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AGROFORESTRY

IN QUEBEC

Multiple practices and partners, one single commitment

The economic and environmental challenges currently facing the agricultural and forestry sectors are prompting stakeholders in these sectors to consider new ways of operating. By combining the strengths of agriculture and forestry, agroforestry opens up promising new prospects for the future of rural communities.

Agroforestry is gaining momentum at a time when Quebec society is increasingly demanding sustainable natural resource management and environmentally friendly development approaches. Landscape enhancement, integrated land use management and sustainable development are all areas in which agroforestry can make a positive contribution.

Agroforestry takes several forms and is attracting growing interest in Quebec from local and regional stakeholders, who are incorporating agroforestry activities in their land management and development projects, viewing it as a concrete tool for the sustainable development of rural land resources.

Canada

Systems with many advantages

Agroforestry systems provide numerous ecological and environmental advantages. They protect crops, livestock, soil and watercourses, stimulate biodiversity, contribute to carbon sequestration and even mitigate the effects of climate change. In terms of social and economic benefits, these systems create jobs, improve public opinion and perceptions of agriculture and forestry, and enhance the landscape. In addition, agroforestry systems generate additional farm revenues over and above producers' traditional farm revenues – a good way for producers to diversify their economic activities! To fully realize the potential of agroforestry, a broad suite of tools and resources are needed.

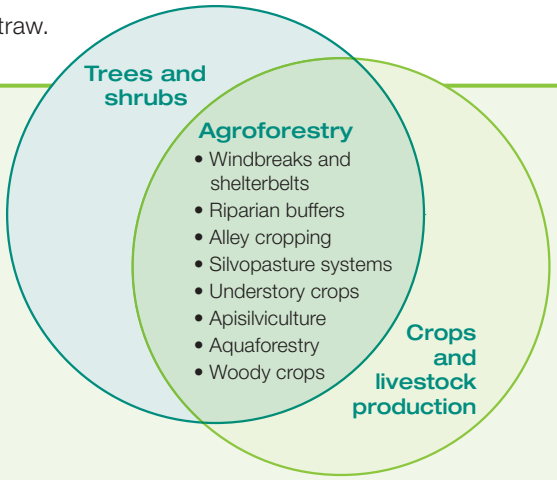
Agroforestry products are divided into two major groups: **1) timber forest products**, such as wood intended for construction, processing, and the pulp and paper sector, and **2) non-timber forest products (NTFPs)**. In Quebec, the markets for NTFPs are generally under-developed. This is not the case, however, for a number of better organized markets, such as blueberries, honey and ginseng.

Agroforestry produces a wide variety of NTFPs, which can be broken down into six product categories:

- **food products**, such as mushrooms and ginseng;
- **manufactured products**, such as essential oils;
- **health and beauty products**, such as drugs, shampoos and soaps;
- **decorative and aesthetic products**, such as Christmas trees and cones for crafts;
- **environmental products**, such as biogas and biopesticides;
- **horticultural products**, such as shrubs, wild flowers and straw.

Definition of agroforestry

Agroforestry is an integrated system of rural land resources management based on the deliberate combination of trees or shrubs with crops or livestock, whose interactions generate economic, environmental and social benefits.



Overview of Quebec agroforestry experiences

Quebec's vast territory includes large areas of agricultural land and forests, both private and public, available for the introduction of agroforestry practices. While some projects are carried out on a fairly large scale, others are being developed rather slowly, while yet others are still at an experimental stage. The support of educational and scientific resources as well as advisory bodies, both agricultural and forestry, is proving valuable for the implementation of such projects.

Windbreaks and shelterbelts

Windbreaks represent the most widespread agroforestry practice in Quebec. Since the mid-1980s, approximately 400 km of windbreaks and shelterbelts (extended windbreaks over an area larger than a single farm) have been planted annually in rural Quebec to protect crops, soil, livestock, buildings and roads from the harmful effects of wind. In the early 2000s, windbreaks began to be used to reduce odours from livestock buildings. Government programs and technical support from agricultural advisors undoubtedly contributed to the development of this practice.

