FOREWORD

This book is Volume 1 of a two-volume set on agroforestry.

▶ Volume 1, *Woodlot Management,* addresses the management of existing woodlots, including established plantations.

▶ Volume 2, *Establishing Tree Cover,* addresses the planning and establishment of agroforestry plantings. This title will explore the following types of plantings:

▷ afforestation (plantings in fields)
▷ windbreaks and shelterbelts
▷ treed buffer strips
▷ intercropping
▷ silvipasture.

Printing of Volume 2 is planned for 2008.

Related titles in the Best Management Practices series, especially *Fish and Wildlife Habitat Management* and *Buffer Strips,* may be helpful to you. Instructions for getting copies of these titles are on the previous page.

The general agroforestry principles described in this book are mainly applicable to areas south of the Canadian Shield.

Words that appear in the glossary on page 143 are italicized at first mention.

Thank you, and we hope you find this book helpful in making the most of your woodlot.

BEST MANAGEMENT PRACTICES
Agroforestry Series Volume 2

Establishing Tree Cover

Canada
Ontario
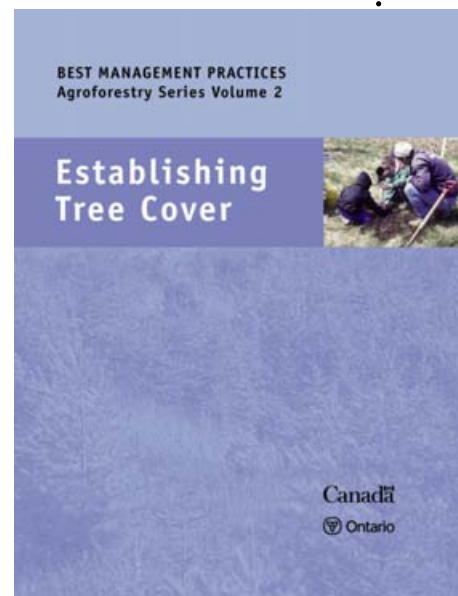
INTRODUCTION

FARMING AND FORESTRY

Forest crops have been used by farmers since the first days of settlement. Even before all of their land was cleared, many settlers were producing their own maple sugar. Trees provided logs and lumber for homes and farm buildings, fence rails to contain livestock, and an ample supply of fuelwood to fend off winter's cold.

Since settlement, farmers' attention has been focused primarily on the business of food production – in the fields and in the barns. Woodlots have been more peripheral, except perhaps as a source of firewood.

But in recent years, the worlds of farming and forestry have become reacquainted. As margins in food production grow ever tighter, many farmers are looking to reduce their own costs and diversify their sources of income.

At the same time, they recognize that the value of a woodlot is not only measured in dollar signs. Air, water and soil quality, wildlife habitat, and aesthetic and recreation opportunities are all beneficiaries of a well-managed woodlot. Agroforestry may serve as an effective alternative to more conventional land use practices, particularly on sensitive soils and marginal agricultural lands.

Which brings us to the topic of this book. Woodlots obviously differ from field crops. There is a learning curve in terms of knowing what you have, and what, when and how much to harvest, and how to attain long-term sustainability and environmental enrichment.

The good news is that agroforestry integrates the land use practices of agriculture, animal husbandry, and forestry within a given landscape or farm. It produces while conserving resources of the land on which that production depends. This book will show you how, by:

▶ explaining the principles of farm woodland management
▶ describing best management practices for woodlots and plantations
▶ highlighting new opportunities
▶ providing links to key contacts and more information.

For each woodland type and endeavour, the costs and benefits of each best management practice will be laid out to help you choose the best option for you. The impacts on soil, water, air, and habitat will also be presented.

If agroforestry is fairly new to you, you may find some new terminology. *Italicized* words are defined in the glossary on page 143.

Forests have been used by farmers since the early days of settlement.

In agroforestry, trees, shrubs and small woodlots are counted as part of a farming system that promotes sustainability.

THE ENVIRONMENTAL FARM PLAN DEFINES AGROFORESTRY THIS WAY:

Farm forestry (agronomy and forestry): Practices that bring trees into farm operations and allow for the production of crops, livestock, and trees while obtaining extra benefits from the land. These practices include woodlot management, naturalized habitats, *plantations,* windbreaks, and trees on streambanks.

Windbreaks significantly slow wind speed over fields, and in so doing reduce soil erosion.

Treed fencerows serve as natural shelterbelts, travel corridors for wildlife, bird habitat and sources for products such as fuelwood.

Forests found in floodplains and ravines protect riparian areas and, with care, can be managed for valuable wood products.

