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Résumé de l'article

Les premiers colons dans le sud de l'Ontario aspiraient à devenir des agriculteurs possédant des terres prospères. Ils ont commencé par la coupe d'arbres. En l'espace de quelques décennies, et en l'absence d'un couvert forestier pouvant les entraver, le vent et l'eau dévastèrent le sol et les cultures. Les agriculteurs furent encouragés à reboiser leurs terres par des groupes tels que la Ontario Fruit Growers' Association. La foresterie rurale, dans le cadre de l'agriculture scientifique, connut un début rapide dans les années 1900 avec la Ontario Agricultural and Experimental Union, mais ce mouvement fut mal supporté jusqu'à ce que dans les années 1930, la relation entre la déforestation et l'approvisionnement en eau atteignit un point de crise. La Ontario Conservation and Reforestation Association (OCRA) et la Ontario Crop Improvement Association (OCIA) furent en 1937 et 1938 après un été sec et désastreux. Chaque organisation interpréta la conservation des ressources naturelles de façons profondément différentes : l'OCRA comme un mouvement pour créer des ressources forestières sur le domaine public, et l'OCIA comme un mode de gestion des terres agricoles privées pour améliorer la production des cultures.

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Farm Forestry in Agricultural Southern Ontario, ca. 1850-1940: Evolving Strategies in the Management and Conservation of Forests, Soils and Water on Private Lands

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Abstract: Early settlers in southern Ontario aspired to become prosperous land-owning farmers; they began by cutting trees. Within a few decades, wind and water, unimpeded by forest cover, devastated soil and crops. Farmers were encouraged by groups such as the Ontario Fruit Growers' Association to reforest some of their land. Farm forestry, as part of scientific agriculture, had a strong beginning in the early 1900s with the Ontario Agricultural and Experimental Union, but that movement was poorly supported until the 1930s, when the relationship between deforestation and water supplies reached a crisis. The Ontario Conservation and Reforestation Association (OCRA) and the Ontario Crop Improvement Association (OCIA) were created in agricultural southern Ontario in 1937-8 after a disastrously hot dry summer. Each organization interpreted the conservation of natural resources in profoundly different ways: the OCRA as a movement to create forest resources on public property, and the OCIA as management of privately-owned farmlands to improve crop production.

Abstract : Les premiers colons dans le sud de l'Ontario aspiraient à devenir des agriculteurs possédant des terres prospères. Ils ont commencé par la coupe d'arbres. En l'espace de quelques décennies, et en l'absence d'un couvert forestier pouvant les entraver, le vent et l'eau dévastèrent le sol et les cultures. Les agriculteurs furent encouragés à reboiser leurs terres par des groupes tels que l'association des producteurs de fruits de l'Ontario. La foresterie rurale, dans le cadre de l'agriculture scientifique, connut un début rapide dans les années 1900 avec l'union agricole et expérimentale de l'Ontario, mais ce mouvement fut mal supporté jusqu'à ce que dans les années 1930, la relation entre la déforestation et l'approvisionnement en eau atteignit un point de crise. L'association de conservation et reboisement de l'Ontario (OCRA) et l'association d'amélioration des cultures de l'Ontario (OCIA) furent en 1937 et 1938 après un été sec et désastreux. Chaque organisation interpréta la conservation des ressources naturelles de façons profondément différentes: l'OCRA comme un mouvement

pour créer des ressources forestières sur le domaine public, et l'OCIA comme un mode de gestion des terres agricoles privées pour améliorer la production des cultures.

Introduction

The history of forest management on farms in agricultural southern Ontario, sometimes referred to as Old Ontario, is deeply rooted in beliefs held by British immigrants who arrived with fervent hope for a prosperous future for themselves and their families, and a will to “possess and manipulate land”¹ according to the rights and responsibilities granted them as private landowners. The influx of prospective farmers began in the late eighteenth century and continued until the third quarter of the nineteenth century. By this time, except for the north, also called New Ontario, and a few interior frontiers, farm-making in Ontario was essentially complete. Almost without exception, settlers had hastened to cut down as many trees as possible and change the landscape from native forest to improved field.²

The economic philosophy that privately-owned land was intrinsically valuable to a government to sustain progress and power, through occupation by individual landowners, was brought to bear on these new farmers who applied private initiatives to improving their holdings for self-provisioning (themselves, their families and livestock) and, if surplus products were available for sale or trade, participation in commodity markets. Improved land was thus a source of private wealth and public stability in a region such as southern Ontario, where agriculture promised generous returns on investments of capital and labour. Historian Catharine Anne Wilson argues that the ownership of land was fundamental to nineteenth century liberalism: it implied a commitment to community and state, but it also confirmed a settler’s right to manage property as he saw fit to support himself and his family.³

¹ John C. Weaver, *The Great Land Rush and the Making of the Modern World, 1650-1900* (Montreal & Kingston London Ithaca: McGill-Queen’s University Press, 2006), 24.

² Landscape architect Owen Scott points out that Mennonites arriving in Waterloo county to make farms in the early 1800s took a different approach to deforestation, retaining forested areas for harvesting valuable specimens and also for activities such as maple sugaring. These were purely pragmatic; Mennonites were not romantic in their assessment of forest value. Owen R. Scott, “Utilizing History to establish Cultural and Physical Identity in the Landscape,” *Landscape Planning* 6 (1979): 187.

³ Catharine Anne Wilson, *Tenants in Time: Family Strategies, Land, and Liberalism in Upper Canada, 1799-1871* (Montreal & Kingston London Ithaca: McGill-Queen’s University Press, 2009), 4-9.

The prosperous farms envisioned by officials and settlers in southern Ontario were only to be had by relentless hard work. Private property rights ensured that farm makers and farmers were able to take steps they deemed necessary, without bureaucratic intervention, to increase yields of food and feed in the short term.⁴ The long term was a different story, however; the removal of forests precipitated many unforeseen environmental problems which rendered the rural countryside inhospitable to agriculture, especially field crop production. Without trees, the annual flows of several extensive riversheds draining southern Ontario were disrupted, and alternating floods and droughts ensued. Wind blew away the soil, and blowing snow played havoc with crops and livestock. Nevertheless, decades passed before the situation became critical, and by the 1930s, farmers took serious action to reverse the damage done by deforestation.

In the 1930s, the intellectual concepts of an ecosystem, and the new science of ecology, were virtually unknown in agricultural southern Ontario.⁵ Neither did sustainable agriculture, a term which has gained currency in Canada only since the 1950s, exist formally as a philosophy of farming; agricultural environmentalist Rod MacRae argues that the sustainable agriculture movement was founded in Canada in the early 1950s with the formation of The Land Fellowship. The greatest emphasis of this movement was a dynamic soil ecosystem.⁶ During the 1930s and 1940s, O.M. McConkey, Professor of Field Husbandry and forage and grassland specialist at the Ontario Agricultural College (OAC), taught the value of hay and pasture crops for building up soil organic matter to increase soil fertility and stability over the long term. Agricultural science validated informal knowledge about soil management and land use that farmers had used and shared for generations.⁷

The contemporary conservation movement recognized the interdependence of humans and their environment, and contained the principles of ecology, or the interdependence of organisms, applied to a rural/agricultural ecosystem. Rural people, including farm families, participated in conservation activities, such as tree planting along

⁴ Weaver, 11-45, 81-84.

⁵ Anna Bramwell, *Ecology in the 20th Century: A History* (New Haven and London: Yale University press, 1989). Bramwell argues that the modern ecological movement emerged from economics and biology, and began primarily as a political movement in Europe in the late nineteenth century.

⁶ Rod MacRae, "A History of Sustainable Agriculture", *Ecological Agriculture Projects*, http://eap.mcgill.ca/AASA_1.htm. Accessed August 22, 2014.

⁷ O.M. McConkey, *Conservation in Canada* (Toronto, Vancouver: Dent & Sons, 1952). In this book, written after he retired, McConkey connects conservation of soil, water, and other natural resources with agricultural practices around the world.

roadways, but reforestation on private property was feasible as long as it could coexist with the business of crop production for family income and prosperity.

