

The Rewards of Planting Trees

A Forest and Conservation History Tour through Guelph and Area.

June 14 2024 9:30 to 3:30

The City of Guelph and more particularly the Ontario Agricultural College properties have had a long history of innovative reforestation projects. We will see examples of these early plantings. We will visit the Arkell Springs site where there is an early example of using the forest to clean drinking water. We will visit a site where brook trout has been able to access the Speed River, as well as other sites of interest.

This year is the 150th anniversary of the Ontario Agricultural Collage and the 50th anniversary of the University of Guelph Arboretum

Terry Schwan, R.P.F. (Ret.)

Doug Larson, Emeritus Professor, Department of Integrative Biology, University of Guelph
Martin Neumann.

Other contributors to this program include:

Karen McKeown, Landscape and Yard Program Coordinator, Environmental Services
City of Guelph

Larry Halyk, M.Sc in aquatic ecology

Naresh Thevathasan, Ph.D. (Envi. Sc.) Adjunct Professor (Retired Associate Professor)
School of Environmental Sciences, University of Guelph

This tour is hosted by Forest History Ontario, and made possible by the generous support of our sponsor the City of Guelph. Proceeds go to support the activities of Forest History Ontario.



Agenda June 14, 2024

9:30 meet Parking Lot The Arboretum

Brown's Woods

Dairy Bush

Marden Creek,

12:15 Symposium Café, lunch

1:15 Arkell Springs tour

Former Agroforestry intercropping site

Zavitz Pines,

Victoria Woods.

University of Guelph Arboretum,

3:30 back to cars.

Frederick Stone, William Brown, and the beginnings of forest conservation

Dr. D.W.Larson, Emeritus Professor, Department of Integrative Biology, University of Guelph

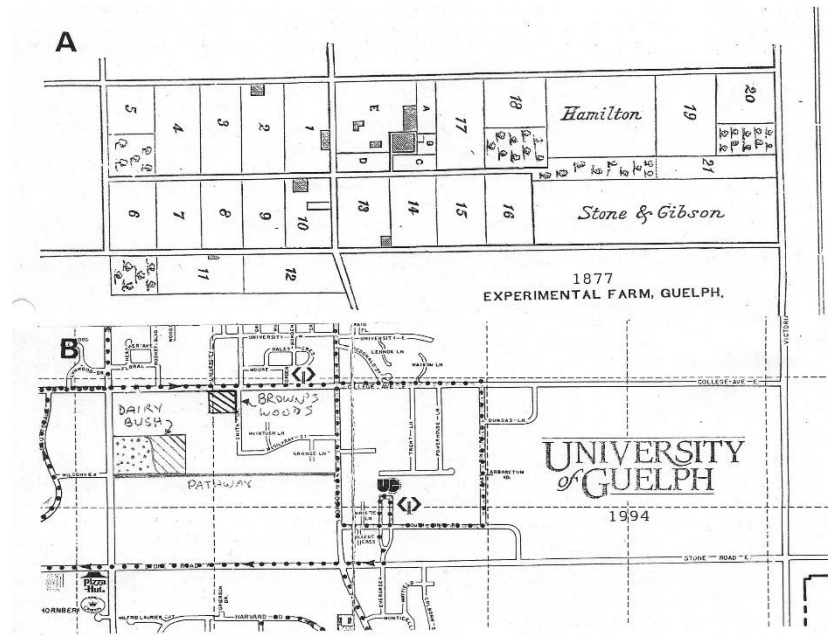
Well I guess we have to start with Frederick Stone. Because it was *his* farm that in 1874 was finally sold to the Ontario Government to allow the building of the Ontario College of Agriculture. Discussions and negotiations and battles had been going on for years in Toronto over the need to establish a scientific basis for agriculture. Various locations were considered close to the University of Toronto but for one reason or another, they were all rejected. Alex Ross's book *'The College on the Hill'* tells the story more completely than anyone else, but from an ecological point of view only one thing needs to be said.

Frederick Stone, like most other landowners, farmers and entrepreneurs of the time viewed land as a commodity to be exploited: either exploited to produce crops of plants and animals, or exploited as an asset to be bought and sold. Real Estate!! Stone had amassed a large collection of land holdings and when he had finally agreed to sell the main block of land in 1873- some roughly 600 acres - it was for \$40,000. This was an absolute fortune at the time. The land had been cleared of original forest with only one or two small stands of trees remaining. One of these stands was on the eastern edge of the property along Victoria Road and it can now be seen as the densely forested part of the *new* Arboretum called Victoria Woods, and the other part was a small 18 acre parcel (now known as the Dairy Bush) on the western edge of the property.

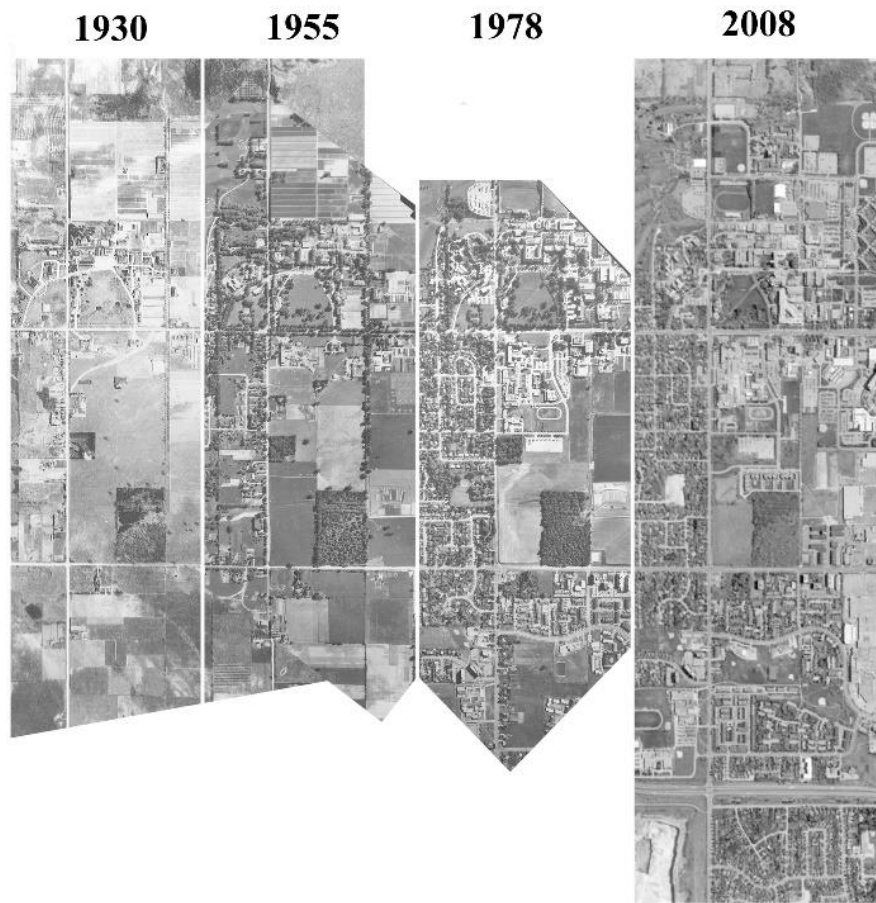


the oldest tree so far discovered estimated at 335 years and dating to 1687 (see graph and photo at the end of the text). The illustration below includes the only historical aerial photographs that exist showing the development of the Dairy Bush - or rather its constancy in the landscape - while the rest of 'southern Ontario' grows like an industrial/residential infection around it.

About 10% of the maple trees in the Dairy Bush are original growth with



A: map of the college grounds in 1874. Building sites shown as squares, forests as sketched trees. The largest building is where Johnson Hall is now. B: 1994 map of college grounds showing location of Brown's Woods and the Dairy Bush



Land clearing in southern Ontario has traditionally been viewed as *normal*. When Canada was first settled heavily by Europeans following the war of 1812, the extent of wilderness was almost complete. While farming by indigenous peoples had cleared some land in southern Ontario, the extent of tree canopy removal (to provide light and fertile soils for their crops) was vastly, vastly less than the canopy removal that was perpetrated by Europeans. Larson *et al.*(1999) shows that indigenous farming had probably removed 10% of the canopy in southern Ontario before contact with Europeans

about 1600. Contrast this with 50% of the original forest cover removed by 1880 and over 99% removed by 1987.

[citation: Larson, B.M., Riley, J.L. , Snell, E.A., and Godschalk, H.G. 1999. *The Woodland Heritage of Southern Ontario*. Don Mills: Federation of Ontario Naturalists.]

For colonists from Europe natural undisturbed forests were unknown and dangerous. Two thousand years of agricultural and industrial 'development' had removed the forest cover of most of Europe and Great Britain by 500 A.D. so natural, self-sustaining forests were rare. The danger came from three sources: 1. forests were the habitats of wild animals that would *eat* your babies. 2. forests were the homes of scary pagan indigenous people and 3. forests sat upon land that could be used to grow food *for your babies* provided they were not eaten or killed first by the Indians or the wild animals. In other words, Europeans had absolutely no idea that forests were good and that they should be protected as important features of the landscape. They did not know the history of Prussia. They did not know that Frederick the Great had rescued Prussian farmers from starvation by extensive planting of forests on cleared land that had been drained of nutrients and then eroded because of the lack of forest cover. Most had never seen real forests and most had no idea that forests support agriculture by retaining moisture and nutrients in the landscape, by resisting the erosion of land, and by the buffering of climatic extremes.