Farm woodlot

Sugar bush

Conifer plantation

Treed fencerow
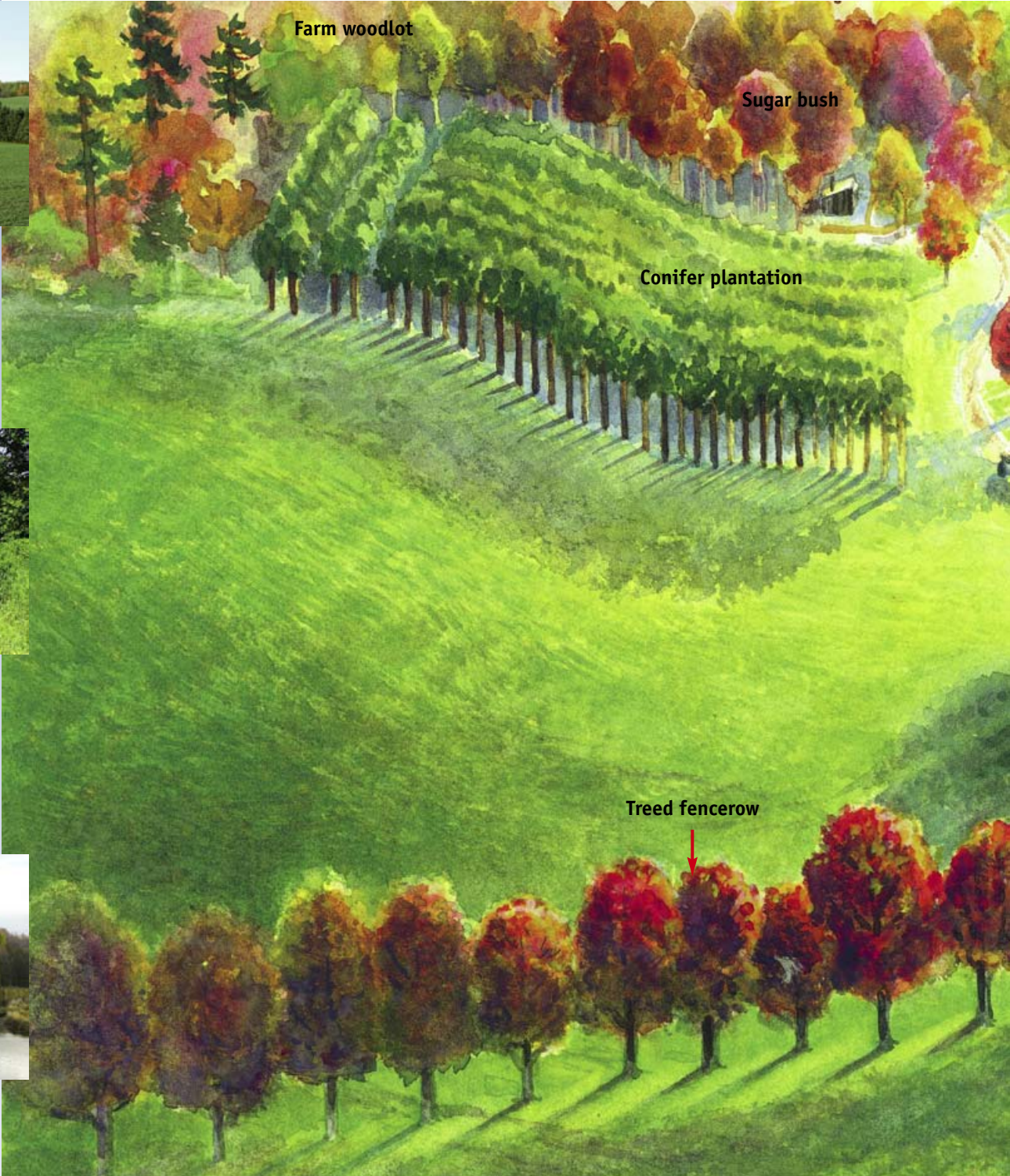
Agroforestry practices offer Ontario's farmers and rural landowners a range of opportunities, by generating saleable crops and other products for farm use, and by beautifying their property.

Riparian forest

Windbreak

Shelterbelt

Treed buffer strip

To reap the most benefits of your farm woodlot, you need to know what you have, and when, what and how to harvest.

A plantation can provide valuable forest products.

Buffer strips protect water bodies.

BENEFITS

Livestock can benefit from the shade of trees on the farm.

Tree planting can be an enjoyable family activity that provides many long-term benefits on the farm.

Well-planned forestry operations can provide the owner with a continuous supply of fuelwood and timber products.

Much of the value of fencerows, woodlots and trees on the farm is intangible. Most often it is tied to your favourite memories: making maple syrup in the sugar bush, hunting the fencerows for rabbits, grouse and turkey, seeing young fawns in the meadow, or heating the farmstead with wood from the woodlot.

POTENTIAL BENEFITS OF AGROFORESTRY

ECONOMIC	ENVIRONMENTAL
• diversified farm income • energy savings • significant opportunities for generating products for farm use (see next section) • opportunities for farm labour	• decreased water and wind erosion • improved soil quality • increased biodiversity of plants and animals • healthier riparian and other natural areas • sequestration of carbon and reduced effects of greenhouse gases

Plantations can be thinned to generate wood products for sale or farm use.

Managing woodlands can diversify farm income by harvesting and selling high value timber products.

Trees and forests provide much-needed habitat for nesting birds and other wildlife species.

Farm woodlands offer numerous opportunities to diversify farm sales.

Non-wood forest products such as cedar boughs can also be harvested from woodlands.