By looking at the words and actions of working farmers and rural leaders (including prominent farmers, politicians, agricultural scientists and foresters), I will argue that forest management on private property in southern Ontario was of limited interest until economic and environmental crises in the late 1920s to mid-1930s forced public and private landowners to organize remedial action for the comprehensive management of forests, soils, lands and water. In 1938, without controversy or drama, two separate groups were formed: the Ontario Crop Improvement Association (OCIA) and the Ontario Conservation and Reforestation Association (OCRA.) Despite a common awareness by these groups that an ecosystem approach to rural natural resource conservation was essential if damage caused by deforestation was to be reversed, a fundamental philosophy of private property ownership persisted as farmers applied science and experience to individual farm management.

Early agriculture in southern Ontario; a period of property possession and manipulation

Southern Ontario is a region of diverse climate and geography; farmer settlers were an equally diverse group. For instance, geographer Kenneth Kelly, whose wide-ranging research on changing attitudes of settlers to features of the rural Ontario landscape provides considerable context for this essay, sets a cohort of “improving farmers” apart from the vast majority of individuals who, he claimed, “sought the greatest immediate profit from a very small investment of labour and capital” during the second quarter of the nineteenth century. This group of improvers, many of whom were half-pay British soldiers and their families, arrived with initial capital and regular off-farm income. These assets financed a type of mixed farming that integrated relatively large herds of high quality livestock with feed crops (grain, roots, and legumes) cultivated in scientific rotations. As Kelly’s improving farmers cleared land in small increments they established pastures and hayfields as an alternative to the general practice of chopping down trees and sowing grain. Such a system was both labour and capital intensive, and many inexperienced mixed farmers failed. Their legacy included ideas about livestock breeding, seed selection, and soil fertility, which they introduced to contemporary agricultural societies.⁸

⁸ Kenneth Kelly, “Notes on a Type of Mixed Farming Practised in Ontario during the Early Nineteenth Century,” *Canadian Geographer* XVII, 3 (1973): 205-219.

Wholesale clearing was more the norm, and is discussed in numerous works by Kelly and others. Indeed, geographer Helen E. Parson argues that ongoing debates about the relationship between deforestation and agriculture, until at least the turn of the twentieth century, were “largely an academic exercise” carried on in the public forum by agricultural journals and published government reports. There was no legislation to restrain private landowners who would “denude the lands of wood if their immediate interests seem to point in that direction.” In the first half of the nineteenth century, farming and lumbering were symbiotic, as farmers logged their own lands, and many built primitive sawmills.⁹ By 1874, editors of *Farmer’s Advocate* concluded cynically that if “discretion will not teach them, probably no law intended to check the stripping of private lands of woods would be of any use.” In fact, the Ontario Tree Planting Act (1883-1886) funded trees planted and still alive after three years at twenty-five cents per tree, but the subsidy applied to roadways, where wind and snow interrupted traffic. It did not apply to woodlots and fields, where farm income was most adversely affected by the lack of cover.¹⁰ What farmers did to make a living from their land was understood to be their own business.

In reality, most settlers needed to cover the costs of farm-making and purchase family necessities as soon as possible. Moreover, their unfamiliarity with the climate and topography of Ontario, including forest cover which often indicated soil type, led them to see trees not poetically, as a dark and gloomy presence (as Susannah Moodie famously described them¹¹.) but objectively, as a crop of timber, ashes, fuel and construction materials, already planted, grown to maturity and available for harvest, personal use and sale. Thus between 1840 and 1887, over sixty per cent of the Trent River watershed was cleared for cultivation.¹² By 1884, rapid clearing in Simcoe County had already led to shortages of firewood and building timber.¹³ Approximately seventy-five to eighty per cent of forest cover had been stripped from townships along Lake Ontario and further

⁹ R. Peter Gillis and Thomas R. Roach. *Lost Initiatives: Canada’s Forest Industries, Forest Policy and Forest Conservation* (New York Westport, Connecticut London: Greenwood Press, 1986), 1-30.

¹⁰ Helen E. Parson, “Reforestation of Agricultural Land in Southern Ontario before 1931,” *Ontario History* 86, 3 (1994): 237, 239; *Farmer’s Advocate* (hereafter *FA*) (1874), 129-130.

¹¹ Susannah Moodie, The Project Gutenberg eBook of *Roughing it in the Bush*, by Susanna Moodie. http://www.gutenberg.org/files/4389/4389-h/4389-h.htm#link2H_4_0003. Accessed April 12, 2014.

¹² *FA* (1887, February), 37-38.

¹³ Kenneth Kelly, “The Changing Attitude of Farmers to Forest in Nineteenth Century Ontario,” *Ontario Geography* 8 (1974): 72.

inland by about 1891.¹⁴ The process was most damaging when it occurred in a rivershed, where trees ensured a slow spring runoff and the replenishment of ground water. The lands irrigated by several southern Ontario river systems were deforested early and damaged almost beyond recovery by resulting floods and droughts.

The Grand River and its network of tributaries is an important system that originates in the Luther Marsh in the high altitudes of Dufferin County in south-central Ontario and flows in a south west direction to Port Maitland on Lake Erie. During early settlement, land was cleared and many small sawmills were constructed. Cedar flourished in the marsh, and an excellent market existed for cedar fencing. In the 1880s, cedar rail fences were typically five rails high, set in posts twelve feet apart, and cost \$1.50 per acre enclosed. The immediate cost of fencing crops and orchards, mainly against wandering cows, accrued to farmers who purchased the rails, and was a saving and an income to farmers who harvested cedar. When the tangle of evergreen limbs which had efficiently held snow and retarded spring melt until it could percolate into the soil and gravitate slowly downstream as rivers and ground water was gone, the river overflowed its banks all the way to Lake Erie, a distance of almost 300 kilometres. Moreover, the marsh soil was unfit for cropping, and farms and mills established there were abandoned when the forest was gone. In his history of the Grand River Conservation Commission (predecessor of the Grand River Conservation Authority), geographer Dan Shrubsole describes spring floods followed by summer droughts, when occasional torrential rainstorms raised the river level to normal. The erratic rise and fall played havoc with urban and rural sewage disposal, and the river was often a stinking mess in the summer. This continued until 1912, when the Grand River Improvement Association initiated action to control annual flow by erecting a series of dams and reservoirs along the river.¹⁵

The Trent River flows from Rice Lake to Lake Ontario at the Bay of Quinte. The Trent itself is only 90 kilometres long, but it drains an extensive area in southeastern Ontario, including the Kawartha Lakes. This area was intimately familiar to Thos. Beall of Lindsay, whose father purchased a “wooded farm” near Whitby in 1840. Beall himself lived close to that home farm for at least forty-six years, and witnessed a

¹⁴ Kenneth Kelly, “Damaged and Efficient Landscapes in Rural and Southern Ontario 1880-1900,” *Ontario History* LXVI, 1 (March 1974): 2.

¹⁵ Stephen Sawden, *History of Dufferin County* (Orangeville, Ontario: Orangeville Banner, 1952). <http://www.ourroots.ca/e/page.aspx?id=1082794>. Accessed April 12, 2014.; *Report of the Fruit Growers' Association of Ontario for the Year 1882* (Toronto: 1883), 26-27 (hereafter *FGA Report*); Dan Shrubsole, “The Grand River Conservation Commission: History, Activities, and Implications for Water Management,” *The Canadian Geographer* 36, 3 (1992): 222-226.

“wonderful change” in the land: unbroken forest and wild animals had all but disappeared, replaced by “smiling fields of grain and beautifully undulating pastures, stocked with the finest breeds of sheep, cattle and horses – the whole country dotted here and there with towns and villages, and excellent farm buildings may be seen on every hand.”¹⁶ He was an enthusiastic proponent of the rights of landowners to manipulate their property by domesticating indigenous lands for profit and aesthetic enjoyment that conformed to contemporary norms of squared fields and linear roadways.¹⁷ Yet Beall admitted in a prize-winning essay published in 1887 that all was not well in the Trent River valley, and farmers themselves were to blame. Substantial losses and inconveniences impinged on the very personal property rights that they had claimed when they cleared. In summer, crops suffered from droughts which often lasted two to three weeks. In winter, travel was impeded by blowing and drifting snow, so that impassable roads were often re-directed across open fields at serious loss to the landowner. Surface draining by building ditches and running furrows through fields, necessary as springs and small streams dried up and spring runoff and summer rains ran freely, also cost time and money. Beall’s specialty as an orchardist, and his opinion that re-forestation to reduce wind was more critical than drainage to stabilize water flow, led him to join the Fruit Growers’ Association of Ontario (FGAO) and serve as director for Division 5, Lindsay, for many years.¹⁸

Through the FGAO, like-minded men (including Beall and William Saunders, who served both as Director, District 11, London, and President, 1882-1886), aimed to “carefully instruct the farming community how much depends on the judicious plants, forest trees.”¹⁹ In 1882 Saunders, in a paper submitted to the Royal Society of Canada, recommended stricter regulation of cutting, and predicted dire consequences for the country if replanting programs were not implemented.²⁰ The FGAO recognized the necessity of preserving and replanting forests in general, especially “forest clumps” for shelter and ornament. They were increasingly concerned with trees as living fences,

¹⁶ *FA* (1887, February), 37-38.