So they burned, dynamited, ripped, hauled, cut, chopped, and assaulted the majestic forests of southern Ontario anyway they could in order to decrease the perceived risks and increase short-term profits from the land. And Frederick Stone was no different. His land was cleared well after Guelph was founded in 1827, but by 1840 the land he owned was laid bare and stripped of its vitality except for two small parcels retained for fuel wood production. Photographs of our landscape taken in the late 1880's, and included in E.J. Zavitz' 1961 booklet reflect how bleak the altered environment was.

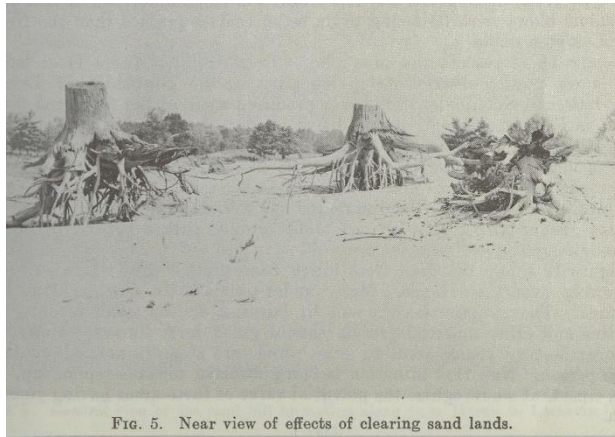


FIG. 5. Near view of effects of clearing sand lands.

[citation: Zavitz, E.J. 1961. *Fifty years of reforestation in Ontario*. Ontario Department of Lands and Forests.Toronto.]

To his credit, Frederick Stone tried to experiment with improvements in agricultural practice that would have the effect of reducing runoff and nutrient loss, reduce drought conditions and increase yields. But the calculation was always short term. So when the opportunity came to sell a large portion of his land holdings to the Ontario Government, Stone jumped at it. Well perhaps jump is an exaggeration since the Province immediately began to quibble and argue and mess the deal up. In fact, at one point Stone was ready to sue the Government for breach of contract but eventually the entire deal went through and the Ontario government had its *land* for the Ontario School of Agriculture and Experimental Farm. *But no people.*

But a committee had already been formed and a Principal selected by 1874. There was great flux and confusion in leadership caused by illness and mediocrity but by 1874 William Johnston was in charge and a Scotsman by the name of William Brown was chosen as the first Professor of Agriculture and farm superintendent. Brown was a big man with a big appetite for scotch, owned a big buggy and had big ideas about what was wrong with Upper Canada. And he was right!! His father James Brown - no, not *that* James Brown - had written the first comprehensive and scientific account of the methods of forestry in 1847 (*The Forester* - a book that went through many editions even after Brown's death).

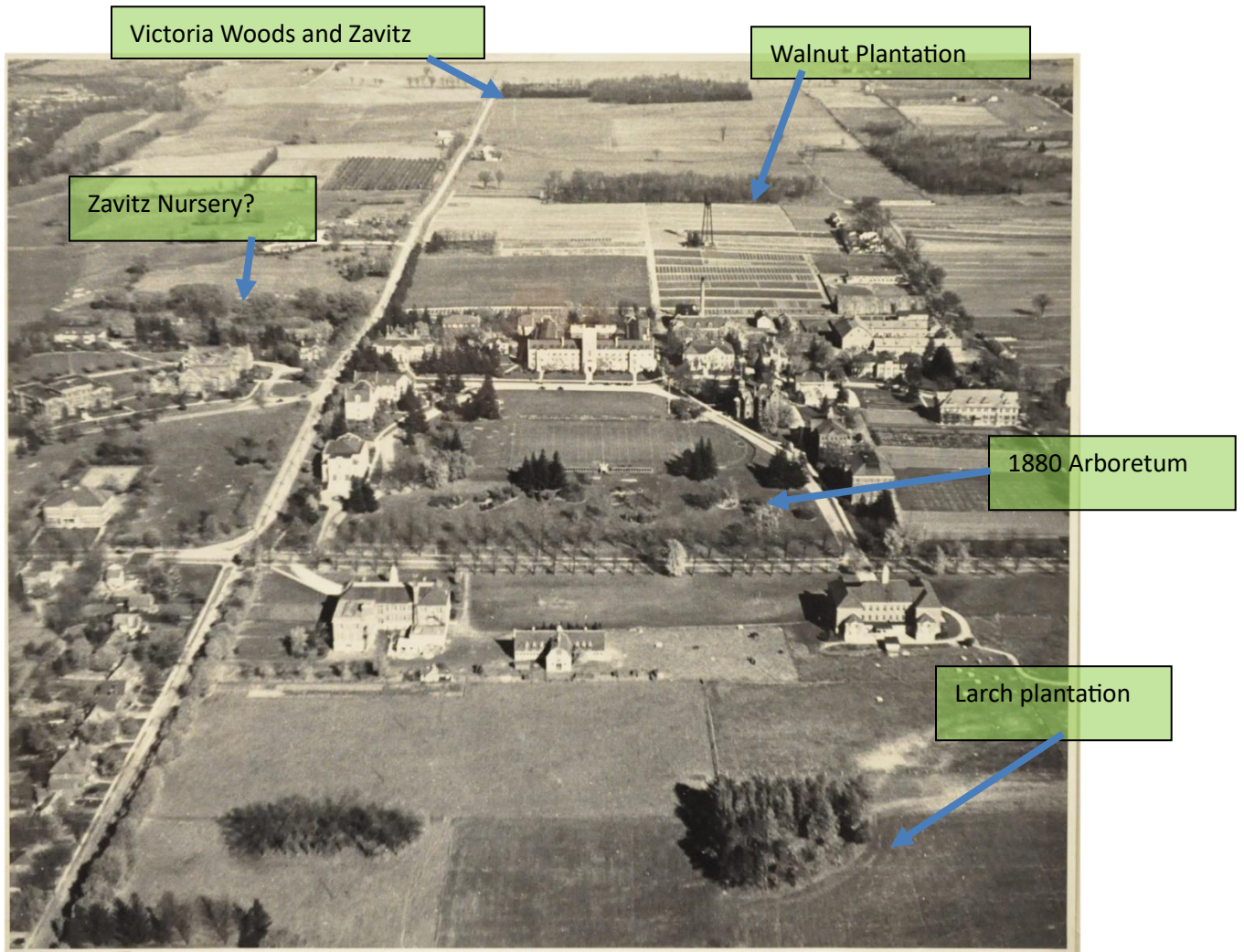
Brown the elder, along with son William had been responsible for the planting and reforestation of vast acreages in Scotland. Some 21 million trees were planted under their care. And this planting was done to service their shared underlying belief and hypothesis: that agricultural productivity could only be sustained at high levels if forests were part - and a large part - of the landscape. Forests were NOT the enemy. They provided goods and services that land needed if agriculture was to be carried out. Brown the elder had observed that the decline in the productivity of the land of Great Britain was reduced following land clearing by the Romans and that it stayed low unless forests were replanted. He knew well the work done by Frederick the Great in Prussia, and during the early to mid 1800's he and son William were trying to get Scotland to recognize its mistake and repair its landscape.



So when the 39 year old Brown arrived in Canada he saw a landscape being destroyed by clearcutting and land clearing using the same antiquated techniques that had undercut agricultural productivity in the U.K. And he wanted to stop it. While preoccupied with getting the "Farm" side of the "School" up and running, Brown must have been organizing teams to students to get ready for a series of large scale tree plantings on the campus. By 1880 only 5 seasons into the new school, and with the first graduating class already a year old, Brown initiated a series of single-species tree plantations, at least one multiple species plantation and lastly a formal 'arboretum' in the main area in front of the main school buildings to be used for teaching and research. In this arboretum was planted a wide variety of native and exotic hardwood and evergreen trees that had been grown by him in the college nursery north of College Avenue. The trees were about 5 years old when planted so it is clear that one of Brown's first missions when he hit the ground in Guelph was to start growing trees for shortsighted North Americans.

