

## Northern Exposure Agroforestry in Canada

### En français

L'agroforesterie est bien ancrée dans les systèmes agricoles tropicaux et subtropicaux. C'est depuis les 25 dernières années seulement que les résidents des pays au climat plus tempéré, comme les États-Unis et le Canada, ont commencé à examiner les avantages de l'adoption de pratiques et de systèmes d'agroforesterie.

Dans ce numéro, nous présentons un article sur le point de vue de nos voisins canadiens en ce qui a trait aux technologies agroforestières et à leur adoption. Comme aux États-Unis, l'agroforesterie canadienne a débuté avec les brise-vent. Toutefois, au Canada, l'agroforesterie visait, à ses débuts, autant à inciter les producteurs à poursuivre leurs activités qu'à protéger les cultures et les sols comme l'a démontré l'Administration du rétablissement agricole des Prairies (ARAP) dont l'administration centrale est en Saskatchewan (voir l'article de la page 6). L'intérêt pour l'agroforesterie est apparu dans les Provinces des Prairies et s'est étendu de la Colombie-Britannique (p. 3) au Nouveau-Brunswick (p. 6). Pour ceux d'entre nous qui habitent au sud du 49<sup>e</sup> parallèle, cela se traduit par « de la Californie au Maine ».

### In English

Agroforestry has deep roots in tropical and sub-tropical agricultural systems. It has only been in the last 25 years that people in more temperate climates, like the United States and Canada, have begun to consider the benefits of adopting agroforestry practices and systems.

In this issue we feature our Canadian neighbors' perspective on agroforestry technology and adoption. Like in the United States, Canadian agroforestry has its beginnings with windbreaks. However, in Canada the emphasis was as much in encouraging farmers to stay on the land as it was for crop and soil protection as demonstrated in the Prairie Farm Rehabilitation Administration (PFRA) headquartered in Saskatchewan (see article on page 6). Interest in agroforestry has emerged from the prairie provinces and has spread from British Columbia (p. 3) to New Brunswick (p. 6). For those of us south of the 49<sup>th</sup> parallel that translates to "from California to Maine."



## Inside

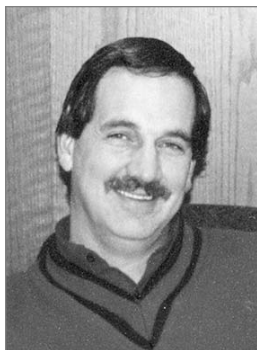
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CANVis:  
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ACROSS CANADA,  
AGROFORESTRY IS FAR  
FROM PROVINCIAL

3-7



# NAC Director's Corner

A commentary on the status of agroforestry by NAC Director, Dr. Greg Ruark

## Realignment of NAC

At the beginning of 2005, the National Agroforestry Center (NAC) was realigned within the Forest Service to better position it to garner national support. The administrative oversight of NAC's Forest Service research and technology programs has been shifted from the Rocky Mountain Research Station in Ft. Collins, CO to its new home at the Southern Research Station in Asheville, NC.

While I remain NAC's National Program Manager, I am now located in Huntsville, AL on the campus of Alabama A&M University (AAMU). Plans are for all other Forest Service personnel in Lincoln, Nebraska to be retained there, but to report to me in Huntsville. The Lincoln location will continue its research efforts on upland and riparian forest buffers for water quality and will remain NAC's clearinghouse for producing and distributing technology on a broad array for agroforestry practices.

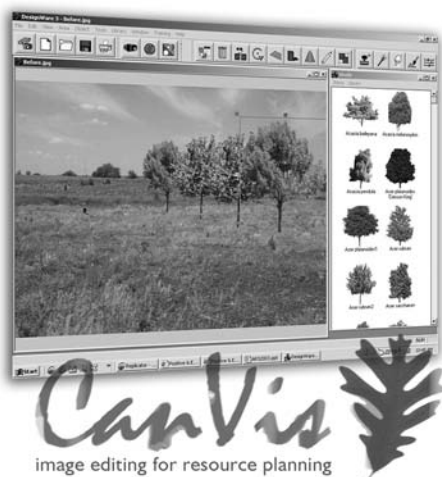
I am optimistic that this new administrative alignment can