¹⁷ For a discussion of the British “gridiron” survey system, and how it determined the layout of most of rural southwestern Ontario to the late 1900s, see Scott, 179-203. See also R. Louis Gentilcore, “Canada in the Nineteenth Century” in *Historical Atlas of Canada. Vol. II. The Land Transformed 1800-1891*, ed. R. Louis Gentilcore (Toronto Buffalo London: University of Toronto Press, 1993), 5, and Marvin McNinnis and Peter J. Usher, “Canada, 1891” in *Historical Atlas of Canada. Vol. II.*, Plate 5.

¹⁸ *FA* (1887, February), 37-38; *Ibid*, 39.

¹⁹ *FGA Report 1879*, 3.

²⁰ William Saunders, “On the importance of economizing and preserving our forests,” *Transactions of the Royal Society of Canada*, Section IV (1882): 35-37.

which required no maintenance or repair. They promoted the preservation and management of indigenous stands of specialty trees (black walnut, butternut, cedar) as commercial crops.²¹ But the interests of FGAO members lay primarily in fruit trees and production of fruit and seedlings, and their reports turned increasingly to themes of horticulture.

By 1905, mixed farming was widespread in agricultural southern Ontario; except for the Niagara Peninsula, which was topographically and climatically well-suited to growing tender tree fruit crops, the majority of farmers began to raise feed and food crops in association with some kinds of livestock.²² Winter wheat (also referred to by some authors as fall wheat) has received much scholarly attention since economist Harold Innis developed his staples theory, and claimed that winter wheat was a staple crop grown by virtually all settlers as soon as they had cleared some open space; the harvest was all sold for shipment to British markets.

In his recent overview of agricultural settlement in Ontario, Quebec and the Prairie provinces, historian Peter A. Russell dissects the historiographic debates on the place of winter wheat in early Ontario. There is no doubt that winter wheat was a significant field crop, and in fact winter wheat is still widely grown in Ontario in the twenty-first century. The reasons for winter wheat's decline, and the switch to systems of mixed farming, are complex.²³ One very plausible first-hand rationalization was winter kill of entire stands from lack of standing timber which would have sheltered them. Without a forest on the windward side of a wheat field, cold winds swept away snow cover and desiccated naked seedlings or left them exposed to mid-winter freeze/thaw cycles which inevitably heaved them out of the soil and killed them.²⁴ Farmers and farm families turned to a variety of annual feed crops and more animals to stabilize their diets and incomes, as more land was cleared of stumps and domestic markets for food expanded. Winter wheat became part of a variable rotation of annual grains and roots, perennial pastures and hayfields, and household orchards and gardens.

To a lesser extent, winter conditions also affected perennial clovers and grasses, and the introduction of hardy alfalfa to Ontario in the late 1800s was another advantage to mixed farming. The specific crops and livestock raised in this system depended almost entirely on the environmental attributes of the farm, and the research and experiments conducted at

²¹ *FGA Report 1879*, 3; *FGA Report, 1882*, 26-27, 165; *FGA Report 1883*, 230-231.

²² See Patricia Bowley, "Ontario Agriculture in the 1910s: The Move Toward Regional Specialization in Crop Production," *Scientia Canadensis* 20 (1996): 100-121.

²³ Peter A. Russell, *How Agriculture Made Canada: Farming in the Nineteenth Century* (Montreal & Kingston London Ithaca: McGill-Queen's University Press, 2012), 96-141.

²⁴ *FA* (1887, February), 39.

OAC, especially by the Department of Field Husbandry, were devoted to the introduction and development of food and feed crops adapted to various growing regions in agricultural Ontario.

Scientific agriculture and farm forestry at OAC

In 1899, the *Final Report of Ontario's Royal Commission on Forestry Protection* reiterated the recommendations from public and private sources that had been circulating for decades: farmers must return their poorer soils to forest. The report endorsed government aid for forest management, and one of the first steps taken in this direction was the hiring of forester E.J. Zavitz²⁵ in 1904 to establish a small forest nursery at OAC to raise seedlings for free distribution to farmers.²⁶ In 1905, however, the new Conservative government of James Pliny Whitney transferred the Bureau of Forestry from the Department of Lands and Forests to the Department of Agriculture.²⁷ This signaled that government support was not forthcoming for scientific forestry, also called silviculture and defined as “a rational system of forestry intended to ensure proper harvesting of existing stands of timber and to provide a perpetual source of income for the province” and legislated in Ontario's Forest Reserve Act of 1899 by the Liberal government of George William Ross.²⁸ This move also effectively placed forestry under the umbrella of scientific agriculture. Farm forestry would henceforth be offered as part of the curriculum of the Department of Field Husbandry, OAC. As such it would

²⁵ Edmund J. Zavitz and Charles A. Zavitz are not to be confused one for the other; they were both very important agents in the history of Ontario agriculture. Edmund J. Zavitz (1875-1968) was a professional forester, nicknamed “the father of reforestation in Ontario” for his work over a half century; see John Bacher, *Two Billion Trees and Counting: The Legacy of Edmund Zavitz* (Toronto: Dundurn, 2011). Charles A. Zavitz (1863-1942), a distant cousin of Edmund, was an OAC alumnus employed by the Department of Field Husbandry from 1887-1927. He worked closely with co-operative members of the Ontario Agricultural and Experimental Union to select suitable field crops for Ontario, including alfalfa, oats, barley, potatoes and soybeans. See Patricia M. Bowley, “A Century of Soybeans: Scientific Agriculture and Mixed Farming in Agricultural Southern Ontario, 1881-1983”, unpublished PhD thesis, University of Guelph, 2013, and Laura Quirk, *Dr. Charles Ambrose Zavitz: Agriculturalist, Experimentalist, Professor and Friend* (University of Guelph: Guelph, 2004).

²⁶ Mark Kuhlberg, “Ontario's Nascent Environmentalists: Seeing the Forest for the Trees in Southern Ontario, 1919-1929,” *Ontario History* LXXXVIII, 2 (June 1996): 122.

²⁷ Mark Kuhlberg, *One Hundred Rings and Counting: Forestry Education and Forestry in Toronto and Canada, 1907-2007* (Toronto Buffalo London: University of Toronto Press, 2009), 11-32.

²⁸ Gillis and Roach, 90.

be subsumed in the philosophy of most agricultural scientists, rural leaders, and farmers of the time: improved crop kinds and varieties for increased yields, by bringing as much land as possible into production. As long as forest products could not compete with field crops as a source of farm income, farmers and agricultural scientists assigned them at best a minor role in farm management.

Despite the general bias against farm forests, it was farmers themselves who made the first move in introducing forestry to scientific agriculture: OAC alumni, who had graduated from the two-year diploma program offered by OAC, as well as the few who were graduates of the four-year Bachelor of Science in Agriculture (BSA) degree program granted by the University of Toronto to students who successfully completed the requirements at OAC. These innovators belonged to the Ontario Agricultural and Experimental Union (the Ag Union), an organization originally formed in 1879 by early graduates who wished to enhance their education by meeting with other alumni and staff to discuss and exchange information pertaining to agriculture. By 1892, the Ag Union had evolved from a discussion group (unsatisfactory to members) to an active participant in experiments designed and analysed by C.A. Zavitz, Professor of Field Husbandry. Although the membership numbered some 120 in the first year, only OAC alumni were ever admitted.²⁹ So while this was always a very small proportion of active farmers in Ontario, it is safe to assume that the information they collected and published in their *Annual Reports* was disseminated to many others at business meetings and social occasions.