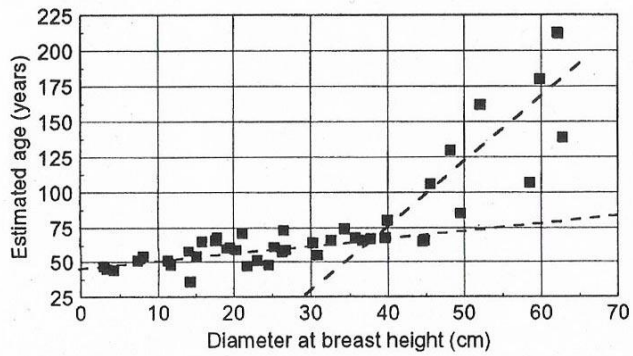
And plant trees he did. Black Walnut, butternut, hickory, sweet chestnut, European larch, English ash, birch, linden, elm, white ash, white spruce and of course, Norway spruce. As recently as 1954 you can see in some of the aerial photographs of the Guelph Campus, the thriving plantations put in by Brown and his students between 1879 and 1890. He always had fights with the then President Mills and he was eventually fired for insubordination in 1890. He died penniless in Australia in 1903. But his work lives on. All of the plantations shown in the above illustration are now gone: the big walnut plantation was removed when the stadium was built. The original Austrian pine and European larch plantation was destroyed in 2005 when an addition was placed on the veterinary science building. Luckily one of the remaining plantations bears his name: Brown's woods. It represents the oldest surviving experimental forest plantation in North America, and I wrote a research paper about the site in 1996. (<https://doi.org/10.1111/j.1526-100X.1996.tb00102.x>)

The naming of Brown's Woods in 1995 has saved it permanently from 'conversion' to a building site. Also, the Dairy Bush was a natural old-growth forest that was added to in 1893 by Brown's successor James Forsythe. Forsythe used the same broad array of both native and European species in the plantation. The dominant trees now in the plantation side of the Dairy Bush are sugar maple, white ash, and black walnut. Under the guidance of Forsythe and subsequent head Groundskeepers including the current head of grounds John Reinhart, it remains as the second oldest experimental forest plantation on the continent.



Aerial view of the east campus about 1940. Several of Brown's plantations are visible. In the foreground to the right is the larch plantation. To the left front is Brown's Woods. Towards the top of the photo is what is now called Victoria Woods. The walnut plantation is below that - now the site of the sports fields. The nursery for trees is north of College Ave on land that is now the Cutten Club. The original arboretum is in the centre of the frame.

Estimated age of maples in the Dairybush (based on core samples) as a function of diameter at breast height



About 10% of the canopy is original growth, while the remainder is second-growth.



48 cm cross section of sugar maple felled during windstorm May 2022. Estimated age: 335 years.

Ignatius Dam Removal Project – Marden Creek

Larry Halyk

Marden Creek is a 10 km long 2nd order stream that enters the Speed River just north of Guelph, Ontario. Native brook trout are currently present in the upper reaches, but are less common downstream of Wellington County Road 7 (Elora Road). The Wellington County Stewardship Council (WCSC) adopted Marden Creek in 1999 with the goal of extending the range of the existing brook trout population downstream to the Speed River. The main challenges to achieving this goal were identified to be high summer temperatures, barriers to fish movement, and degraded spawning habitat.

Between 2005 and 2009, the WCSC and their primary partner, the Speed Valley Chapter of Trout Unlimited Canada (TUC), had removed or modified ponds, dams and blockages at several locations to narrow the stream channel, lower stream temperatures, and allow fish to move freely within the stream. The Ignatius Dam, was removed in October 2010.

This 2.1 m high dam was located on property owned by Ignatius Jesuit Centre of Guelph (IJC). The IJC lands are separated into east and west parcels by Highway 6, which also transects the impoundment created by the Ignatius Dam. To the west of the highway, the property is an organic farm, over 200 hectares in size; to the east, roughly 40 hectares. The property is used as a religious retreat and is visited by thousands annually. One initiative currently being led by the IJC, on the east side, is the *Plant an Old Growth Forest Project* which seeks to convert much of the valley lands along Marden Creek and the Speed River on the IJC property back to a more natural condition.

The IJC dam removal converted a shallow 2.9 ha impoundment into 1.5 km of meandering stream channel. To minimize the risk of downstream sediment movement, the pond level was lowered slowly using siphons prior to removal of the dam structure. This technique allowed the stream to find its own channel through the accumulated silt sediments and avoided the need for channel design or construction work.



The Ignatius Pond looking upstream (west) of highway 6 on June 2003. This portion of the pond had a uniform depth of 30 cm or less and was subject to frequent algae blooms.



The Ignatius Dam during a snowmelt event in February



Looking upstream (west) of the dam site on September 25, 2010. The gradual drop in pond elevation had allowed a meandering channel to form.

The exposed silt flats were seeded with annual rye grass immediately following the lowering of pond levels, but germination was not sufficient to establish a complete vegetative cover prior to the end of the growing season. An estimated 1,500 kg of carp were captured during and after pond removal. These fish were humanely destroyed and buried on site. The remainder of the fish community (primarily bass, sunfish, and minnows) were either captured and transferred live to nearby ponds, or allowed to escape downstream to the Speed River. One brook trout was captured in the formerly impounded area on October 30, 2010.

Following the dam removal, rehabilitation work focused on restoring wetlands and other riparian features in the vicinity of the former reservoir. This included two major tree planting initiatives in 2012 and 2013, bioengineering and instream structures (sediment mats) to narrow the stream channel, and physical controls (tarpaulin placement) to discourage colonization by invasive Phragmites.

This project has contributed significantly to the overall program restoration goal of range expansion of native brook trout downstream to the Speed River. The direct financial cost of the dam commissioning activities in 2010 was approximately \$100,000 with an additional in-kind contribution valued at approximately \$25,000.

Larry Halyk



Community tree planting events like this one upstream of highway 6 were hosted by the IJC, TUC and WCSC, and were held in the springs of 2012 and 2013.



A Marden Creek brook trout captured upstream of highway 6 at the site of the former Ignatius Pond on October 30, 2010. This is likely the first trout to inhabit

Arkell Springs – City of Guelph

Martin Neumann

Guelph is the largest community in Canada to be almost entirely groundwater reliant. Arkell Springs is the source of 60 – 70% of that water, and also hosts the largest forest owned by the City of Guelph – although not in Guelph (Welcome to Puslinch Township!). The various properties were acquired over the past century and returned to forest in an ongoing, century-long project. Perhaps not surprisingly, E. J. Zavitz got the reforestation ball rolling, and it is thought that his plantings at Arkell Springs constitute the earliest Canadian reforestation project undertaken principally to protect a municipal water source. The groundwater wealth around Arkell owes much to glacial deposits, described in this excerpt from the current forest management plan. *The landscape in the area is dominated by glacial influences, primarily gravelly glacial deposits associated with the Horseshoe Moraine and some nearby drumlins associated with the Guelph Drumlin Field to the north, and the glacial spillway valley (now occupied by the Eramosa River) that cut down through the till. Kettle lakes and depressions are common within the moraine area and the more level areas are fertile till soils that are still in, or recently abandoned from, agriculture. The City of Guelph properties contain examples of all these features.*

Like other cities or towns in southern Ontario, Guelph's origin story is built on tree removal. The best-known tree removal in Guelph is the large maple ceremonially felled to represent the founding of Guelph. John Galt, agent for the Canada Company, took the first couple of swings with the axe for the “photo op” moment and the historical credit, and then stepped aside for the designated woodsmen to finish the job. The date was April 23, 1827 – missing Earth Day by just one day. John Galt's own thoughts about the moment could be mistaken for a present-day Earth Day piece.

“To me at least the moment was impressive, and the silence of the woods that echoed to the sound was as the sigh of the solemn genius of the wilderness departing forever ... The tree fell with a crash of accumulated thunder, as if ancient nature were alarmed at the entrance of social man into her innocent solitudes with his sorrows, his follies, and his crimes. I do not suppose that the solemnity of the occasion was unfelt by the others, for I noticed that after the tree fell, there was a funereal pause as when the coffin is lowered in the grave.”

Not only do the words now seem prescient, but also it's surprising that he had the energy to articulate such insights, considering that on that same day he had walked well over twenty kilometers through the forest, and possibly a few extra kilometers when his group got lost in the woods. Serendipitously, he stumbled upon one Mr. Rife, practically the only settler between Galt (now Cambridge) and soon-to-be Guelph, and he helped John Galt find his way.

That felled maple tree was just the beginning: countless trees were felled thereafter, as first a trickle, and then a wave of European settlers swept in and carved farms and towns from the mostly continuous forest cover. So much so, that by the turn of the century, the negative effects of forest clearing were becoming evident and alarming, sowing the seeds of transformed perspectives. Forest cover by then may have reached its local low point, thought to be around 5%.

Of course, removing trees for settlements and fields was nothing new to the area. The agrarian Attiwoonderk (Neutrals), whose territories coincide closely with what is now commonly known as the

Carolinian Forest, managed the landscape for their benefit until their violent dispersal around 1650. The largest indigenous village site yet studied by archaeologists in Ontario is just 5 km south of Arkell Springs, and is known as the Ivan Elliot site, near Badenoch. It was thought to house as many as 4,000 people. Villages were necessarily moved every ten to fifteen years as wood, soil, and wildlife became depleted, creating a patchwork of forests in various stages of succession.

The long-standing neutrality of the Attiwonderonk in hostilities between the Huron-Wendat to the north and the Five (now Six) Nations Iroquois Confederacy to the south failed to protect them from the latter in what became known as the Beaver Wars. Those Attiwonderonk who survived either fled or were assimilated. Famine, disease, and conflict had already brought them from an estimated population of 40,000 to 12,000. Consequently, the region was rapidly depopulating in the first half of the 17th century, and the catastrophic outcome of war suddenly reduced the established agricultural settlements and corn-bean-squash-sunflower fields to a much lighter presence on the landscape.