help further agroforestry by providing an expanded national platform. The relocation of NAC's headquarters will allow it to partner with universities, state and local agencies, and other interested groups to build on the growing agroforestry momentum in the Southeast. We will also continue to expand our efforts with AAMU and other historically black universities through the newly formed "1890 Agroforestry Consortium". Efforts will be made to increase NAC's funding and staffing at both the Lincoln and Huntsville locations over time. Meanwhile, NAC is in the process of reconfiguring its continuing partnership with the Natural Resources Conservation Service (NRCS), a partner in NAC since 1995, to determine how best to insure program delivery and effectiveness nationally.

I am looking forward to continuing to work together with our many partners to advance the science and practice of agroforestry.



## CanVis now available!



### Plant mature trees with a click of your mouse.

The National Agroforestry Center has just released an exciting new tool called the CanVis Visual Simulation Kit. This two CD collection contains CanVis, a photo-editing software program, and the Visual Simulation Guide, a how-to manual for creating visual simulations of proposed conservation design and management scenarios.

Photo-realistic simulations communicate ideas in ways that line drawings and words cannot, making this technology appropriate for any activity, program, or project where visual media would enhance communication.

One of the main benefits of CanVis is the collection of object libraries which contain images of plant materials, agricultural elements, people, and wildlife that can quickly be added into a digital photo or image.

The Visual Simulation Guide is a multi-media CD reference manual on how to create simulations, and provides guidance on how to plan a simulation project, acquire images, edit an image, and accurately locate and size objects in an image. Several natural resource planning projects are provided as working examples.

For more information, and to order a copy of the kit, log onto [www.unl.edu/nac/simulation](http://www.unl.edu/nac/simulation).



# Agroforestry a part of Canada's green cover

The Prairie Shelterbelt Program promotes the environmental and economic benefits of agroforestry through research, technology transfer, and the provision of tree and shrub seedlings to prairie farmers.



## Laura Poppy

Agriculture & Agri-Food Canada  
Indian Head, Saskatchewan

If you have an interest in agroforestry and are travelling across Canada, you must visit Indian Head, Saskatchewan. It is at this small, prairie town that Agriculture and Agri-Food Canada (AAFC) headquarters its Agroforestry Division.

Agroforestry has been designated as a beneficial management practice and is promoted and supported by AAFC through federal initiatives such as the Prairie Shelterbelt Program, Greencover Canada and the National Farm Stewardship Program.

Agroforestry is promoted on a national scale through Greencover Canada, a program designed to promote sustainable land use and to expand the land base covered by perennial forages and trees.

The Shelterbelt Research component of Greencover Canada is administered by AAFC's Agroforestry Research Unit,

and concentrates on developing agroforestry science, technology and genetic materials for the improvement of the agro-ecosystem. Research focuses on increasing the understanding of the functions and processes of agroforestry practices (with emphasis on shelterbelts and riparian buffers). Research tackles critical knowledge gaps related to tree health, growth and function; agroforestry design and the environmental and economic effects of agroforestry in agro-ecosystems.

The Prairie Shelterbelt Program, a long-standing program administered by the Agroforestry Division, provides hardy tree and shrub seedlings that are suitable for establishing shelterbelts in a harsh prairie climate. It is available to agricultural landowners across western Canada.

The recently introduced National Farm Stewardship Program works in conjunction with each of the provincial governments to encourage the adoption of various beneficial management

practices, including farm and field shelterbelts, livestock and riparian buffers and tree planting projects to increase wildlife habitat and biodiversity.

AAFC's Agroforestry Division objectives include utilization of trees for the protection of soil and water resources, improvements in air quality, enhanced wildlife habitat and biodiversity, increased economic returns to farmers and a better quality of life for rural residents. The Agroforestry Division applies an integrated approach to these sustainability issues by conducting and facilitating environmentally and economically significant research; developing and delivering technology transfer tools, products and services; and providing tree and shrub seedlings for the adoption and integration of agroforestry practices on the agricultural landscape.