The Ag Union launched its co-operative work on farm forestry in 1900 with the following recommendation from the President, farmer H.R. Ross, BSA, of Gilead, Ontario:

The work of this Union continues to expand. ... The reduction of our forest areas is becoming a source of menace to our farmers. The periodic and protracted drouths are not to be lightly regarded. The question of fuel supply by no means ends the matter. By applied forestry in its truest sense a great deal could doubtless be accomplished in husbanding our present supply, but there are areas of varying size on every farm which could advantageously be employed in providing for the wood lot of the future. These areas, along with the wind breaks and shelter belts, would materially reduce the risk from destructive winds and excessive drouths. This at once raises the question of what trees to set for

²⁹ *Sixth Annual Report of the Ontario Agricultural College and Experimental Farm, for the year ending 31st December, 1880*. Toronto: 1881, 97-99 (hereafter *OAC Report*); *Fourteenth Annual Report of the Agricultural and Experimental Union, 1892*. Toronto: 1893, 283-288 (hereafter *Ag Union Report*).

this purpose, and what varieties make the quickest, hardiest, or densest growth, or are best adapted to high or low lands, or whether native or imported trees are best calculated to serve our ends? Obviously, we are without accurate or specific data. This matter of forestry is bound to become a problem in this Province just as that of seed selection has done. This Union, by its co-operative tests, made the seed problem easy of solution by beginning in time and making good use of its results. The same has been and is being done in other lines. May we not make forestry our next step in this work of investigation.³⁰

To this end, a Committee on Forestry (CF) was struck, adding to existing Committees on Agriculture, Horticulture, Economic Botany and Entomology, and Poultry.

The first official act of the CF was to send a set of 18 questions, all concerning woodlots, to Secretaries of Farmers' Institutes, and to make two recommendations when the questionnaires were returned and compiled. The first was the creation of a system of experimental woodlots throughout rural Ontario, on land to be donated and managed by Ag Union members for co-operative experiments on regeneration, species comparisons, thinning and pruning, and to be inspected annually by the CF to ensure that the woodlot was not cut or pastured.³¹ By 1911, the CF had identified a serious problem with the farm forestry experiments: co-operating farmers were not making improvements to their woodlots, and indeed were clearing the land for agricultural purposes. Two years later, the CF noted "little change during the past five years in the percentage of woodlots in the province, but there is certainly a gradual change for the worse in the quality of the woodlot." Unlike the co-operative experiments on crop improvement run by C.A. Zavitz, farm forestry experiments were not popular and did not return results which were useful to the farming population. OAC President George Creelman stated pragmatically at the annual meeting in 1911, "In this forestry matter we are striking practically a new field, and it cannot be expected that we can make very much progress individually in getting men to give up land for reforestation."³²

In fact, it was not a new field. For decades, farmers had chosen to pay lip service to farm forestry, or to ignore it altogether, even in the face of the serious environmental and economic damage which deforestation caused, including but not limited to those discussed earlier in this essay. OAC hired E.J. Zavitz as Lecturer in Farm Forestry in 1905, following his

³⁰ *Ag Union Report 1900*, 10-11.

³¹ *Ag Union Report 1902*, 34-37.

³² *Ag Union Report 1911*, 54-55; *Ag Union Report 1913*, 52.

graduation from the University of Michigan with an MSc in forestry, a position he held until 1912. Creelman did not understand that the exclusive focus on scientific agriculture at OAC, an institution respected by the entire agricultural community, was not compatible with woodlot improvement as long as trees were not a profitable crop. In the face of decisions about private property use, educated farmers opted for shorter term yield increases by planting annual crops.

The second recommendation made by the CF of the Ag Union was the establishment of a forest nursery at OAC by the provincial government, and an annual stipend for its maintenance. In response to this request, the Minister of Agriculture, John Dryden, hired E.J. Zavitz (before he left for Michigan) in the summer of 1904. The program was an immediate success. Zavitz quickly set up two separate nurseries, one each for hardwoods and softwoods, to provide the different growing conditions required by each type. Beginning in the summer of 1905, he began sending out thousands of free seedlings, on request to farmers, with all costs and labour to be supplied by the landowner. Some of the most popular were Norway Spruce, White Pine, White Ash, Hard Maple, American Elm, Black Locust, and Tulip Tree. The popularity of the program initiated a series of provincial Forest Stations in Norfolk County, at St. Williams and Normandale (1908 and 1924 respectively), Simcoe County at Midhurst (1922), and Northumberland and Durham Counties at Orono (also in 1922). In 1908, the OAC nursery moved permanently to St. Williams.

The actions of the Ag Union and the Departments of Agriculture and Lands and Forests which eventually took over administration of the Forest Stations bore some fruit. Census data comparing area of farms as woodland 1911 and 1931 revealed a significant increase over the 20 years between enumerations in some areas, mainly where farmland was poor for field crops. In 1911, 7.6 percent of farmland in selected townships was wooded, but by 1931, this area had increased to 9.1 percent; analysis showed this increase to be statistically significant, and attributable to various reforestation programs. The effect was most pronounced in Essex and Kent Counties, where the Thames River was notorious for spring flooding; in Lambton and Huron Counties, on the west coast; and especially in Norfolk County where sandy soil would not support field crops. Farmers in Norfolk County were closest to demonstration forests at the two Forest Stations, and could see first-hand the value of reforesting, and it is possible that they picked up their seedlings to avoid paying postage. Townships in prime agricultural areas, such as central Ontario and the Niagara Peninsula, did not exhibit the same trend to increased

reforestation, likely because the land there was considered too valuable for forest trees.³³

Arguably Zavitz's most astute observation when he was reporting to the Ag Union as member of the CF was to delineate two classes of lands suitable for reforestation in southern Ontario: small isolated patches throughout otherwise good farm land, where reclamation would depend on local, often private, initiative, and large contiguous areas which could only be effectively reclaimed through state management.³⁴ Thus in his *Report on the Reforestation of Waste Lands in Southern Ontario*, published in 1908, he advised that where they existed, denuded and unimproved soils, mainly sand, gravel, rock formations and steep hills were waste soils and should not be cropped, and that they should be reclaimed as woodland by the farmer-landowner.³⁵ The recommendation was taken seriously, and the demand for trees increased steadily from about a half million in the first few years of the program, to almost two million in 1924 and almost six million in 1930. Nor was the Department of Lands and forests heavy-handed or doctrinaire in its advice to farmers. For example, the Orono Forest Station in Durham County supplied seedlings to farmers for many years, but the superintendent, G.M. Linton, refrained from advocating trees on any land which would pay more under an agricultural crop. Instead, he emphasised the aesthetic, financial and social benefits of reforestation on both private and public lands for other purposes; he proposed that outdoor activities such as fishing, lumbering, and tourism, which depended on well-managed private and public forests, would augment regional revenues in the region, and strengthen the economic and social aspects of the entire rural community.³⁶ This was an early manifestation of ideas about ecosystems which emerged in the interwar years and steadily gained ground thereafter.³⁷

On public properties, Zavitz's work eventually resulted in the creation throughout the province of Agreement Forests, planted and managed by the province on land purchased by a county. Zavitz and E.C. Drury, a farmer in Simcoe County, were longtime partners in the reforestation

³³ Parson, 243-246.

³⁴ *Ag Union Report 1903*, 38; *Ag Union Report 1904*, 69-70; *Ag Union Report 1906*, 38-44; *Ag Union Report 1908*, 47-50; *Ag Union Report 1911*, 54.

³⁵ Edmund J. Zavitz, "Report on the Reforestation of Waste Lands in Southern Ontario, 1908," in E.J. Zavitz, *Fifty Years of Reforestation in Ontario* (Toronto: Ontario Department of Lands and Forests, 1958), 5.

³⁶ Kuhlberg, "Ontario's Nascent Environmentalists", 127-136; *Ag Union Report 1908*, 47-50; Parson, 243.

³⁷ See Pascal Acot, "Ecosystems", in *The Cambridge History of Science. Vol. 6. The Modern Biological and Earth Sciences*, eds. Peter J. Bowler and John V. Pickstone (New York: Cambridge University Press, 2009), 451-466.

movement; they had sat together on the Committee on Experimental Forestry (CEF) of the Ag Union. In its *Report* in 1911, the CEF credited the non-agricultural areas in the province with the greatest potential for reclaiming and reforesting damaged lands; these were soils that had virtually no potential for cropping, due mainly to natural geography. In 1922 the Counties Reforestation Act (originally passed in 1911) was amended by the United Farmers of Ontario (UFO) government under Drury's leadership to facilitate the creation of municipal or Agreement Forests. During the 1920s, at least 28 counties, with the majority in central Ontario, established at least one Agreement Forest. Simcoe, York and Durham counties each established five or more.³⁸ It remained the prerogative of private landowners to commit to reforesting their own properties, although the provincial government was active in extension work to promote farm forestry to farmers throughout the 1920s.