For that reason, when John Galt turned up some 175 years later, it's reasonable to imagine that indigenous village and field sites had regrown for long enough to look like primordial forest to the eyes of European settlers. Indigenous peoples frequented the area for hunting, and game was reportedly plentiful. As settlers became more numerous, the newcomers and pre-existing inhabitants developed reciprocal economies, with settlers trading potatoes, bread and milk for venison and fish. At this point, the Mississaugas of the Credit seemed to be the indigenous people most frequently using the forests between settlers' clearings.

The darkness of the forest so oppressed the collective settler psyche that John Galt set upon a scheme to make Guelph more enticing to would-be settlers: he cleared an extra-wide 40-meter swath for 11 kilometers to create a grand glade-like entry on the (only) road into town. It is said that this entrance to town rivalled Niagara Falls as a tourist attraction for a time, which, frankly, beggars the imagination, but it does give a sense of how much they appreciated a big gash in the otherwise (mostly) continuous forest cover.

By 1900, some provincial leaders were beginning to realize the need to counter the evident and growing damage caused by unfettered deforestation, such as desertification and stream flow extremes. The idea of planting trees began to grow, even as hinterland areas were still being cleared. In Guelph, leaders were getting serious about establishing a communal water source to eventually replace the collection of private wells. They found what they sought near Arkell, and purchased 98 hectares of land around the springs in 1908 (not all of these hectares were at the main tract that is the focus of this story). Once the clean spring water was piped to Guelph, it immediately showed benefits, including increased fire-fighting capacity and, according to Dr. H.O. Howitt, medical officer of health, an end to typhoid mortality.

E. J. Zavitz was then a forestry lecturer at nearby Ontario Agricultural College, and he began a multi-year reforestation effort for the protection of Arkell Springs. In 1910, 275,000 trees were planted, of Scots pine, white pine, white spruce, and tamarack. This was followed by 13 years of replanting 5,000 – 10,000 annually, and then 4 years of expansion plantings of 15,000 annually. That was the beginning of big things for Arkell Springs and one of the early projects leading to big things for Zavitz [*more about Zavitz at The Arboretum stop*]. These are the trees that tower over the service road that begins our bus tour loop through this important groundwater-protecting forest.



The Arkell Springs Forest was established by the City of Guelph in 1910 as a Municipal Forest for the protection of the springs which provide Guelph with its water.

The initial Zavitz push of reforestation was followed by an expansion push in the 1960s and 70s, after an additional 227 hectares was acquired in 1962 (today's total of City-owned land at the main tract of Arkell Springs is approximately 292 hectares; there are additional City-owned, Water Services-managed lands not covered by this story). These plantings were mostly undertaken by the Grand River Conservation Authority (GRCA), with technical support from Department of Lands and Forests. At least 332,000 trees were planted, with species selection from the familiar palette offered by provincial nurseries, similar to the initial species list, but adding a few, such as white cedar and black

walnut, and most notably, large numbers of red pine.

The City of Guelph pressed the GRCA to acquire additional lands to further buffer and protect the core Arkell Springs landholding. These properties are known as Starkey Hill (81 ha) on the south side of the complex, across Arkell Road, and to the north across the Eramosa River, the Smith Property (156 ha). The reasoning for the GRCA to acquire these lands, instead of the City, may have been a favourable financial incentive, as the province would cost-share 50-50 on eligible land acquisition by conservation authorities. The properties were acquired in 1971/72, and in the early years of ownership, GRCA reforested 43 hectares at Starkey, and 78 hectares at Smith.

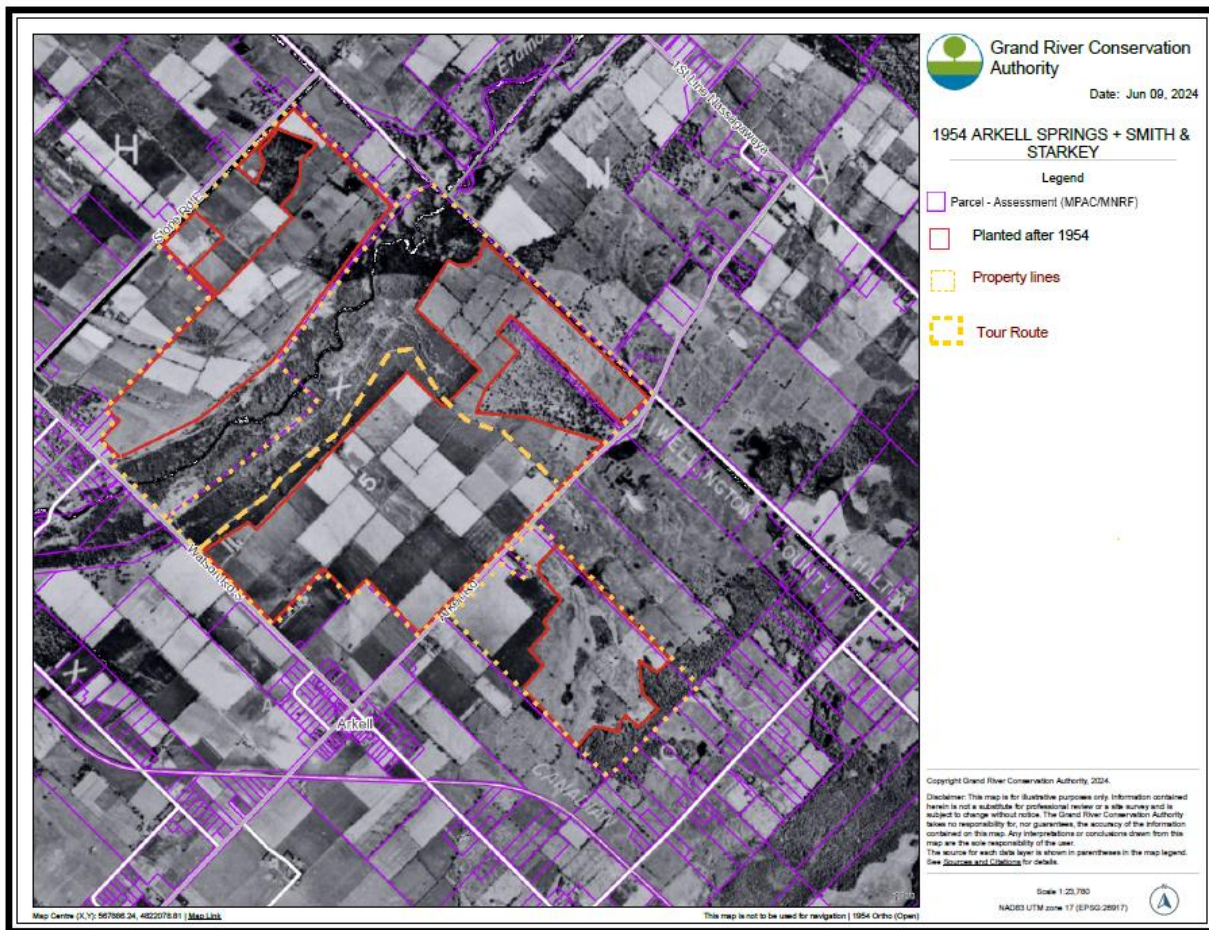
Between 1995 and 2003, another big push saw about 180,000 trees planted by GRCA on the main tract of Arkell Springs. This initiative was mainly intended to eliminate the residual tenant farming. This was a turning point of sorts in the history of Arkell Springs, as it seems that the management style became more open to community engagement in several ways.

The property complex had been viewed as a well field with some trees, and trespassing was forbidden as a necessary groundwater protection tactic. The reforestation of the last cultivated fields on City property probably fed into the increased recreational access pressure. Between that pressure and a need to undertake a first forest management plan, a new era seemed to emerge: a community forest coexisting with the well field within it. Of course, Water Services, the land manager, continues to put water security as the top priority, and rightly so. They must balance the risks and rewards, and in that context, decide how to handle recreation and forest management activities.

Both Starkey and Smith properties quickly became very popular for their walking paths of about 4 kilometers each. But the forbidden fruit behind the City's No Trespassing signs called out to some. Perhaps the percussive reports from the on-site City police firing range made the prospect even more alluring. Today, there are marked trails on the City land for the use of Guelph Hiking Trail Club members,

and Guelph Off Road Biking Association trails for use by their members. About 10 kilometers of recognized trails now exist on the City lands, plus the extensive and separate service road system. The recognized (permitted) trails are laid out to avoid key operational areas of the well field.

The first forest management plan was produced by Williams and Associates (Pete Williams, RPF), in 2002. The renewal plan (2023 – 2042) was completed by Silv-Econ (Dave Puttock, RPF). Implementation of these plans has been contracted out to Bartram Woodlands Ltd. (Dave Bartram - on the bus!). One example of a more public-facing approach is the partnership that has seen high school students in the Community Environmental Leadership Program (CELP) planting trees each year at Arkell Springs, since 2008. The plantings are meant to offset the greenhouse gas emissions of the school bus used for their program. The trees are provided by the Green Legacy Program, Wellington County’s tree nursery and educational program. The species are selected to diversify the species mix in existing plantations. These plantings are on-going, having planted more than 30,000.