For more information, visit the AAFC Agroforestry Division website at [www.agr.ca/pfra/shelterbelt.htm](http://www.agr.ca/pfra/shelterbelt.htm).





# From awareness to industry development

## Agroforestry in British Columbia

**Lisa Zabek**

British Columbia Ministry of Agriculture, Food and Fisheries  
Abbotsford, British Columbia

In British Columbia, interest in agroforestry as viable production systems, and awareness as an emerging industry, stems from a series of loosely connected events:

- Escalating interest in alternate crops and cropping strategies by producers and consumers.
- A high degree of interest in promoting good stewardship by all sectors in support of production systems.
- The “raised on the radar” effect of workshops conducted around the province (BCMAFF and others) that provided an overview of the various practices and potential opportunities.
- Continuing exposure via theoretical and hands-on courses (in-class, continuing education, web-based, and workshops) offered by Universities and Colleges within the province.

To capitalize on the emerging opportunities an Agroforestry Industry Development Initiative was formed by industry and government representatives to foster agroforestry in British Columbia. In 2002, a survey of producers was conducted as the first step in formalized industry development. Awareness of, and interest in, the potentials were high. However, while stewardship and the economic reasons for adopting agroforestry systems into current production practices “sound great”, adoption came down to four key areas:

### 1. Show me

“It sounds like agroforestry might be a good idea, but where do I see it?” This type of question forms a central driver of the BC Agroforestry Industry Development Initiative. Prior to embarking on individual project development the Agroforestry Industry put together a strategic plan in 2003 based on the survey results. The cornerstone of the strategic plan is development of operational producer demonstration sites around the province.

### 2. Information and extension

Surveyed producers indicated a range of information needs,

including crop production methods, costs and returns of production, and “anything to do with marketing.” The network of demonstration sites will form the basis for tours and workshops, sources of information for technology transfer materials, and ultimately help create “on-the-farm” agroforestry-producer experts.

### 3. Producer / buyer / consumer disconnect

“We direct market a lot of our products via the web, farm markets, etc. We do well, but to move to the next level we need a means for people to find us when they don't know they are looking for us.” Producers identified a strong need for developing the means to facilitate the exchange of products and information, thereby increasing awareness and market access.

### 4. Value-added

Quality is the number one customer concern. Knowledge of farm stewardship is viewed as a part of that quality.

**While stewardship and the economic reasons for adopting agroforestry systems “sound great”, adoption came down to four key areas.**

The Agroforestry Initiative is working to address these four key areas by focusing activities for the first two years on development of demonstration sites and technology transfer activities. The Initiative is a cost-share program requiring matching industry support. So far,

two demonstrations have been approved with several more under review:

- “Tapping Bigleaf Maple” located on Vancouver Island..
- “Cedars, Bigleaf Maple, and High-value Hardwoods” located in the Fraser Valley.

The Agroforestry Industry Development Initiative is administered by the Federation of British Columbia Woodlot Associations. For more information about the Initiative and projects please visit [www.woodlot.bc.ca](http://www.woodlot.bc.ca) and follow the agroforestry link. Funding for the Agroforestry Industry Development Initiative is provided through the Agri-Food Futures Fund of the Investment Agriculture Foundation of British Columbia. The Investment Agriculture Foundation receives this funding from Agriculture and Agri-Food Canada and the British Columbia Ministry of Agriculture, Food and Fisheries.





## Cows and Fish

The Alberta Cows and Fish partners are working together with farm and ranch families to foster a better understanding of how improvements in grazing management on riparian areas can enhance landscape health and productivity, for the benefit of producers and others who use and value riparian areas. Cows and Fish promotes the improvement of riparian areas, their ecological processes and functions, through a collaborative partnership and voluntary, proactive community-based action that uses education and awareness about management options for livestock producers and their communities.