On the farm

Throughout the 1920s, the Department of Lands and Forests maintained an active interest in encouraging farmers to reclaim "wastelands" as woodlots. Forester A.H. Richardson, colleague of E.J. Zavitz at the Ontario Department of Lands and Forests, prepared two comprehensive bulletins for free distribution to farmers: a how-to manual, "Forest Tree Planting," in 1924, and "The Woodlot," which gave clear instructions for improving and protecting woodlots, in 1923 and reprinted in 1929. In these bulletins, Richardson itemized in detail, and with illustrations of proper equipment and techniques, the benefits of a well-maintained farm woodlot. He listed shelter from wind and sun, habitat for insectivorous birds, prevention of erosion and aesthetic value. As for more tangible returns, he advised that a farmer with a woodlot could expect to harvest firewood and building materials. These pamphlets were intended to complement the free seedling program, which grew to 33 million in 1959, but a census of private plantings revealed that, as of 1949, only a very small percentage of the hardwoods distributed (deciduous trees such as oak, maple and ash) had successfully taken root and grown. With the benefit of hindsight, E.J. Zavitz commented that during those years, farmers got little personal inspection or guidance from forestry officials. Although Richardson's excellent pamphlets were freely available, they

³⁸ *Annual Report of the Ontario Agricultural and Experimental Union* (hereafter *Ag Union Annual Report*), 1911, 8, 54; Mark Kuhlberg, "Ontario's Nascent Environmentalists: Seeing the Foresters for the Trees in Southern Ontario, 1919-1929," *The Forestry Chronicle* 74, 4 (1998): 137-138.

were not enough for the many farmers with no experience selecting, planting and looking after trees.³⁹

E.J. Zavitz's criticisms are vindicated by the frustration expressed in rural communities about the lack of participation in farm forestry efforts by foresters employed by the Department of Lands and Forests. County Agricultural Representatives (Ag Reps) were highly visible and extremely helpful in matters of crop and livestock husbandry and marketing, but no comparable group of extension foresters existed. Watson Porter, editor of *Farmer's Advocate*, attacked the provincial Department of Forestry for ignoring southern Ontario in favour of the north, where "stumpage fees and patronage" were allegedly business as usual in a system which neither lumbermen nor politicians wanted to change. It was not true that southern Ontario was "ignored". The many new municipal forests were funded by the provincial government but managed by the county, for the conservation of soil and water through a region. In effect, farmers benefited indirectly from scientific forestry on public lands. In truth, Porter's editorial reflected a dissatisfaction with government in general. This included a long-standing sentiment that the Dominion government was disproportionately concerned with western Canada, due to lost revenue from reduced wheat sales in the weak export markets of the post-war period. Ontario farmers were thus caught between a rock and a hard place; they were loathe to give up their traditional status as independent producers and private landowners, but by the late 1920s only a concerted communal effort would be enough to turn the tide of agricultural decline caused by unfavourable economic and environmental forces. As Watson Porter stated clearly, farmers were to blame for cutting down too many trees over the years, and farmers would have to repair the damage by putting marginal lands back into forest.⁴⁰

And yet, the main impetus of crop improvement continued to be the application of scientific agriculture for increased yields per acre and acres under cultivation. Indeed, over the 40 years he was in charge of designing and administering co-operative experiments on grain crops with Ag Union members, C.A. Zavitz estimated that exceptional improvements in knowledge and practice on Ontario farms had added over two million dollars to average market prices of these crops. Such improvements were due to the application of the new sciences of plant breeding and genetics to the selection of superior varieties of grasses, legumes, roots, oilseeds and fodder crops, as well as rates and methods of seeding. In all, thousands of individual farmers contributed data for summary reports which were distributed free by the Department of Agriculture. In the mid-

³⁹ E. J. Zavitz, *50 Years of Reforestation in Ontario. Part 2. The Second Twenty Five Years* (Toronto: Ontario Department of Lands and Forests, 1961), 28.

⁴⁰ *FA*, 10 September 1936, 483, 507; Zavitz, *The Second Twenty Five Years*, 11-20.

1920s, a new Department of Agricultural Economics at OAC launched research into production and marketing of several important commodities and initiated formal studies on costs related to farm organization. Farmers acted on the information and expanded their acreages substantially, despite disappearing markets.⁴¹

Forestry suffered as much as agriculture from the economic impact of the depression. Enrollment at the University of Toronto School of Forestry dropped, and employment opportunities with the provincial government, which had historically hired the majority of graduates, collapsed. In response to the perceived need for practical forest experts, the curriculum at the School of Forestry was revised to teach logging technologies, as opposed to scientific forest management.⁴² In the meantime, the OAC promoted farm forestry in a halfhearted way. Comprehensive short courses in mixed farming, facilitated by Ag Reps and offered at the Guelph campus by the Department of Field Husbandry during the winter, were increasingly popular. In 1933-34, one such month-long course included a single lecture on farm forestry and landscape gardening to be delivered by a professional forester.⁴³

A new organizational structure of scientific agriculture was formulated in 1924 when a provincial Standing Committee on Crop Improvement (SCCI) was struck by the Department of Agriculture. Its membership consisted of representatives from each department of each research institution and college in Ontario, as well as scientists from the provincial and Dominion Departments of Agriculture. Several farmers had observer and advisory status at meetings. The SCCI advocated the formation of County Crop Improvement Associations (CCIAs), “for better organization and development of field days, farm meetings, demonstrations”, and other professional development activities. Ag Reps, who were also members of the SCCI, would communicate useful information from headquarters in Toronto to rural Ontario. In early 1931, a subcommittee of the new Standing Field Crop Committee recommended that the Ontario Field Crop and Seed Growers’ Association (OFCSGA), the Ag Union, and the CCIAs be amalgamated into a single group: the Ontario Crop

⁴¹ See C.A. Zavitz, *Forty Years’ Experiments with Grain Crops* (Ontario Department of Agriculture: Ontario Agricultural College, October 1927) Bulletin 332; *Annual Report of the Statistics Branch. Part I. Agricultural Statistics*, Ontario Department of Agriculture, 1932, 3; *Ontario Agricultural College Annual Report* (hereafter *OAC Annual Report*), 1926, 17; *OAC Annual Report* 1928, 16.

⁴² Mark Kuhlberg, *One Hundred Rings and Counting: Forestry Education and Forestry in Toronto and Canada, 1907-2007* (Toronto: University of Toronto Press, 2009) 89.

⁴³ *Chatham Daily News* (hereafter *CDN*), Thursday 14 December 1933, front page.

Improvement Association (OCIA), which would represent all farmers in Ontario.⁴⁴

This proposal had profound significance for Ontario agriculture. In particular, it affected the ways farmers would, in future, go about organizing as commodity producers. In the past, graduates had interacted with OAC as individual members of the Ag Union, mainly by answering advertisements in the rural press for participants in summer field experiments. Scientists, however, had played the leading roles in planning the work. In addition to individual participation in co-operative experiments, groups of producers such as corn growers, fruit growers, and dairymen had organized themselves in marketing associations with assistance from Ag Reps. But the proposed new group, the OCIA, would join all farmers under a single umbrella (although many specific producer groups carried on actively). From this association would grow the understanding that a farm is an integral part of a larger ecosystem, with particular soil, surface and ground water, field and forest conditions that demanded conservation management if they were to retain their vitality and productivity, and if agriculture itself was to survive as a viable way of life for thousands of families. The ecosystem could be a rivershed or topographic or climatic zone. In short, farmers began to organize themselves to commit the management of private properties to wider discussion and consensus. Acceptance of this new direction resulted from a series of economic and environmental crises that battered southern Ontario in the late 1920s through to the mid-1930s.