Other ongoing forest management activities include routine plantation thinning, red pine pocket decline and white pine blister rust mitigation treatments, and control of invasives, mainly European buckthorn. Generally, pesticide use is not permitted on the City-owned lands at Arkell Springs, but after a thorough review, the City is currently allowing the use of Garlon on a trial basis for buckthorn control. Also on a trial basis for buckthorn control, they are using Lalcide Chondro, a fungal plant pathogen.

There's a lot going on at Arkell Springs, both historically and currently. The property is such a large block of mostly publicly accessible land with one of the largest local forests and provides most of Guelph's renowned water supply. Our tour format will allow us to barely scratch the surface of this fascinating site. Luckily, we expect to have some very knowledgeable people on the bus who would be happy to answer questions about Arkell Springs, specifically, and Guelph's municipal forestry more generally. Karen McKeown, currently City of Guelph Landscape and Yard Program Coordinator, was the project coordinator for land stewardship at Arkell Springs for 12 years. Bartram Woodlands has been active on the property for over a quarter century, and has been the main agent for implementing the forest management plans. Timea Filer, RPF, Urban Forester, can answer questions about Guelph's urban forest management plan and its implementation; she has been involved with Arkell Springs on an advisory level. Dave Beaton is Program Manager for Forestry, Horticulture, and Natural Areas, and can answer questions in any of those areas, or even Trails.

[A couple of bonus tidbits for survey nerds: Those with an interest in early land surveys may be interested to know that the first survey line in the region, known as the Jones Baseline, was surveyed by Augustus Jones in 1792. Around the same time, the boundary of the Haldimand Tract along the Grand River was surveyed. Those two early surveys mark the eastern and western boundaries, respectively, of Puslinch Township. Jones Baseline also demarcates the eastern boundary of the Arkell Springs complex. A 30-meter high triangulation tower was built on the highest point of Starkey Hill by the Geodetic Survey of Canada in 1911. This was part of the necessary groundwork for systematic topographic mapping of Canada.]

Main Sources

History of Guelph 1827 – 1927, Leo A. Johnson, 1977

Speed Conservation Report, Ontario Department of Planning & Development, 1953

Puslinch Profiles 1850 – 2000, Puslinch Historical Society, 2000

Two Billion Trees and Counting, John Bacher, 2011

Various slide decks, Karen McKeown

Reforestation files, Grand River Conservation Authority head office

Personal Communications, Dave Bartram

Intercropping trees and crops

Introduction

The University of Guelph intercropping plots were established in 1988 on 30 ha of degraded agricultural land (Figure 1.) with the aim of investigating the effects of intercropping trees with agricultural crops. A variety of spacing, crop compatibility and tree growth and survival experiments were initiated at that time, using trees such as spruce, pine, walnut, ash, sugar and silver maple, black locust, red oak and hybrid poplar. Tree rows were spaced 12 or 15 m apart and trees within each row were spaced 5 or 6.25 m apart (Figure 2.). Three agricultural crops (soybeans, corn and winter wheat), were grown between the rows under normal rotation.



Figure 1. University of Guelph Agroforestry Research Site: a) before introducing trees.



Figure 2. University of Guelph Agroforestry research site 32 years after introducing trees.

Why introduce trees to agricultural fields?

Southern Ontario has an average of approximately 7% tree cover. Introducing trees to fields is one way of increasing this percentage. With the careful selection of tree species and crop combination, numerous positive interactions with field crop growth can be obtained.

Benefits obtained from trees

- Maintenance or increase of soil organic matter.
- Improved nutrient retention on site.
- Reduced soil erosion.
- Reduced nitrate leaching
- Crop protection against wind.
- Maintenance or improvement of soil physical properties.
- Modifications of extremes of soil temperature.
- Increase in earthworm populations.
- Long term revenue.
- Increase in biodiversity.

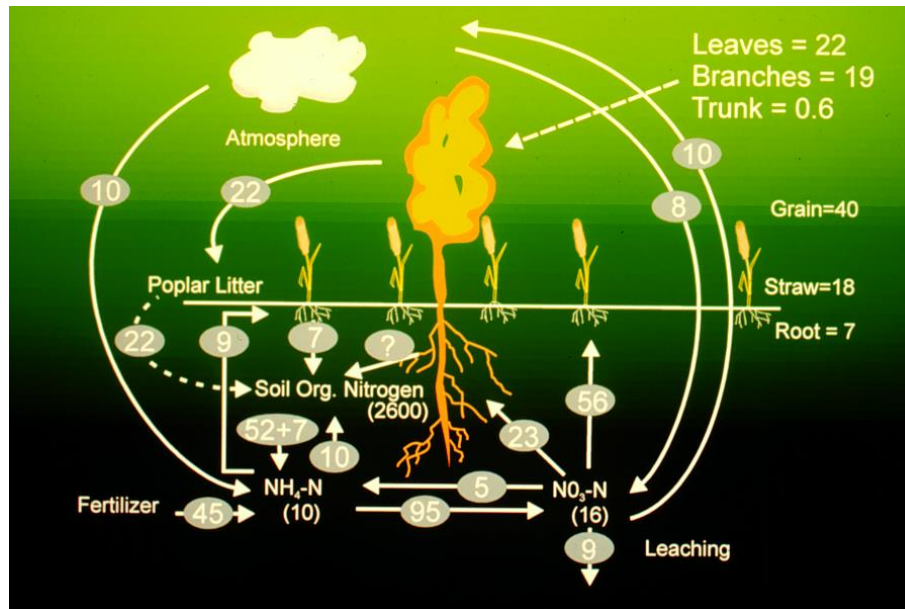


Figure 4b. N cycling in a tree/crop intercropping system.

Research findings

- Trees add organic matter to the soil through litter fall and root decay. The contribution of intercropped trees may to increase soil organic matter by 30% over a period of 8-10 years. Increases in soil organic matter also improve soil physical and chemical properties that can result in increased crop yields. The value of the land can also potentially rise due to better topsoil.
- Tree roots act as a pump, obtaining nutrients from lower soil horizons and depositing them on the surface where they are available to the crop.
- Tree rows prevent soil runoff and also help to prevent wind erosion. Tree rows significantly reduce wind speed within the crop rows and therefore lessen moisture losses due to transpiration and evaporation.
- Earthworm numbers increase. This improves soil structure, porosity and nutrient status of the soil.
- A cost/benefit economic model developed at Guelph has found that the intercropping system demonstrated at the research site is profitable, given even a modest positive interaction between the trees and crops (e.g. reduced fertilizer N-inputs next to the tree row can be realized as leaf drop will provide some N input).
- Intercropped fields are much more diverse in bird species than monocropped fields. The tree rows can also provide wildlife corridors between other habitats.

Intercropping concerns

- Tree roots clog tile drains.
- Competition for light.
- Competition for nutrients.
- Competition for water

Remedies and solutions

- Disk ploughing the cropped area on either side of the tree row will eliminate the potential for large tree roots growing near the surface. The roots are forced to grow to a deeper depth and obtain nutrients that are unobtainable to the crops. Some of these nutrients are released to the soil during the fall.

- At the stage when competition for light is a factor, crops of a higher shade tolerance should be grown (i.e. corn should not be grown). With appropriate tree management (i.e. pruning, spacing, and species selection), the onset of this stage can be delayed.

Thinking about Intercropping ?