Riparian buffers

Although less popular than shelterbelts, riparian agroforestry systems have been receiving increased attention over the past few years from a number of Quebec environmental and agricultural stakeholders. Such systems play an important role in streambank stabilization, water quality and habitat protection, maintenance of stream flows and carbon sequestration. As with windbreaks, they can generate both timber and non-timber forest products, while contributing to the aesthetics of the landscape and providing wildlife corridors.

Apiculture combined with tree species

Combining fruit production with apiculture is practiced on a large scale in Quebec. Placing beehives in blueberry fields in the Saguenay-Lac-Saint-Jean region is undoubtedly the most striking example. Pollination of 90% of the blueberry fields in this region is stimulated by placing hives in the blueberry fields through agreements between beekeepers and blueberry producers.

Understory crops

The cultivation of understory crops, particularly ginseng, mushrooms, bloodroot, Canada yew, goldenseal and wild ginger, is also a promising agroforestry practice in Quebec. It represents an attractive income diversification strategy in rural regions and reduces human pressure on the natural populations of native plants that grow in shaded environments. Although a growing number of producers are taking an interest in these crops, current production still remains relatively low in Quebec.

Alley cropping

The practice of growing an annual crop between rows of trees or shrubs is not well-known in Quebec. However, there is growing interest in this practice by the academic community, as attested by the establishment of three experimental sites in Montérégie and Mauricie. Other alley cropping sites have been established in the Gaspé Peninsula, notably at Val-d'Espoir (beans – elderberry) and in northern Gaspé (winter squash – serviceberry). Growing blueberries in clearings between large areas of forest is a method similar to alley cropping. This type of approach has been implemented in four regions in Quebec: Gaspésie–Îles-de-la-Madeleine, Saguenay–Lac-Saint-Jean, Côte-Nord and Mauricie.

Aquaforestry

Willow and poplar plantations have the capacity to remove phosphorus and other pollutants from various types of wastewater. The objective of this aquaforestry practice, which is still at the experimental stage, is to clean-up fish-farm effluents before they are discharged into natural rivers and streams.

Woody crops

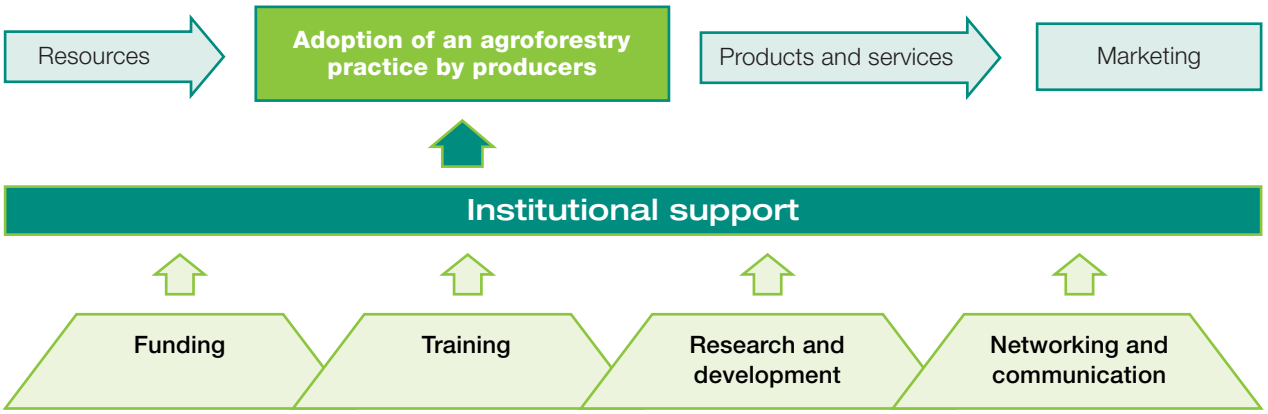
Short-rotation intensive silviculture is of interest to organizations in both the forestry and agriculture fields. In this type of production, willow seedlings, or seedlings of any other fast-growing woody species, are planted in the first year and then harvested, by cutting, in the following years. Cutting has the effect of promoting vigorous regrowth of the stems, thereby increasing production, which explains the lumber industry's interest in intensive silviculture. The woody material produced can be incorporated in particle board, for example, or used for energy production. Although not considered an agroforestry practice per se, short-rotation intensive silviculture offers definite potential for the reclamation of abandoned land and is therefore one of the technological options that should be considered on agricultural land in harmony with other types of agroforestry production.