The crises of 1929-1936

The effects of routine deforestation were marginal but cumulative until environmental and economic crises of the late 1920s to the mid-1930s made them impossible to ignore. By the late 1920s, farmers in agricultural southern Ontario were caught in a vicious cycle of falling land productivity and falling commodity prices. In most cases, this had started close to a century earlier with the original farm makers who cleared native forests for building homes, planting grains, and husbanding livestock. In the early stages of settlement, they were able to sell surplus commodities, including timber and wood products, but trees are slow-growing perennials, and soon the forest crops had disappeared. Public and private initiatives to promote reforestation of marginal lands and to manage woodlots for sustainable production, some of which have been discussed earlier in this essay, were generally unsuccessful. By the time soil degradation and drought had reached critical levels, landowners could not afford to take land out of production because short term efficiency and

⁴⁴ Arthur H. Martin, *A History of the Ontario Soil and Crop Improvement Association* (Toronto: Ontario Soil and Crop Improvement Association, 1972), 2-5.

profit would be reduced on the farm as a whole. Neither could they afford to work marginal lands: time, effort and inputs were not compensated by a satisfactory harvest, and over the long term, net returns would only get worse. Scientific agriculture, which stressed maximum land use for maximum yield, was no longer a viable solution.

The depression hit households hard, and economic disaster was confounded with environmental devastation. With the dearth of cash in the countryside, firewood became a common medium of barter. A farm family with a healthy woodlot could supply its own fuel, and winters in the early 1930s were recorded as being bitterly cold. A woodlot was a definite asset, but many farm woodlots had been reduced to small and isolated islands in open fields. Furthermore, the number of distinct useful species comprising a woodlot was reduced from its indigenous composition.⁴⁵ All in all, changes meant that even farmers who retained some wooded land were more dependent on other sources for fuel, building materials, fencing, and miscellaneous items such as implement handles and furniture. Wood was likewise burned in farm buildings, such as tobacco kilns. In southwestern Ontario, especially in Essex and Kent Counties where tobacco was a very important cash crop, tobacco kilns routinely burned thousands of cords of firewood in a single drying season. Cutting trees to supply kilns doubtless made a significant contribution to flooding along the Thames River.

By about 1936, many of the counties of agricultural southern Ontario had been converted to alternating spring flood plain and summer desert. In early April, 1934, the *Chatham Daily News* warned of a growing menace on the Thames; farms and highways were already flooded, and buildings in Chatham itself were threatened. And yet, by the end of May, drought was a source of worry to area farmers! And the Thames was only one river system. Mabel Dunham mentions the “great flood” on the Grand River in 1929, even more memorable than the crash of the stock market later in the year. The swiftly-flowing Ganaraska River wrought havoc from its headwaters high in the moraines of central Ontario, near Lindsay, all the way down to Port Hope, destroying dams and mills along its way; at least one person drowned in 1890. The rest of the year, the region was dotted with abandoned farms and deserted villages. The Forest Station at Orono in Durham County was so situated to demonstrate reforestation techniques and supply seedlings to this area.⁴⁶

⁴⁵ Michael R. Moss and L. Strath Davis, “The Nature and Significance of Spatial Change in Forest Cover in the Landscape Evolution of Rural Southern Ontario, c. 1810-1980,” in *The Biogeographical Impact of Land-Use Change: Collected Essays*, ed. Richard T. Smith (Leeds: Biogeography Study Group, University of Leeds, 1985), 85-95.

⁴⁶ *CDN*, 4 April 1934, front page; *CDN*, 25 May 1934, front page; Mabel Dunham, *Grand River* (Toronto: McClelland, 1945), 265-267; *Port Hope Evening Guide*, 14 February 1978. See: <http://porthopehistory.com/floods/gannyfloods.htm>, accessed April 12 2014.

After several seasons of wet springs (causing late planting) followed by hot, dry summers (when poorly established stands failed to grow and set seed), the summer of 1936 was the proverbial straw that broke the camel's back. A heat wave originated in the southwest United States and swept over the entire North American continent, lasting for about eight days. Although the wave affected southern Saskatchewan, Manitoba and northern Ontario too, southern Ontario was hard hit. Temperatures rose to 40°C in mid-July in numerous locations. More than 500 deaths in southern Ontario alone were reportedly linked to the extreme heat. Crops wilted when rain failed to fall, and "fruit literally baked on the trees in the Niagara Peninsula." Other consequences of drought were equally ruinous. Wells and springs dried up as the water table dropped, and more farmers were forced to carry water to homes and parched livestock. Sewage disposal systems that depended on continuous river flow to the Great Lakes did not function and public health was compromised. Towns and cities were forced to spend scarce Depression-era funds on alternate methods of public sanitation.⁴⁷

In September 1936, *Farmer's Advocate*, which had a wide rural circulation and a longstanding policy of commenting on current critical issues, called for the provincial government to create an aggressive reforestation policy. Watson Porter, managing editor, laid the blame for the terrible drought squarely at the doorsteps of everyone who had responsibilities for managing forest and farm lands and had misused or ignored them. He chastised Dominion, provincial and municipal elected officials. Farmers were criticized for thoughtless tree removal: from ravines and creek bottoms, where willows and other species which tolerated wet roots held water and made it available in July and August for livestock, and from hillsides and hilltops, where woods held back ice and snow so it could melt gradually and percolate into the ground, and also created summer shade. No individual or group escaped Porter's wrath. He concluded that devastating spring floods were entirely due to deforestation: "the forests and wooded areas have been destroyed and there is nothing to hold the water back."⁴⁸

Groups in rural Ontario formed committees and planned conservation projects to promote reforestation, but these were generally local, while the problem was finally understood as an ecosystem issue which demanded a co-operative and comprehensive solution. For example, essay-writing

⁴⁷ *FA*, 10 September 1936, 483-507; J. Klaassen, "A climatological assessment of major 20th century drought in southern Ontario, Canada," in *Proceedings of the 13th Conference on Applied Climatology* (Portland, OR: American Meteorological Society, 2002), 1-3. See also Barrie L. Bonsal, Elaine E. Wheaton, Aston C. Chipansi, David J. Sauchyn and Lei Wen, "Drought Research in Canada: A Review," *Atmosphere-Ocean* 49, 4 (2011): 303-319.

⁴⁸ *FA*, 10 September 1936, 483, 507.

competitions and public-speaking contests in rural schools in Middlesex, Simcoe, and Welland Counties were meant to enlist the support of citizens for the nascent conservation movement. In Kent County the Sportsmen's Club sponsored a similar contest. The Ontario Convention of Agricultural Societies and the Whole Milk Shippers and Producers unanimously endorsed the conservation movement at their joint meeting in Toronto in 1937. And the Ontario Association of Horticultural Societies discussed conservation and tree planting at its annual convention in 1937, and made plans to plant roadside trees between Pembroke and Ottawa. Nature clubs under the sponsorship of the Federation of Ontario Naturalists (FON) promoted conservation, and automobile clubs planted trees along provincial highways and rural roads to beautify travel routes. Tree-planting was even suggested as a Coronation Project for Canadians to commemorate their allegiance to the new King, George VI.⁴⁹ While they were valuable for the spotlight which they shone on the value of trees, these projects were limited by the volunteerism and special interests of groups: travelers wanted more picturesque scenery and better road conditions; school children aspired to win first prize; endorsements cost nothing, although it is possible they confirmed an awareness of both the problem and the posited solutions among group members who had in fact reforested their properties.

In agricultural southern Ontario, however, reforestation and conservation were not interchangeable, either practically or philosophically. Thus two new associations came to be, both in 1938, in the aftermath of the catastrophic economic and environmental events of the late 1920s and early 1930s which culminated in the summer of 1936. On the one hand, the Ontario Conservation and Reforestation Association (OCRA) was a group of government officials and public figures, headed by Watson Porter. This group equated conservation with the reclamation of Ontario's riversheds by replanting trees, mainly on public lands in rural Ontario. On the other hand, the Ontario Crop Improvement Association (OCIA) was an organization of farmers, concerned with improving productivity and therefore sustainability and profitability on their private properties. Reforestation, soil and water management, and the use of suitable crop kinds and varieties were some of the strategies they adopted.

Ontario Conservation and Reforestation Association

In December 1936 and January 1937, Watson Porter called a series of meetings in London, Guelph and Bowmanville. Initially, he invited County Wardens from southwestern Ontario, as well as Ag Reps, to create a program for the restoration and conservation of woodlots and forests.