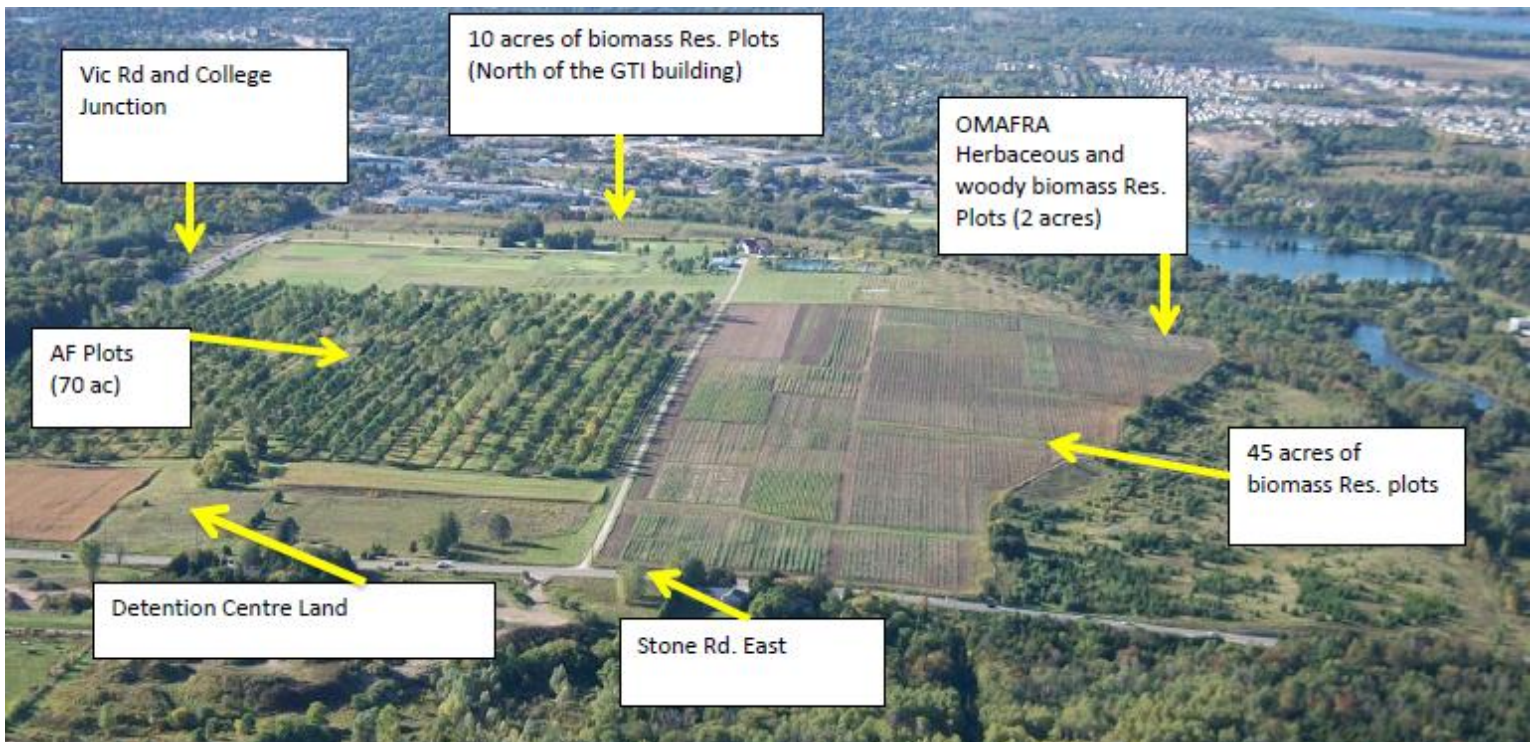
- Can be done on prime as well as on marginal lands
- Attention should be given to the selection of the components (trees and crops)
- Short term and long-term goals have to be defined (economic and environmental)

Between tree row spacing can range from 15 m to 30 m and within tree row spacing can range from 6 m to 8 m. Important management strategies (e.g. disk ploughing, pruning etc.) must be carried out to minimize competitive interactions.

For further details please feel free to contact:

The Agroforestry Research Division
School of Environmental Sciences
University of Guelph
Guelph, Ont. N1G 2W1

Phone: (519) 824-4120 (Ext. 52565)
E mail : nthevath@uoguelph.ca



Zavitz pines and Edmund Zavitz

Forest conditions

Terry Schwan

When Edmund Zavitz came on the scene in 1904 the forests of southern Ontario were in a terrible condition. He commented on this situation in his report *Reforestation of Wastelands in Southern Ontario in 1908*.

“The disappearance of the forest and woodlot throughout this region is a topic which has been widely and frequently discussed. Early in the 1880’s we find reports which were compiled at the instance of the Ontario Government, calling attention to the necessity of preserving and replanting forests in this region. Little heed was given to these reports so far as the adoption of any policy was concerned.

To a large extent the only woodlot left in the settled portion of the province is the farmer’s woodlot. At least 45 townships, have as low as 5 per cent of Woodland. In 1904, the municipal assessors’ returns gave less than 15 per cent of woodland for all the settled Township.

It is practically impossible to buy, in any district in Ontario, commercial quantities of any of the more valuable hardwoods such as white ash, rock elm, hickory, etc. Through severe culling, and opening the wood to cattle, much of the remaining woodlands are only remnants, with either defect, defective or undesirable trees left.

The forest problem on private lands includes the better management of existing woodlands along with the replanting of waste portions of untillable soils. This will always be a most difficult problem. Private management of small parcels of forest land in older countries, as France and Germany, where the science of forestry has long been practiced, is still very unsatisfactory. Owing to the longtime element in maturing wood crops, private management is often weak and uncertain.”

Further to this Judson Clark, Provincial Forester, stated;

*“During the fall term a course of lectures having special reference to farm forestry was given at the Ontario Agriculture College in Guelph. The interest taken by the students both within the classroom work and in the frequent excursions to woodlots and plantations in the neighborhood was all that could be desired. **Unfortunately, the woodlots in the neighborhood of Guelph having in recent years become so badly deteriorated through unwise cutting and by grazing by livestock that it was impossible to show the students any examples of the results of wise management** (my emphasis). Consequently, the practical demonstrations were necessarily largely limited to the showing of what should not be done and why “*

Ontario. Annual Report of Bureau of Forestry. 1904. Sessional Paper 4 1904. p. 7.

The urgency to protect orchards and woodlots and replant wasteland and other poor agricultural land was advocated first by the Ontario Fruit Growers Association, The Ontario Agricultural College (as previously mentioned) and later by the Ontario Agricultural Experimental Union. The Experimental Union was

formed in 1879 by officers, students and ex-students from the OAC with the objective of establishing a system of cooperative experiments throughout the province. However the Experimental Union did not benefit forestry until 1900, when at the annual meeting a forestry committee was appointed. No decisive action occurred until 1902 when a resolution moved by Nelson Monteith (later Minister of Agriculture from 1905 to 1908) and seconded by E. C. Drury (later Premier from 1919 to 1923), asked the Department of Crown Lands provide seedlings to reforest the large areas of wasteland.

The next year, 1903, another resolution was presented demanding, in short:

- Establish a school of forestry
- Collect accurate information from municipalizes on the amount of lands unfit for agriculture
- Undertake reforestation of large areas
- Adjust taxation to encourage preservation of farm woodlots



Fig. 4—Woodlot to the left of the fence has been protected from stock.

Both Minister of Agriculture, John Dryden, and Commissioner of Crown Lands, E. J. Davis were receptive of the ideas presented. The immediate result was to appoint Judson Clarke a graduate of OAC and Cornell forestry school, as the first Provincial Forester in the in the Crown Lands Department with responsibility for forestry in southern Ontario. In 1905 the position was moved to the Department of Agriculture as the Bureau of Colonization and Forestry. Clarke resigned in 1906 and moved to British Columbia.

Meanwhile in 1904, Minister Dryden took immediate steps to starting a forest tree nursery at the OAC. And who did he hire but Edmund Zavitz. In the spring of 1904 Zavitz took a job at OAC Guelph and was offered \$50.00 a month. That summer he started a small nursery of two acres where forest seedlings were produced to furnish land owners with planting material.

Edmund J. Zavitz

Edmund Zavitz was born on July the 9th, 1874, at Ridgeway in Welland County. As a school boy, he roamed the woods in his neighborhood collecting moths, butterflies and other insects. But at 14 he dropped out of school and went to work for a summer on his uncle's farm. Then he worked for in Ridgeville variously as a clerk in the general store, as a plumber's helper, in the flour and feed mill, painting and in the village bakery. In 1894 at age 19, he went to Buffalo and took a business banking course and returned to Ridgeway to work as an assistant bookkeeper in Cutler's general store. In 1895, he attended St. Catherine's Collegiate and a year later, Woodstock College, a boys' boarding school.

In 1898, he entered McMaster University and received a BA degree at the age of 28 in 1903. At the time he was not sure where he was going to go unless it was teaching. One of his professors gave him a pamphlet where he discovered the forestry profession. At the time the only schools were in the United States. In the autumn 1903, he attended Yale Graduate School. In the following spring. He visited George

Creelman, president of the Ontario Agriculture College (OAC), and found out there was considerable interest in forestry.

During these times Zavitz became acquainted with a number of prominent individuals interested in forestry, among them Judson Clark, who graduated from Cornell College School under Bernhard Fernow. He also met Thomas Southworth, the Clerk of Forestry in the Bureau of Forestry, in the Department of Agriculture. Southworth had been reporting on forestry issues since 1896 in his annual reports. He was advised to spend his second graduate year at University of Michigan with Dean Roth. There he saw that forest conditions and problems were much the same as in Ontario.

So it's the spring of 1905. He's 31 years old, and he graduated from Michigan with the Master of Science of Forestry. In May of that year, he was appointed lecturer in forestry at the Ontario Agriculture College in Guelph. His duties were:

- to give lectures in forestry,
- develop nurseries to supply trees for reforestation,
- attend Farmers Institutes and
- begin a survey of the larger wastelands of southern Ontario.

In his first report to OAC Zavitz described the state and condition of the woodlots and plantation on the OAC property as well as the nursery he started in 1904. See the Appendix for a description of the forests at OAC. The first nursery behind MacDonald Hall off College Avenue was only two acres and was filled to capacity. He was able to get land on the Homewood property in the north end of Guelph. It was sandier soil and better for growing conifers. At first seedlings the pine were imported from the United States and had been previously imported from a German nursery.