Riparian forests should be managed to protect water quality and wildlife habitat.

Two key benefits of agroforestry to farmers are the convenience and cost savings enjoyed by having their own woodland and tree crops for use on the farm. The value of these crops and all other agricultural commodities produced on farms and consumed by individuals living on these farm operations is referred to as *income in-kind.*

Many farm fences are made from materials harvested and processed from woodlots owned by the farmer.

Today many woodland owners continue to use forest crops grown on the farm. Statistics for various farm products consistently show that forest products provide the largest income in-kind benefit to farmers of all the commodities produced on the farm. From 1999 to 2003, the average value of forest products used on Ontario farms amounted to 77% of the total value of all products produced and used at home. In 2003 the income in-kind value for forest products was just over $29 million.

CHALLENGES

Agroforestry presents its own set of challenges, including: getting started, potential or perceived conflicts with the production of agricultural products, and the costs. These have all served to slow the wide-scale implementation of agroforestry practices.

Some see wind-breaks as obstacles to field operations and crop yields. In truth, windbreaks improve net yield and protect the soil.


A study was conducted in southwestern Ontario to compare returns on croplands with well-managed woodlands. The results showed an average return of $222.00/ac/yr for a woodlot and a return of $107/ac/yr for field crops. Soil and climate conditions were identical.

BARRIER TO ADOPTING AGROFORESTRY PRACTICES	POTENTIAL
PLANTING TREES WILL REDUCE PRODUCTIVITY ON MY LANDS.	Trees should be planted on lands that will not negatively impact the existing farming operations. See page 100 for help with determining whether to plant trees, and if so, where.
TREES WILL INTERFERE WITH MY OPERATION.	For the most part, trees benefit farm operations. Woodlands and windbreaks will reduce crop performance in the portion of the cropland nearest the trees, but will improve the net yield of protected cropland up to 20%.
TREES ON THE FARM WILL ATTRACT PROBLEM WILDLIFE.	In some areas, wildlife damage to crops can be a problem. Information is available on controlling problem wildlife. Bear in mind that trees can also provide habitat for beneficial wildlife that can help control problem insects and rodents.

AGROFORESTRY'S POTENTIAL IN ONTARIO

With just over one million square kilometres, Ontario offers a diversity of landform and climate that affects not only the distribution of native plant and animal species, but also the type and intensity of agriculture practised within it. This landscape and climatic variability from north to south and east to west also influences the opportunities for agroforestry.
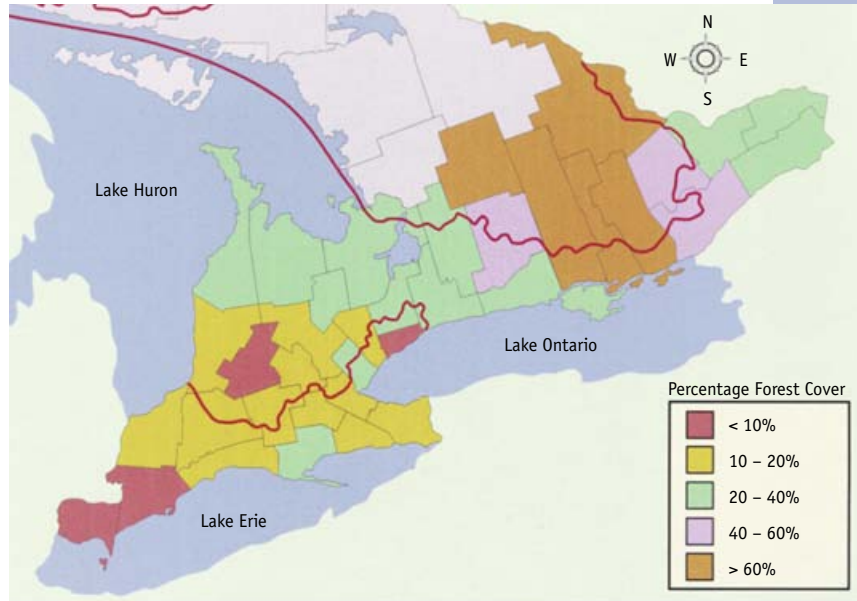
This book focuses on Site Regions 6E and 7E. A site region is an area with relatively uniform climate, soil, plants, animals and other organisms interacting to produce a recurring pattern of forest cover types. For example, Sugar Maple–Beech is a more common cover type of Site Region 6E. In Site Region 7E, Red Oak–Hickory–Ash is a more common cover type.

Ontario has approximately 900,000 hectares (2.23 million acres) of marginal farmland, a portion of which is managed for pasture. Some of this land would be suitable for tree crop production of one kind or another. When you combine this with the over 4.7 million hectares (11.6 million acres) of existing woodlands and plantations, you can appreciate the great opportunity for farmers and rural landowners to participate in agroforestry practices.

Harvesting low-value, low-quality trees for firewood improves growing conditions for remaining trees, including valuable *crop trees*.

Planting trees in the 1930s helped reduce wind erosion in many areas of Ontario. Many of these forests are now owned by municipalities.

Owls, hawks, snakes and foxes will use tree cover to hunt for mice and rats.