⁴⁹ *FA*, 14 January 1937, 22; *FA*, 11 March 1937, 142-143; *CDN*, 16 March 1935, front page.

Besides Watson Porter, who was also a farmer in Middlesex County, founding members of the OCRA were dairy farmer and botanist Monroe Landon of the Norfolk County Chamber of Commerce, and E.C. Drury, farmer, former UFO premier and sheriff of Simcoe County. A program and recommendations were cobbled together, revised and finally approved by county officials, Ag Reps, forestry experts, editors, managers of local Chambers of Commerce, chairmen of reforestation committees, and representatives of agricultural societies. The OCRA did not have a constitution or a membership list, and everyone was welcome to attend meetings. No one earned a salary or honorarium, or had expenses paid for any work done on behalf of the organization. There was, however, an executive committee. The association received annual grants from participating County Councils which it used to finance meetings, excursions, and printing. While considerable discussion was focused on township and county planning, the association was “all the time mindful of the part the individual must play in this programme of restoration. Farm woodlots, hilltops crowned with trees, hillsides anchored down with tree roots, windbreaks, wooded ravines and trees planted for shade and beauty” were each essential if the program was to succeed. The “individual” was not limited to the farmer/landowner, but every person who could participate spreading the message of conservation in some way.⁵⁰

Some of the most ambitious projects undertaken by the OCRA were field days and conservation tours. These tours usually took an entire day, including travel time, lunch, and dinner followed by a speaker or an illustrated talk. A tour might include an inspection of a reforestation project, a visit to a farm where specific water problems, woodlot management or farm management schemes were discussed, any or all of the above: some itineraries covered more than one hundred miles! Other field days were planned as conservation picnics and hands-on lessons for rural school children, and were held in county forests. The OCRA published an educational pamphlet, *School Forestry Clubs*, which was distributed to all schools in Ontario by the Department of Education. In several counties, a free tree seedling was also delivered to each student for planting at home or in the school yard. Events such as these, which combined education with socializing, were common and very popular in farm communities, especially when they were planned to include the whole family.⁵¹

⁵⁰ *EA*, 28 January 1937, 32, 50; *EA*, 11 March 1937, 142-143; A.H. Richardson, *Conservation by the People: The History of the Conservation Movement in Ontario to 1970* (Toronto: University of Toronto Press, 1974), 5-8.

⁵¹ Richardson, 2-3, 7-8; *EA*, 11 March 1937, 142-143; *CDN*, 16 March 1935, front page.

The OCRA was imbued with a keen sense of public duty to the citizens of Ontario, but not just to save and restore forests as an end in itself. In April 1941, at the Guelph Conference, representatives of the OCRA and the FON jointly drafted a recommendation for the formation of a “Canadian conservation corps,” a work force of returning soldiers. These men would be assigned to work on various projects sponsored by the OCRA, thereby alleviating the economic slump which was expected to occur when the war finally ended. In August 1941, a committee of the Guelph Conference met with the Canadian Committee on Reconstruction in Ottawa, where it was agreed that if an appropriate demonstration project could be identified and outlined by the OCRA, and a detailed survey of the area published as a special piece of conservation research for general application to Canada, the OCRA might then receive a grant to help cover costs associated with the study. The Ganaraska watershed was selected for the report, and A.H. Richardson released *A Report on the Ganaraska Watershed* in 1944. The project as he envisioned it was to last for two years, and employ 600 men at improving woodlots, planting trees, buttressing and rebuilding eroded lands, constructing dams, organizing public recreational centres and “improving farmlands.” Because post-war unemployment never materialized as a major social problem, the Ganaraska plan was never implemented.⁵²

Nevertheless Richardson, who was by then an executive of the OCRA and director of the Conservation Branch in the new provincial Department of Planning and Development, concluded that conservation on public lands in Ontario had been revitalized by the enthusiastic acceptance by both provincial and federal governments of the concept of water resource management. This new direction – water management – was embraced by the OCRA and led to the passage of the Conservation Authorities Act in 1946, and the subsequent formation of rivershed conservation commissions and authorities. The objectives of the Act were the protection of wildlife populations, the creation of opportunities for recreation on water and on land, and the restoration of arable farmland by reducing flooding and erosion. Conservation Authorities were established to administer the integrated strategies necessary for year-round water flow control. Construction of dams and reservoirs proceeded in many counties by the early 1950s to first of all protect urban centres from floods, and also to ensure adequate minimum flows throughout the entire year. In many counties, prime farmland was inundated and family farms were lost

⁵² Richardson, 9-18; John Bacher, *Two Billion Trees and Counting: The Legacy of Edmund Zavitz* (Toronto: Natural Heritage Books, 2011), 190-191.

to the bottoms of artificial lakes when water courses were diverted and dammed.⁵³

As citizens of the province, farmers and farm families had every right to enjoy the amenities provided by these public resources, but their private properties demanded their attention. Farm families made a living from the land: their homes and workplaces were one and the same, and business and affective matters were not easily separated. The crises of the 1920s and Dirty Thirties made it clear to Ontario farmers that self-organization and applied scientific agriculture were the most solid bases on which to model efficient and productive land management. In 1935, when negotiations to phase out the Ag Union and the OFCSGA and form the OCIA were in full swing, Ag Union President Douglas Hart of Woodstock summarized this philosophy of individual farmers and farm families functioning as part of a rural community:

No matter how sound these experimental results [from OAC and other experts] may be, unless we can work them out on our farms with the money and labor available and in face of the weather and all the pests we have to fight, they are not satisfactory for us. ... Later these have to be tested on your farm and mine.⁵⁴

To this end, farmers formed the Ontario Crop Improvement Association (OCIA) in 1938.

Ontario Crop Improvement Association

Professor W.J. Squirrell, long-time Secretary and Treasurer of the Ag Union, who assisted and then replaced C.A. Zavitz in the Department of Field Husbandry, provided administrative continuity and philosophical and material support for the Ag Union until the summer of 1936, when he was killed in an automobile accident. Whereas Squirrell had spent his entire career at OAC, his successor, Dr. G.P. McRostie, had a PhD from Cornell University and job experience as Head of the Field Husbandry Departments at both Macdonald College at Montreal and the University of Manitoba and as Dominion Agrostologist.

The new Professor of Field Husbandry used his authority and control of OAC resources to reroute research and experiment on a course of careful experimental design and rigorous replication. At the annual meeting of the Ag Union in 1937, he suggested that more accurate experimental information could be obtained if tests were conducted in duplicate or even triplicate, a dedication of time and space that would be very difficult, if not impossible, for many co-operative members to pledge. One-off trials on farms spread randomly throughout the province were typical of Ag

⁵³ For a discussion of the establishment of Conservation Authorities in Ontario, see Richardson, especially 29-102.

⁵⁴ *Ag Union Annual Report*, 1935, 7.

Union experiments; McRostie sub-divided the province into areas with reasonably similar growth conditions to facilitate recommendations for regionally adapted varieties. The following year, he outlined the new experimental regime he had put in place at OAC: continuation of the usual small observational plots employed by the Ag Union, which had “in the past been productive of much information concerning the suitability of varieties for widely scattered districts”, and three new designs, each of which stressed replication and accuracy.⁵⁵ As Professor of Field Husbandry at OAC, he set a new course for research and experiment that was based on the separation of science and production.

McRostie retained the position of Secretary-Treasurer of the Ag Union, but he transferred his professional support to the OCIA. Its first annual meeting was held in Toronto in 1939, whereas Ag Union annual meetings had always been held at OAC at Guelph, a very social event with the feel of a homecoming. McRostie was appointed to a Project Approval Committee for allocating funding support from the Department of Agriculture to county branches for projects and prize monies. OCIA members were discouraged from engaging in independent experiments on their farms by a formal resolution “that all “fact finding experiments” shall be undertaken by Agricultural Research Institutions and that CCIA’s confine their projects to demonstrations based on the findings of these institutions.”⁵⁶ This proposal was introduced by farmer Alex M. Stewart and supported by the membership. The primary activity of the OCIA and county branches became the promotion of clean seed at seed fairs and displays, where members displayed and sold grain, clover and grass seed and seed potatoes. The main source of income for the OCIA, aside from an annual government grant (from \$200 to \$300 in the first few years) was membership dues and banquet receipts.