Two plantations of white pine were planted in southern Ontario. The first plantation was made on a farm just north of Bowmanville, on the land of his grandfather Edmund Prout. And the second was made on the property of Nelson Monteith in Perth County the following year. That same year he married in late 1905 to Jessie Dryden whose father John Dryden was the Minister of Agriculture in from 1890 to 1904.

Zavitz reported the improvement work was done in all the College woodlots. Trees were pruned. Norway spruce was planted around the woodlot perimeter. Part of the Dairy bush was cleared (probably as a result of poor survival from Brown's planting effort) and planted with white pine. Woodlots were fenced. He also promoted leaving a small portion of woodlots for shade for cattle.

While at the OAC, he was called numerous times to Toronto by the Department of Lands, Forests, and Mines to make trip of inspection or reports on forestry matters. This included various national conference and tours to Northern Ontario.

By 1908 the nursery at OAC was limited by lack of suitable space. During his tour in southern Ontario to document the wastelands he became aware of the blowsand areas in Norfolk County. He received letters from persons in Norfolk concerned with the situation there.

He found suitable farms to establish a nursery and develop plantations to control the blowsands. However he had to convince the Minister, of Lands and Forests Frank Cochrane – a doubting Thomas. Finally a tour with the Minister convinced him of the need and within days Zavitz obtained the money to buy the first property and many others to follow.

In 1909 he moved the nursery to St. Williams in Norfolk County on recently acquired blow sands areas. This was Ontario's first Forestry Station. He convinced his two main staff at OAC, George Lane and Scotty Tedford to leave the relative luxury of Guelph and move to the wasteland area of St. Williams, to run the nursery and reforestation efforts. In the autumn of 1912 forestry operations were transferred to the Department of Lands, Forests and Mines from Agriculture and with it a move to Toronto. He was concerned with the administration of the Norfolk Forestry Station, in charge of fire protection along the railways in Ontario. He also carried out various forest investigations and lectured on forestry the students at the OAC. There were over one million trees in the ground at the NFS for distribution to farmers.



In 1921, the Counties Reforestation Act was revived by the Drury government. The Act allowed Counties to purchase land and enter into agreements with the Province for the administration and development of such areas. The County of Simcoe was the first to enter the program

He was appointed the Provincial Forester and later Deputy Minister of Forestry in 1926. He went on to develop the Department programs, including forest surveys programs, an efficient forest fire fighting organization and extension of reforestation programs.

He retired in 1949 although he was given a consultancy for five years. He died December 30 1968 at age of 94. He is buried in Hillcrest Forestville Cemetery near the Turkey Point Forest.

Zavitz, E. J. 1907. Farm Forestry. Ontario Department of Agriculture, Ontario Agriculture College. Bull. No. 155

Victoria Woods - History and Management

In 1905 this area was mainly a pasture field, with young elms on the wet land and a few other scattered hardwood saplings on the higher land. Conifer trees were planted in the corners of the area where the land had been fully cleared. After planting, the livestock were kept out of the area and the patchy woodlot regenerated to the to the main hardwood stand now present.

From 1940 to 1960, small amounts of fuelwood were removed and some of the lower limbs on the conifer pruned.

In 1960 the Department of Land and Forests assumed management. Because of the Dutch Elm Disease, the merchantable elm were sold. The buyer paid \$950 on the stump for about 35,000 board feet of logs of all grades. In 1962 the crop trees in the conifer stands were pruned of the side limbs to 17 feet. In 1963 cottonwood, a species of poplar, was planted on the wettest areas where the elm was cut.

In 1972 a further cut will be made of mature maple, basswood, ash and cherry timber. Also, the conifer plantation will be thinned.

The site was described as gently rolling with soil of variable depth, averaging 18" of loam till over medium to fine sand in layers. Moisture regime as fresh (2).

Describe forest

Adapted from Lands and Forests document, Growth studies in Hardwood Woodlots. Ontario Archives.

Zavitz, E. J. 1907. Farm Forestry. Ontario Department of Agriculture, Ontario Agriculture College. Bull. No. 155



Fig. 2.
Black Cherry in the College woodlot with Ironwoods in the background.



Fig. 23.—Showing use of mattock in planting on rough ground with stiff turf.

Planting Zavitz pines. College Avenue in background.

Zavitz, E. J. 1913. Farm Forestry. Ontario Department of Agriculture, Ontario Agriculture College. Bull. No. 209. A revised Edition on No. 155.

The University of Guelph Arboretum

To trace the history of the land, one must look far past the official creation of The Arboretum, to the natural history of the land itself and the many occupants and users of the land over time. The Haudenosaunee, Anishinaabe and Attawandaron peoples lived on and cared for the land that now hosts The Arboretum, the University of Guelph and the City of Guelph. Through the 1792 Between the Lakes Purchase Treaty No. 3, the Mississaugas of the Credit ceded over 3,000,000 acres of land to the British Crown.

After the land was ceded, the British Crown divided the area into tracts and sold them to wealthy individuals for development. John Galt, a Scottish businessman, author, and superintendent of the Canada Company which was responsible for populating a part of Upper Canada Galt first began developing Guelph in 1827 to attract potential settlers.

A few years later, in the mid 1850s, William and Ellen Hamilton purchased a 400-acre tract of land in Guelph. The Hamilton family worked to clear much of the area and develop a farm on this plot. In 1910, the family sold the land to the nearby Ontario Agricultural College to use as a research farm.

The idea for an arboretum to be used as a place of learning, research and land restoration was part of the earliest beginnings of the Ontario Agricultural College. The OAC first proposed an arboretum on the front campus in 1882. The Ontario Fruit Growers and a Philadelphia landscaping firm began developing the on-campus tree and shrub collections. A plan for a small Arboretum in 1938 never came to fruition due to a lack of funding for the project.

Over the next several decades, the notion of an arboretum lingered in the minds of O.A.C. professors. Many instructors believed that there was an opportunity in the Botany, Horticulture, and Landscape Architecture curricula that could be filled by an arboretum. Several proposals for an arboretum were submitted during this time but were postponed or rejected due to a lack of funding.

In 1963, the Arboretum Study Committee was formed by Professor R.J. Hilton. The Ontario Agricultural College was moving towards University status, and with the creation of the University of Guelph in 1964, it seemed like a good time to propose a new arboretum. In December 1970, the University of Guelph's Board of Governors approved the master plan for The Arboretum. After years of dreaming, The Arboretum was finally going to become a reality.

The O.A.C. Centennial Arboretum Centre was opened in 1974 to mark the 100th anniversary of the Ontario Agricultural College. Staying true to the vision of The Arboretum, Architect Raymond Moriyama designed The Arboretum Centre to blend



into its surroundings to allow visitors' attention to be drawn to nature. Yet this building is constantly full of activity because it is the administrative headquarters of The Arboretum. This building holds Arboretum staff offices, a large auditorium, meeting rooms, a private garden nook and much more.



The first collection plantings took place in May 1971. A small group of employees using only a tractor and a crew-cab truck planted a collection of maple trees on the grounds. These trees mark the first official collection of The Arboretum.

- The Arboretum, 1977

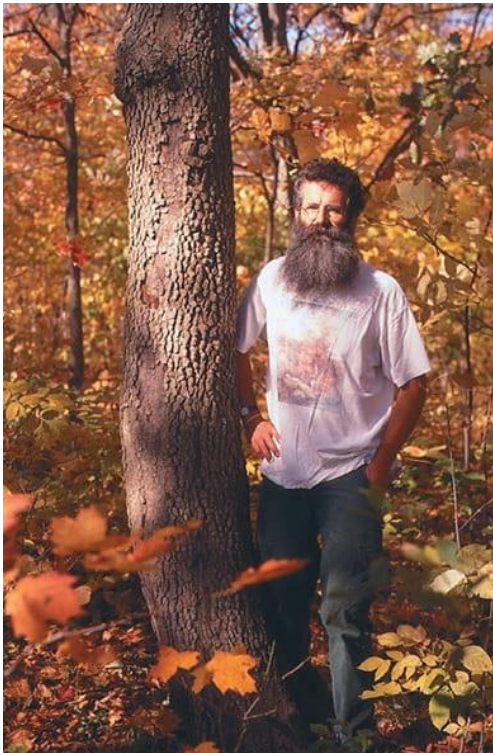
During the next several years, The Arboretum slowly began to take shape. Arboretum employees and volunteers worked tirelessly to transform the farmland with trees and plants, establishing the beginnings of the gardens and collections. Trail systems were developed to encourage visitors to explore the grounds. The Arboretum's infrastructure was developed and the [O.A.C. Centennial Arboretum Centre](#) (1974), the [J.C. Taylor Nature Centre](#) (1978) and the [R.J. Hilton Centre](#) (1988) were opened.



Over the past half-century, The Arboretum has grown in reputation as a place to learn about, research, and protect the natural environment. The Arboretum's various conservation, education, and research programs have allowed both the public and the academic community to engage with and learn about the natural world.