Silvopastoral systems

The combination of livestock production and trees, which is called silvopasture, is still relatively unknown in Quebec. Nonetheless, three types of livestock production can take place in an agroforestry context: managed or natural woodlots that imitate the habitat of big game and increase the yield of this type of livestock production; woodlots integrated in pastureland to create shelter areas for cattle; and wintering livestock enclosures in the forest to improve the health of cattle during the winter.

Aiming for large-scale development

In order for an agroforestry project to be carried out, it must elicit the interest and commitment of producers. Various resources will be necessary to help producers complete their analyses, plan their project and proceed with its actual implementation. Producers will therefore need information, funding, various equipment, technical support and labour. And in order for producers to be able to realize a profit from agroforestry products, these products will have to be processed and marketed. Finally, the environmental and social benefits of the project must be vigorously promoted.



Agroforestry production

The current contribution of agroforestry to the environment and to the economy of Quebec's rural areas is definitely under-utilized. Some systems require more technical and economic knowledge, and training should be developed further. The recognition of agroforestry by institutions, whether through incentive programs or other concrete measures, is also essential for its large-scale development.

In order to be sustainable, agroforestry practices must be cost-effective, which depends, among other things, on the development of markets and better organization of supply. What are the main ingredients of a winning formula? Firstly, structured financial assistance and the establishment of a partnership that will actively support the process are essential. Secondly, it is also necessary to bring together the stakeholders currently involved in Quebec agroforestry. (See the table entitled "Key Stakeholders in Agroforestry," which provides an overview of the main stakeholders and their role in the development of agroforestry production.)

Taking up the challenge of agroforestry therefore calls for the creation of a partnership between the agricultural, forestry, land use and economic sectors. Government and industry stakeholders, as well as stakeholders from the education and research communities, are urged to pool their efforts to implement this ambitious undertaking called agroforestry, for the greater benefit of farmers, the environment, and society as a whole.

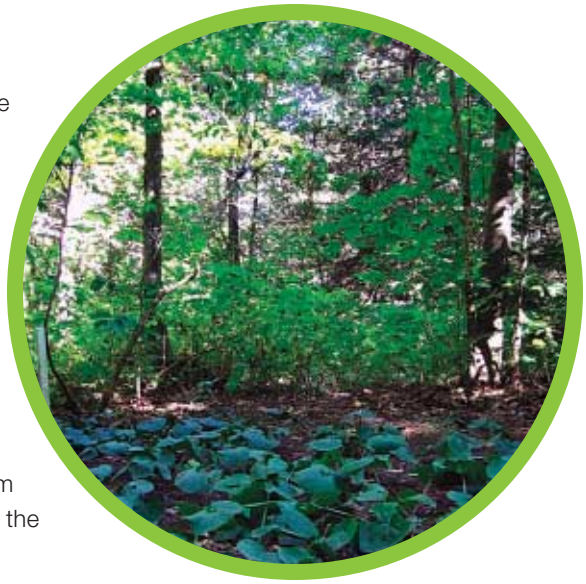
SOME EXAMPLES of successful AGROFORESTRY APPROACHES

Silviculture and agriculture, a winning combination?