Like the Ag Union (which had also been subsidized by the provincial Department of Agriculture to cover the costs of field experiments), the OCIA was an organization for farmers interested in improving. Unlike the Ag Union, the OCIA was open to all farmers, not just OAC alumni. By 1939, when the Ag Union celebrated its 60th anniversary, many members were retired and unable to participate actively in co-operative experiments or even to travel to the annual meeting.⁵⁷ Short Courses, usually held at OAC in the winter when residence space was available and mixed farmers had no field work, were very popular. They introduced scientific agriculture to farmers who would not otherwise attend OAC. In 1939, several hundred persons attended the Ag Union banquet, including many

⁵⁵ Ibid; *OAC Review* 50, 4 (January 1938), 207-208.

⁵⁶ *Annual Report of the Ontario Crop Improvement Associations* (hereafter *OCIA Annual Report*), 1940, 32-33; *OCIA Annual Report*, 1942, 27; *OCIA Annual Report*, 1943, 46-47.

⁵⁷ *OAC Review* 50, 4 (January 1938), 230, 232; *OAC, Review* 51, 4 (January 1939), 243-245.

farmers enrolled in Short Courses running on campus over the Christmas break. These students were encouraged to join the OCIA, as were all regular students. It was a popular alternative to the Ag Union, whose membership subsequently diminished among young and active farmers.

This was the beginning of what may seem to be a paradox: after 40 years, individual farmers were excluded from participating in co-operative experiments. In fact, new farmer organizations such as the OCIA and commodity marketing groups interacted with scientists and politicians, but separately, as professional groups with special interests and areas of expertise in scientific agriculture. Scientists interpreted theory to investigate general regional problems, while farmers applied scientific principles derived from research and experiment to manage unique farm resources and cultivate crops and livestock in environmentally diverse regions of agricultural Ontario.

The constitution of the new OCIA was set out in November 1938. Stewart was the last President of both the Ag Union and the OFCSGA and he served as the first President of the OCIA. In his inaugural address, he urged farmers to replenish the soil first and foremost to increase production. The essence of his speech was that farm management should be comprehensive, and that all the elements of a mixed farm (which was typical in Ontario at that time) – soil, water, crops, livestock, pests and weeds – should be managed in accordance with the best scientific information available from OAC. He acknowledged that after a farmer began a program of rehabilitation on seriously depleted soil it would take a long time to recover productivity and production. These last remarks were significant for two reasons. First of all, he brought farm deforestation to debate in a conference of farmers. Secondly, he articulated the primary reason that farmers were in business: production of food and feed to support a family. Most found it unthinkable that they should withdraw land (even marginal or waste land) from crop production or pasture to plant trees, especially when the Depression was just coming to an end. Under Stewart's guidance, they began to seriously search for methods of soil and water conservation that were more compatible with the principles of scientific farming, although not necessarily with scientific forestry.⁵⁸ The Ag Union published an *Annual Report* in 1940; that year, 110 replicated rod row tests were conducted through the County Crop Improvement Associations and the local Ag Reps. By 1942, 48 branches of the OCIA had been organized in all parts of the province.⁵⁹ By 1942, Ag Union annual reports ceased and the organization itself came to an end. At OAC, a Department of Soils was separated from the Department of Chemistry in 1945. Some of its earliest research was

⁵⁸ *Ag Union Annual Report*, 1937, 1-8.

⁵⁹ *OAC Annual Report*, 1940, 65; *OCIA Annual Report*, 1942, 25.

inspired by Essex County farmers whose soils were compacted and unproductive after years of continuous row crops. Some farmers ran co-operative demonstration plots comparing different tillage and residue disposal techniques under study at OAC. OCIA members visited the campus. In 1952 the organization's name was changed to Ontario Soil and Crop Improvement Association (OSCIA), a move which reflected the growing awareness that water and soil management were inseparable in an agricultural ecosystem.⁶⁰ Collaboration improved the efficiency of both farmers and scientists.

The OCIA and OSCIA never abandoned the official concept of conservation of natural resources. They continued to emphasize conservation in the contexts of scientific agriculture, private land and individual effort, including the efforts of farm families, which were the social units of agricultural production and the agricultural economy. In 1949, the Ontario County Crop Improvement Association (OCCIA), the OCIA and the Ontario County Council jointly held a Conservation Day near Brooklin. Together, the community renovated a farm. In almost a single day, volunteers contour-ploughed a steeply sloping field and seeded it to wheat, tiled a low wet field to improve drainage, ploughed, worked and seeded another field with a good perennial pasture mix, removed old and broken fence rows, painted the barn, paved the barnyard, and erected an implement shed. They also painted the house and rebuilt the kitchen, landscaped the yard and erected forty rods of new wire fencing. Implement companies and manufacturers of agricultural equipment donated machinery for demonstration purposes. Experts from federal and provincial departments of agriculture supervised the work and explained it to volunteers and observers who were keenly interested. After the modifications and repairs were complete, and field improvements had time to take effect, the farm owner, Heber Down, reported significantly greater crop yields. The house was a more pleasant place to live and raise a family.⁶¹ To landowners in attendance, Conservation Day was a demonstration of scientific management of the physical resources on private property to sustain the natural environment, to provide a decent living, and to maintain social and economic stability in rural Ontario.

Conclusion

Private land ownership of individual plots, of a size that could be worked by a family for self-provisioning and marketing of any surplus, was the norm in agricultural southern Ontario to the middle of the twentieth century. Therefore, a farmer who owned land was recognized as the steward of that land, and free to manage all its physical resources as he

⁶⁰ *OAC Annual Report*, 1944, 58, 69; *OAC Annual Report*, 1945, 66.

⁶¹ Martin, 20.

deemed most economically and environmentally advantageous for the making and managing of a prosperous farm. These resources included field and forest cover, soil, surface waterways and ground water, and any other topographical features. Farm forestry has been the concern and responsibility of farmers on their private property. Notwithstanding government incentives to re-establish woodlots and reclaim wastelands to forest, and the rise of scientific forestry, many farmers gave little time or effort to reforestation.

It was understood by the late 1920s that the indiscriminate cutting of trees that had been going on for almost a century had inflicted grave damage to the environment. Farmers, who were committed to maximizing yields of mostly annual crops (grains, row crops and roots for feed and food), finally accepted that natural resource conservation was their best course of action for turning the damage around and restoring productivity. While many families abandoned their properties and headed for new plots on the west coast of Ontario or in western Canada, others stayed. By organizing themselves as the Ontario Crop Improvement Association, which evolved to the Ontario Soil and Crop Improvement Association, they committed to the comprehensive management of natural resources in the agricultural regions of southern Ontario. As communal owners of Ontario agricultural ecosystem, they worked to reclaim and rejuvenate it.

Through the period analysed in this essay and continuing to the present, farmers and farm groups and other individuals and groups with an interest in rural Ontario have responded with different philosophical and practical points of view about the value of natural resources and conservation management on farms. The historical progress of rural deforestation and reforestation is proof of that. These points of view continue to be controversial. For example, the move to specialization in a single crop or commodity, like hog farmers who only raise hogs, and grow or purchase feed produced at one location but dispose of manure at a different location, exacerbates the problems which arise when the southern Ontario ecosystem is ignored. The traditionally closed cycle of nutrient flow is broken. Conservation management of soil, water and other related resources is not successful, and this affects other farmlands and bodies of water. The recreational value of neighbouring land and water is spoiled.⁶² Without knowledge of the history behind the problem, producers and consumers who claim ownership of the resource and responsibility for its stewardship cannot implement a satisfactory solution.

⁶² Ongoing problems with ground water and surface water contamination from hog manure in Bruce County are just one contemporary example of this issue. See for example "Grey and Bruce Groundwater Study. Final Report," Waterloo Hydrogeologic Inc, WHI Project # 3020337, July 2003. See: http://www.grey.ca/media/files/Final_Report.pdf, accessed 12 April 2014.

The following reflection, although it describes the Green Revolution in the 1950s and 1960s in Third World countries, is nonetheless relevant to past and current resource management in agricultural southern Ontario: “An appreciation of how agriculture got to be the way it is by no means guarantees the wisdom or success of the reform movement. Reform without an appreciation of history, however, is even more likely to aim at the wrong target and not succeed.”⁶³

⁶³ John H. Perkins, *Geopolitics and the Green Revolution. Wheat, Genes, and the Cold War* (New York Oxford: Oxford University Press, 1997), viii.