

Eco-Buffers

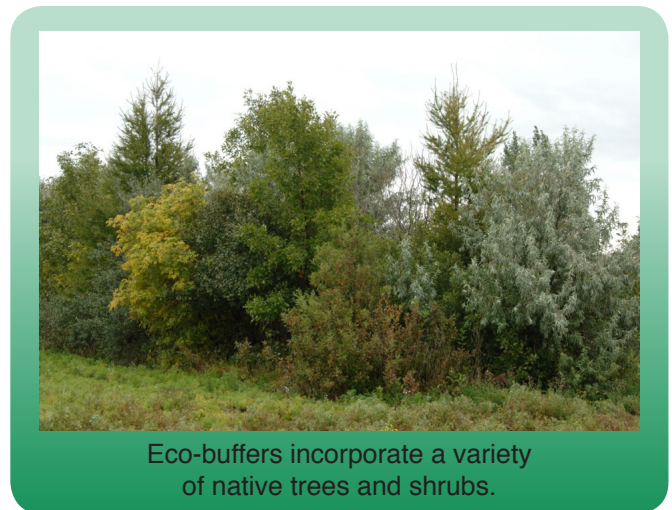
An alternative agroforestry design

Shelterbelts, hedgerows, wetlands and other 'natural' areas in agricultural ecosystems reduce soil erosion, sequester carbon, protect land and water resources, provide important habitat for beneficial insects (pollinators, natural enemies of pests, etc.), enhance biodiversity and improve crop productivity. These functions are important components of a sustainable system that can contribute to a producer's bottom line.

Agroforestry specialists at Agriculture and Agri-Food Canada (AAFC) have been researching multi-function/ multi-species tree planting designs, particularly for along field boundaries and riparian zones. The designs are modeled after local vegetation communities such as grasslands, forests, and remnant field margins. The intent is to mimic the benefits of the larger, diverse natural buffers in smaller, narrower spaces. The AAFC field boundary design is fittingly named ecological buffer (eco-buffer).

Eco-buffers are made up of multiple rows using variety of native trees and shrubs in a mixed planting arrangement. Unlike most traditional single or few species shelterbelts, There is a much higher variety of woody plants in an eco-buffer. The plants are predominantly native trees and shrubs chosen from the ecozone where the eco-buffer will be planted. The plants include long and short lived trees and shrubs with a variety of characteristics like suckering, thorniness, fast or slow growth rates, fruiting, and early or late flowering. Furthermore, each row in an eco-buffer is a mixture of trees and shrubs, whereas each row in a traditional shelterbelt is usually a single species.

Another key difference is plant density: an established eco-buffer can average over 5000 plants per 100 meters compared to just 350 plants in the same space for a traditional shelterbelt. This is due to both a much closer spacing (1 meter/3 feet between all plants including between trees) and extensive suckering of some shrub species. One benefit is that the high plant density reduces the need for long-term weed control.



Key features of eco-buffer designs:

- ▶ Self-regulating and resilient
- ▶ Structurally more complex than traditional multi-row, single/few species shelterbelt designs
- ▶ Establish quickly, eliminating the need for long term weed control
- ▶ Trees and shrubs are well adapted to the local environment
- ▶ Plant growth and survival are not affected by narrow spacings in the buffer design
- ▶ Provides good habitat for birds, mammals, and pollinating insects



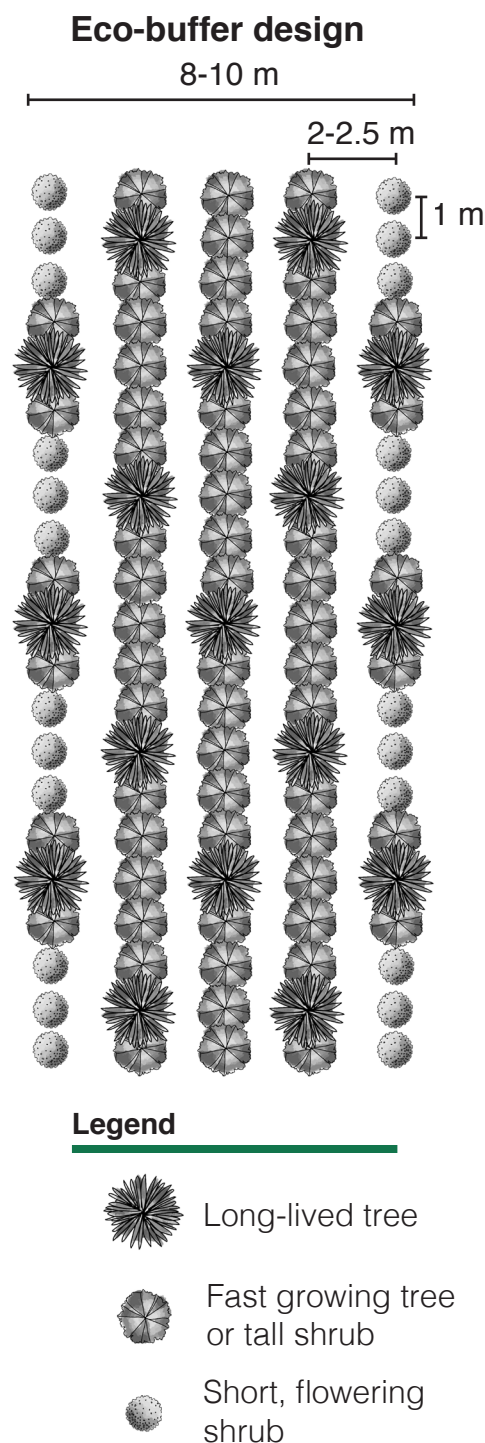
Eco-buffers can be located anywhere a traditional shelterbelt would be planted or where a natural hedgerow may have existed. They can also be used to supplement or rehabilitate existing natural hedgerows or to connect natural habitats such as wetlands, riparian zones or wooded area. Eco-buffers can also provide a source of wood and non-timber forest products (e.g. fruit or mushrooms).

Fundamental eco-buffer design

- Plants are native to the ecoregion
- Incorporates a variety of trees and shrubs with different characteristics (e.g. thorns, suckering, fast and slow growth rate, fruiting, varying flowering period, long and short lived)
- End result is a layered structure with variable tree and shrub heights
- Design is adaptable to suit a variety of situations and spaces: interior rows can be removed from the basic 5-row design to create a narrower 3- or 4-row design

Rules

- Within-row spacing: 1 meter (3 feet) [all plants]
- Between-row spacing: 2-2.5 meters (6-8 feet)
- Trees:
 - One long-lived tree every 6th plant in a row
 - both fast and slow growing species
 - 10-20 meters (30-60 feet) tall at maturity
- Shrubs:
 - A minimum of 4-5 shrub species
 - 1-5 meters (3-15 feet) tall at maturity
 - Taller shrubs are planted in interior rows
 - Shorter flowering species on outside rows



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