The Alberta Cows and Fish program was established in 1992 through a partnership between the Alberta Beef Producers; Trout Unlimited Canada; the Canadian Cattlemen's Association; Alberta Sustainable Resource Development; Alberta Environment; Alberta Agriculture, Food and Rural Development; Prairie Farm Rehabilitation Administration; Fisheries and Oceans Canada; and Alberta Conservation Association. Most important to

see **COWS AND FISH** on page seven

### Program objectives

- Promote an understanding of riparian health and function
- Communicate the benefits of good riparian management
- Promote proactive voluntary solutions to riparian area conflicts
- Demonstrate value of cooperative, interdisciplinary and community efforts in resolving resource conflicts
- Improve the overall productivity and health of Alberta's landscapes and communities

# Agroforestry: An emerging field in Atlantic Canada

**Caroline Pagé**  
Université de Moncton -  
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Atlantic Canada has always relied on natural resources to insure its survival and economic development. However, for many years the rural population has been declining. Moreover, emerging environmental issues, like water quality, soil conservation, biodiversity, and climate change, have brought new challenges. Increasing expenses, lower product prices, and the need to develop innovative and sustainable land management techniques have raised interest in agroforestry.

Indeed, agroforestry practices are perceived as economically, socially, and environmentally beneficial, all key aspects of the sustainable development Atlantic Canada is pursuing. But it is difficult to know where to begin, as work is needed at various levels.



Agroforestry enterprises diversify the landscape and the rural economy.

Although a lot has been done in temperate agroforestry research and development in North America, very few trials and research initiatives have been conducted in Atlantic Canada.

Following are a few of the current research projects in the region, some of which are Federally funded by Agriculture and Agri-Food Canada:

- The effectiveness of riparian forest buffer systems to filter pollutants in agricultural runoff and sequester nutrients (conducted by Ken Webb, AAFC Crops and Livestock Research Centre, Truro, Nova Scotia)
- The Effect of Agroforestry Buffers on Biodiversity in Lowbush Blueberry Agro-Ecosystem (conducted by Steve Javorek, Atlantic Food and Horticulture Research Centre, Kentville, Nova Scotia).

Other initiatives include:

- The potential of afforestation of cutover peatlands in New Brunswick for carbon sequestration and reduction of greenhouse gas emissions (developed by the Université de Moncton - Peat Research and Development Center Inc.)
- The use of Alley Cropping in Potato production (AAFC Crops and Livestock Research Centre, Charlottetown, Prince Edwards Island).

Another emerging research area involves harvesting of a wide range of non-timber

see **ATLANTIC CANADA** on page seven



# Tree-based intercropping in southern Ontario

Research & development at the University of Guelph

**Andrew M. Gordon, Ph.D., R.P.F. and Naresh Thevathasan, Ph.D., P. Ag.**  
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Studying the interactions of trees and crops at the University of Guelph research site supports the adoption of intercropping agroforestry.

An estimated 57 million hectares (143 million acres) of marginal or degraded land is considered to be available for agroforestry establishment in Canada. Even so, the slow adoption of intercropping (alley cropping) systems in the area may be partially due to unfavorable tax systems and limited awareness of the environmental and social benefits and intricacies of adopting and practicing agroforestry. During the past 20 years, the University of Guelph, Ontario has conducted research to bridge these knowledge gaps that are essential for promoting and extending the

practice of agroforestry. The University has focused on tree-based intercropping systems.

Results show that yields of soybeans and wheat intercropped with trees, as well as growth of trees, did not differ from those in corresponding sole-stand (conventional) systems of crops and trees. More specific results include:

- Increased soil organic carbon content (absolute increase of one percent over eight years)
- Increased bird and insect diversity (ten times more bird diversity in the intercropped area).
- Increased abundance and distribution of earth worms. This was higher closer to tree rows indicating improved soil health.