Aerial view of The Arboretum, 2004

Henry Hock



Henry Hock was one of the most influential employees in the history of The Arboretum. Henry was born in 1951 in Sarnia, Ontario and possessed a strong love for nature from a young age. He later moved to Guelph to pursue a degree in Horticulture at the University of Guelph. After completing his degree in 1977, Henry stayed connected to the university as an Interpretive Horticulturist at The Arboretum.

As an Interpretive Horticulturist, Henry was responsible for maintaining and developing The Arboretum's plant collections. This meant that Henry grew plants from seeds, cared for them in the nursery for 6 to 10 years, and later planted them in The Arboretum. He also designed many of The Arboretum's collections. The expert care and knowledge that Henry provided ensured that many plants, trees, and collections became well-established parts of The Arboretum today.

Henry's passion for the environment and conservation spurred him to initiate [the Elm Recovery Project](#) in 1998. This project was designed to promote and aid in the recovery of the white (American) elm (*Ulmus americana*) population after it was decimated by Dutch elm disease. This project received a large

amount of attention because of its success and use of citizen science. Henry later won the Governor General Award for Forest Stewardship (1998), the Forest Stewardship in Canada Award (1999), and the Bonnie McCallum Environmental Award (2003) for his hard work and dedication to White Elm conservation.

Alongside his work at The Arboretum, Henry co-founded Hillside Festival, an annual arts festival held in Guelph, Ontario. He was the site manager and planted many trees on the island that Hillside Festival is held, ensuring the restoration of the ecosystem and shade for future festival-goers.

After being diagnosed with brain cancer in 2004, Henry passed away in 2005 at the young age of 53. His legacy lives on in The Arboretum in a variety of ways. For instance, the Henry Hock Tree Recovery Endowment was gifted to The Arboretum to continue Henry's work on the Elm Recovery Project. A new greenhouse was also dedicated to Henry, bearing the name of the Henry Hock Propagation Centre.

<https://www.arbhistory.uoguelph.ca/>

Appendix. Zavitz 1905 annual report on OAC Woodlots, Plantations and the Tree Nursery

College Woodlots.

There are four woodlots on the College property, only one of which is near normal condition. The other three are in a very bad state, owing to pasturage and lack of protection. In these woodlots there is practically no reproduction, and the stand is composed of over-mature and defective trees with considerable undergrowth of iron wood. Sugar maple, cherry, basswood, rock elm, and soft elm compose the greater part of the stand in these woods.

The fourth woodlot, which lies at the northern end of the farm, is in better condition than the others (*Victoria Woods*). The soil has a good cover of leaf litter and vegetable mould upon it, and reproduction will take care of itself wherever allowed to enter. This stand is composed of soft elm, soft maple, white cedar or arbor vitae, yellow birch, hemlock, white pine, balsam fir, beech, sugar maple, and cherry. Improvement work is being done in these woodlots along practical lines. Spruce hedges are being placed about the boundaries, to give protection from winds, thus approaching more nearly forest conditions. Such conditions are very hard to obtain in hardwood areas of such small extent as the average woodlot. It is hoped by this border protection to obtain good tree growth over the entire area, whereas the usual woodlot has its borders full of grass and is in very poor condition for reproduction. A very large percentage of the trees in these woodlots are defective or overmature. These trees are being gradually removed and will be utilized as firewood and lumber by the other departments at the College.

College Plantations.

There are four plantations and a few clumps of trees, which were planted about twenty-five years ago. The nursery stock used in making these plantations was to a large extent composed of exotic species, and are of value in showing their adaptability to this climate and location.

A small plantation of Black Walnut, made in 1880, has acquired a height growth of about twenty-five feet and a diameter growth of about six inches. (*located where the stadium is now*) This plantation illustrates the mistake of planting black walnut in pure stands, without the protection of more densely foliaged trees. It is subject to winds and so much light reaches the soil that grass has taken full possession.

In 1887, a plantation of European Larch was made to hide an old gravel pit from public view. These trees were planted in coarse gravel containing very little mineral soil and a spot which would be of small value for field crops.

In 1887, a plantation of mixed hardwood, (*Brown's Woods*) with a border of conifers, was made to hide another gravel pit. The coniferous border is composed of Norway Spruce, larch, and Austrian pine, the greatest part being of Norway Spruce.

In connection with the above plantations, it might be well to mention one made about the same time and located on the brow of the hill to the southwest

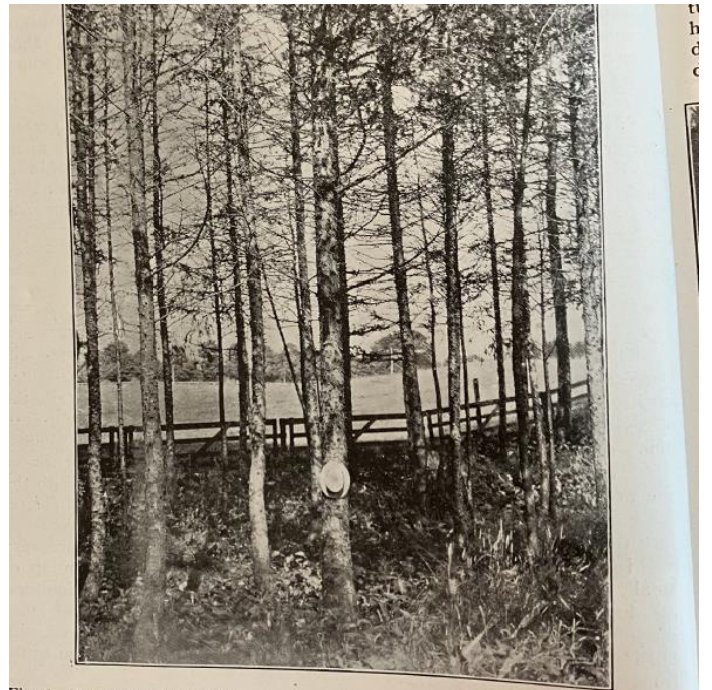


Fig. 9—Twenty-five year old Larch plantation, covering the site of an old gravel pit.

of the College buildings (*Dairy Bush*). I mention these as a whole, because they are of about the same age, and are chiefly composed of exotic species. These two plantations are composed of the following species : Norway spruce, scotch pine, Austrian pine. European larch, Norway maple, sycamore maple, sugar maple, Scotch elm, English oak, burr oak, catalpa, black cherry, European ash, black walnut and butternut .

These plantations cannot be considered of great value from the standpoint of wood production. Wide planting has given low scrubby trees and exotic species are in most cases inferior to our native trees. However, these plantations are of value from the experimental and educational standpoint.

The only exotic species that seem to rank with our native trees, in general development, on this site, which is for the most part gravel formation, are Norway spruce, European larch, and perhaps Scotch pine. This last species would probably have made better growth if closer planting had been followed. The larch has thus far made the best growth, and it is to be hoped that the enemies of the saw-fly will soon end its destructive work. Of the exotic broad-leaved species, none have shown results that would make them preferable to our native hardwoods. However, these conclusions are only for this soil and location and would not warrant a final opinion.

A clump of trees composed of American or soft elm and ash-leaved maple was planted about 1882 in a low lying part of one of the fields and is worthy of mention (*Wild Goose Woods*). They have made a splendid growth of from thirty to thirty-five feet in height and afford good shelter for the stock. This past summer the surrounding field has been pastured, and during the hottest part of the day the cattle invariably- sought the shade of the clump. Such planting made on dairy farms and in permanent pastures would undoubtedly pay for time and space given them.

College Nursery.

In the spring of 1904, a Forest Nursery was established at the College on ground north of the Macdonald Buildings. This land was underdrained and nursery plots and beds at once commenced. The soil of this



vicinity was not suitable for coniferous nursery work, but the location was used until a more suitable situation could be found. This spring extensive seed beds were made for white pine, white ash, locust, red oak, hickory, elm, and black cherry. There is in the nursery at present, one year old seedlings, about seventy-five thousand white pine, fifty-thousand soft or American elm, ten thousand white ash, six thousand red oak, ten thousand black locust, twenty thousand white wood, ten thousand red maple, and five thousand of species as black cherry, shag-bark hickory, white maple, and English elm.

Of two year old material, there is about eight thousand transplants of white ash, eight thousand transplants of soft elm, two thousand seedlings of Norway spruce, and five thousand seedlings of European larch. Besides the above, there is a mixture composed of three hundred white pine five years old, four thousand Norway spruce five year old, and other species in nursery lines, which are to be used in experimental and

decorative work on the College property. This ground is suitable for hardwoods, but we have lost many white pine seedlings through a "damping off" fungus, which is usually more troublesome on heavy soils. Another nursery site has been secured on the Holmwood* (*sic*) property, northwest of the city of Guelph. This location is within easy access of the city and College. It is also well protected from northerly winds by a slight ridge, has a soil of sandy loam, with a sandy subsoil, and is on the bank of a small stream, which ensures a water supply.



* Homewood Health Centre is one of Canada's foremost mental health treatment facilities. It is located in a 50 acre setting along the Speed River.

From Zavitz 1905 report to Ontario Agriculture College

References

Reference not complete.

All old photos attributed to E. J. Zavitz but obtained from various sources