Imagine! Rows of stately trees, red oak, red ash, white elm and white pine are established around the edges of agricultural plots or in the fields (alley cropping system), with sufficient space left between the rows to practice agriculture. Combining silviculture and agriculture on the same plots offers many advantages. This type of agroforestry system allows owners to add value to their land by planting trees while preserving an agricultural activity and maintaining vital rural communities. Initiatives of this type were implemented in the spring of 2006 by farmers in the Gaspé Peninsula. A network of experimental and demonstration plots was established in order to study the operation of agroforestry systems. Can agriculture and silviculture coexist on the same plot? Are the trees of good quality? The *Consortium en foresterie de la Gaspésie*, the Quebec Department of Agriculture, Fisheries and Food (MAPAQ) and the farmers themselves plan to monitor the progress of these systems over the next 10 years.

Understory crops, an added value to maple stands

How can you generate two revenue streams from the same maple stand? In early 2006, 10 maple producers in the RCM of L'Islet, in the Chaudière-Appalaches region, had the innovative idea of growing native medicinal plants in their maple stands. Four plants – ginseng, wild ginger, bloodroot and goldenseal – were planted in maple stands, their natural habitat. To carry out this project, the maple producers obtained funding from the *Programme de mise en valeur des ressources du milieu forestier* of the Quebec Department of Natural Resources and Wildlife (MRNF), as well as technical support from the *Centre d'expertise sur les produits agroforestiers* (CEPAF). The best part of this arrangement is that the high commercial value of the medicinal plants could allow producers to increase the revenues from their maple stands without having to invest a lot of time in monitoring the crops. What more could you ask for?



When agroforestry lends a hand to the hog industry

Could shelterbelts around hog barns provide a solution to odour problems? Properly designed shelterbelts planted adjacent to hog barns appear to offer significant advantages from both an environmental and economic standpoint, such as controlling odours and reducing heating costs. A project aimed at promoting the establishment of shelterbelts to control odours was carried out by the *Fédération de producteurs de porcs du Québec* (FPPQ) and the *Institut de technologie agroalimentaire*, La Pocatière campus, from 2001 to 2004, during which agricultural advisors from Montérégie, Lanaudière and Chaudière-Appalaches received 75 hours of training. In addition, nine demonstration sites were established on hog farms in these three regions. A web site was created and an agricultural extension document was published and distributed throughout Quebec. Since then, the Canadian Pork Council has exported the project to other regions of Quebec, Ontario and the Maritimes through the Greencover Canada Program.

Key agroforestry stakeholders

	Funding or systems	Technical assistance	Professional training	R&D and technology transfer	Marketing	Structural development funding
Forestry agencies						●
Agriculture and Agri-Food Canada	●			●		●
Natural Resources Canada – Canadian Forest Service				●		●
Centre d'expertise sur les produits agroforestiers				●	●	
Agri-environmental clubs		●		●		
Conseil pour le développement de lagriculture du Québec	●					●
Fondation de la Faune du Québec	●					●
Groupe interdisciplinaire de recherche en agroforesterie and Laval University			●	●		
Institut de recherche en biologie végétale of the University of Montreal			●	●		
Institut de technologie agroalimentaire, La Pocatière campus			●	●		
L'Union des producteurs agricoles					●	●
Quebec Department of Agriculture, Fisheries and Food (MAPAQ)	●	●	●	●		●
Quebec Department of Natural Resources and Wildlife (MRNF)	●	●	●	●		●
Syndicat des producteurs de bois		●			●	

This document is a simplified version of the report entitled *Le portrait de l'agroforesterie au Québec*, a collaborative effort of Agriculture and Agri-Food Canada – Prairie Farm Rehabilitation Administration, Natural Resources Canada – Canadian Forest Service, the *Centre d'expertise sur les produits agroforestiers* and the *Institut de technologie agroalimentaire*, La Pocatière campus. Through its Regional Services, the Prairie Farm Rehabilitation Administration (PFRA) delivers support to the Environment chapter of Canada's Agricultural Policy Framework.

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