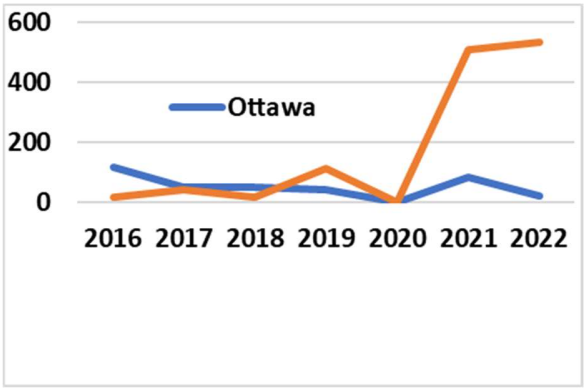

Figure 1Figure 12: Total number of nuts harvested at the Ottawa and Seaforth orchards from 2016 to 2022.

This past season nearly all of the nut production in Ottawa was plundered by squirrels. The only tree untouched by squirrels was a young "Simcoe" heartnut tree. Presumably, wasps from a nest in this tree harassed squirrels so much during their raids that they were deterred from removing the nuts. This past autumn I observed a squirrel stealing a nut from a tree in Seaforth, a sign that my heartnut trees in Seaforth have been discovered and that the prolonged respite from squirrel predation in Seaforth may be coming to an end.

Site Adaptation

Heartnut seedlings sprouting independently at both sites suggests that at the moment heartnut is adapting reasonably well to both sites despite site any limitations previously discussed **(fig. 14),**

Figure 14: Squirrel assisted regeneration of heartnut seedlings in the Ottawa orchard

Conclusions

The Seaforth site is clearly better for growing heartnuts given its milder winter temperatures, greater precipitation, longer frost-free season, and deeper soils. So far squirrels have not pilfered much of the crop and managing deer activity requires less effort now given that new branch growth on most of the trees is above the deer browsing level, although deer rub needs to be managed better.

The Ottawa site will require better management of squirrel depredation, the use of irrigation given the frequency of summer dryness, greater additions of organic material and fertilizer to offset as much as possible the drawbacks of shallow soils and considerably more active use of frost protection techniques on young tree stock when late spring frosts or early fall frosts are forecasted.

The Ottawa site is definitely more challenging. It requires more inputs and effort to mitigate its deficiencies. The comparison of these two sites illustrates what is undoubtedly obvious to at least experienced growers, if not to all growers, that not every piece of ground or location can support optimal nut tree performance.

I have, nevertheless, always enjoyed the challenges of pushing horticultural boundaries. The eventual outcome may not be ideal but with sufficient persistence, creativity, and hard work I still believe that the final results can be satisfactory despite the challenging circumstances. The outcomes so far have not yet deterred me from continuing to pursue my nut tree odyssey.

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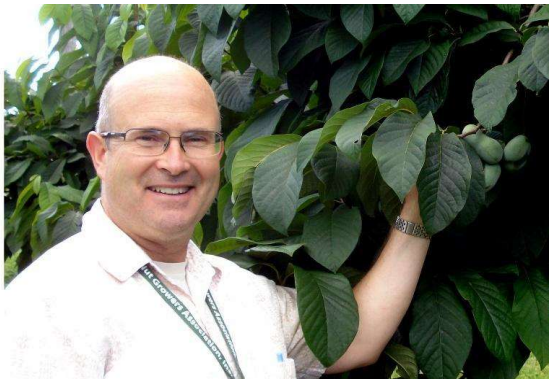
About the Author



Gordon Wilkinson (gwilkinson001@gmail.com) is a nut tree hobbyist who enjoys experimenting with a wide variety of nut tree species. He is an active member of both the Society of Ontario Nut Growers (SONG) and the NNGA where he serves as a Director on the Board along with serving on several of the NNGA committees. He was the NNGA's 2018 Big Nut.

Gordon's 2022 presentation to the NNGA related to this article can be found in the member's portal of the NNGA website (nutgrowing.org) as video 35 under 2022 Annual Meeting Videos.

Wanted

I have been the editor for well over 20 years and I would like to find a replacement to take this position over. You will have 4 newsletters to produce per year. If anyone is interested, please contact myself.
Bruce W. Thurston H. 519-740-6220, C. 226-922-9764, brewster113@yahoo.ca

CLASSIFIEDS

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