continued on next page

## Ontario agroforestry statistics

Commodity	Significance of industry	Annual value (\$)
Farm woodlots	1,450,000 acres / 587,045 ha	\$19.7 million (Agricultural Census, 1996), plus \$60 million in-kind use of forest products on farms (e.g. fuel wood, posts, building materials, foods, decoratives, hunting)
Christmas trees	30,000 acres / 12141 ha	\$8.3 million (Statistics Canada, Agriculture Division 2001)
Nuts	2000 acres / 810 ha	\$200,000 (nut & nursery tree sales)
Maple products	1.3 million taps, 2600 farms	\$15 million value, plus tourism and spin-off values to local economies (Agricultural Census, 2001)
Maple orchards	Greater than 50	Little tapping yet, demonstration value
Forest ginseng	1000 - 2000 acres / 404 - 808 ha	Most acreage not yet mature. Value: \$250 to \$500 / dried pound.
Farm windbreaks and building shelters	8749 windbreaks, 67,520 shelterbelts	- 8 to15% crop yield increase on protected land. - 10 to15% heating and cooling cost savings. - Difficult to measure value of soil conserved.
Timberbelts (sawlogs from fencerows)	25 acres (new idea)	N/A
Hardwood plantations	Not documented	Combines technology in orchard horticulture, forestry and landscape nursery.
Intercropping (tree nut and tree fruit orchards)	Area not documented. Only practiced in new non-bearing orchards.	Traditional orchard practice, combines orchard agriculture with other agricultural crop production practices.

Table by Dave Chapeski, Agroforestry Specialist; Ontario Ministry of Agriculture and Forestry (OMAF), Kemptville, Ontario. [http://www.gov.on.ca/OMAFRA/english/crops/facts/info\\_statistics.htm](http://www.gov.on.ca/OMAFRA/english/crops/facts/info_statistics.htm)

- The carbon sequestration potential in hybrid-poplar-based intercropping systems was four times more than that reported for conventional agricultural fields in the region.
- Reduced fertilizer use and more efficient N-cycling could also lead to the reduction of nitrous oxide emissions from agricultural fields.

Along with this rich history of agroforestry research, the University of Guelph was instrumental in organizing and hosting the 1<sup>st</sup> North American Agroforestry Conference in 1989. It is easy to see that the University of Guelph is in the forefront of agroforestry in eastern Canada.



Incorporating trees into traditional cropping systems increases soil carbon, bird and insect diversity, and earthworm populations, while improving N-cycling.



## Cows and Fish

continued from page four

the initial success of the partnership was the cooperation of a number of southern Alberta ranchers that applied riparian grazing strategies to restore riparian conditions, or shared existing grazing practices that have been effective in maintaining riparian health. Since then, producers across the prairies have been involved with Cows and Fish, sharing their experiences and working with their communities on riparian health.

What if you don't have any cows or fish?

Cows and Fish isn't just about cattle producers and fish; it is a program to promote the understanding and appreciation of riparian areas for landowners, resource managers and the general public. Whether we are urban or rural, ranchers, farmers, anglers, or downstream water drinkers, we are all a part of a watershed and, therefore, all linked by riparian areas.

For more information on Cows and Fish, visit [www.cowsandfish.org](http://www.cowsandfish.org).

## Atlantic Canada

continued from page five

forest products (NTFP). The largest NTFP industry in New Brunswick is crafting Christmas wreaths using balsam fir branch tips. Another fast growing NTFP industry is the harvest of ground hemlock (*Taxus canadensis*) for pharmaceutical use. The Canadian Forest Service and the Faculty of Forestry of the Université de Moncton have been working to establish sustainable harvesting guidelines. Research trials on other products, such as the curled shoots or "fiddleheads" of Ostrich Ferns and various types of mushrooms are also being done.

Then, there is the adoption side of it! In order to promote and coordinate the development and adoption of agroforestry practices, a pilot project has been undertaken by the Fédération des Agriculteurs et Agricultrices Francophones du Nouveau-Brunswick (Francophone Agricultural Producers Association) in partnership with the Faculty of Forestry of the Université de Moncton - Campus of Edmundston. Agroforestry can diversify the rural



Sustainable agricultural operations often integrate the management of multiple crops to take advantage of crop and livestock interactions.

economy of the region and address an important seasonal employment issue. This pilot project is located in the North West New Brunswick region and will result in a Regional Action Plan (in March 2005) to develop and promote agroforestry.

With the challenges for the agricultural industry in Atlantic Canada, interest and support of agroforestry will continue to grow in the coming years.



## Université de Moncton offers Agroforestry Bachelor's Degree

Whether we're talking about planting a short rotation crop under a forested canopy, integrating livestock into a conifer plantation, installing shelterbelts around fields, designing a riparian buffer zone, or harvesting non timber forest products (NTFP), we are talking about potential agroforestry practices for Eastern Canada that are, for the most part, unknown. This emerging field, however, will soon become more common and the Forestry of Faculty of the Université de Moncton - Edmundston Campus (UMCE) plans on being a leader in the development of these new practices.

In order to develop and promote this emerging science, a bachelor's degree program in agroforestry was initiated in September 2004. The five-year program is offered jointly by the Faculty of Forestry of the Université de Moncton -

Edmundston Campus (UMCE) and the Center of Excellence in Agricultural and Biotechnological Sciences (CESAB) of the New Brunswick Community College. Graduates of this program will be able to consult, analyze, conceptualize, and utilize agroforestry approaches in an agricultural or forestry setting. Interesting fact: it is the first of its kind in America!

Moreover, this new program should raise the interest for new agroforestry research and development initiatives in Atlantic Canada, and therefore lead to increased landowner adoption of agroforestry.

For more information, please contact the Faculté de foresterie at 1-888-736-8623 or by e-mail at: [fdef@umce.ca](mailto:fdef@umce.ca), [www.umce.ca/foresterie](http://www.umce.ca/foresterie).

# Upcoming Events

## March 21-22, 2005

"Forests Then & Now: Historical Perspectives and Current Issues." Moscow, Idaho. Contact: Sara McCullough, [clwtr@moscow.com](mailto:clwtr@moscow.com), [www.clearwaterrcd.org](http://www.clearwaterrcd.org).

## March 30 - April 1, 2005

Small Log Conference: "Creating Capacity to Compete." Coeur d'Alene Resort, Idaho. Contact: Jan Raulin, [tenaj@telus.net](mailto:tenaj@telus.net), [www.forestnet.com/slc/index.htm](http://www.forestnet.com/slc/index.htm).

## April 2, 2005

Tri-State Forest Stewardship Conference Keokuk, Iowa. Contact: Paul Wray, 515-294-1168, [phw@iastate.edu](mailto:phw@iastate.edu).

## April 9, 2005

Northeast Wisconsin Private Woodland Owners Conference on Non-Timber Forest Products: "A Fortune in the Forest." Rhinelander, Wisconsin. Contact: Bill Klase, 715-365-2658, [william.klase@ces.uwex.edu](mailto:william.klase@ces.uwex.edu).

## May 17-18, 2005

"Restoring Greenspace: Ecological Reuse of Contaminated Properties in EPA Region 6." New Orleans, Louisiana. [www.wildlifehc.org/events/restoringgreenspace.cfm](http://www.wildlifehc.org/events/restoringgreenspace.cfm), [greenspace@wildlifehc.org](mailto:greenspace@wildlifehc.org).

## June 12-15, 2005

Ninth North American Agroforestry Conference: "Moving Agroforestry into the Mainstream." Rochester, Minnesota. <http://cinram.umn.edu/afta2005/>

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## Mission



The USDA National Agroforestry Center (NAC) is a partnership of the Forest Service (Research & Development and State and Private Forestry) and the Natural Resources Conservation Service. It is administered by the Forest Service Southern Research Station and its Program Manager and Headquarters are located in Huntsville, AL on the campus of Alabama A&M University, while its research, clearinghouse, and technology development staff are concentrated in Lincoln, NE at the University of Nebraska. NAC's purpose is to accelerate the development and application of agroforestry technologies to attain more economically, environmentally, and socially sustainable land-use systems. To accomplish its mission, NAC interacts with a national network of partners and cooperators to conduct research, develop technologies and tools, establish demonstrations, and provide useful information to natural resource professionals.

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