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Agriculture and Agri-Food Canada

Agriculture et Agroalimentaire Canada

Evaluation of native trees and shrubs planted on berms

December 2009

Collaborators: Webster Farms, Bedeque Bay Environmental Management Association and Summerside Air Cadets

Location: Maple Plains

Introduction: As part of soil conservation practices in PEI, potato producers construct diversion terraces consisting of a grassed waterway and a raised mound (berm) of soil on the downward slope side of the waterway. The whole diversion terrace is then seeded to grass. Every year, producers mow the berms to reduce the spread of weeds. To reduce this problem and to eliminate the mowing requirement, this project was started the spring of 2005 to evaluate native trees and shrubs planted on a berm. The project ran from the spring of 2005 to the fall of 2009.

Treatments: 13 treatments were established consisting of 3 native trees (white birch, elm and red oak) in combination with or without 3 native shrubs (highbush cranberry, beaked hazelnut and red osier dogwood) as well as a control consisting of no shrubs or trees. The treatments were replicated 3 times.



Soil Analysis

Organic matter :	3.3%
pH :	5.9
Phosphate :	541 ppm
Potash :	262 ppm



Red Oak fall 2008



High bush cranberry fall 2008



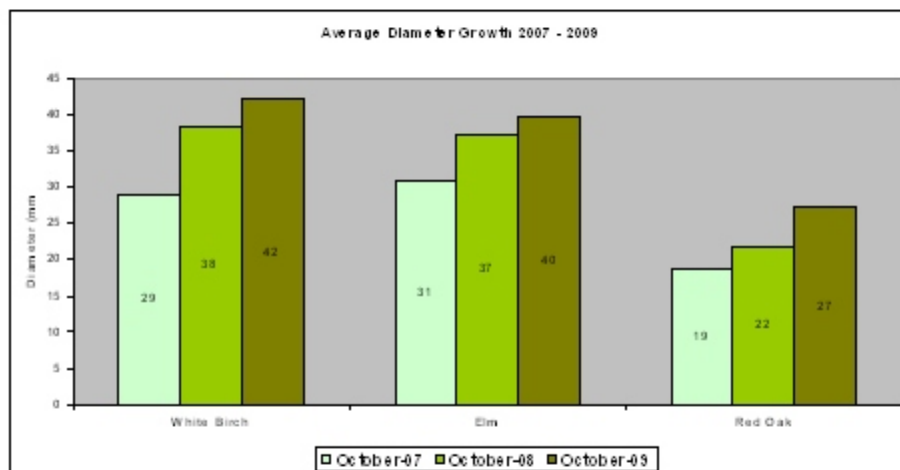
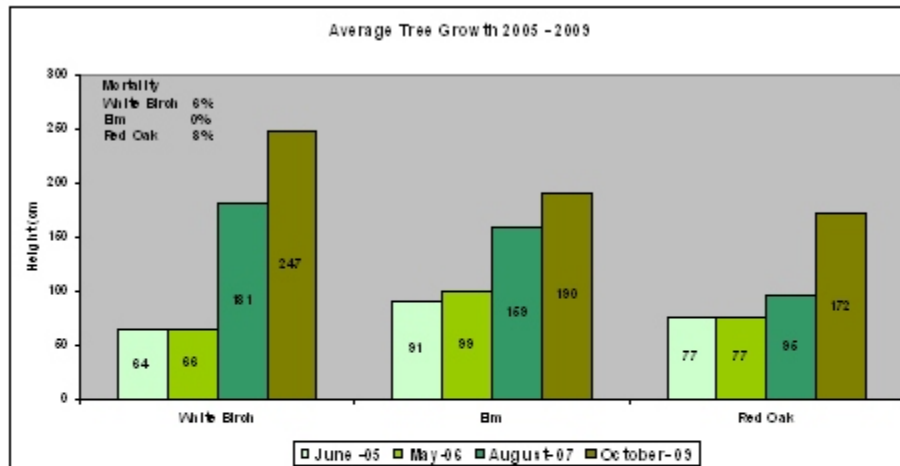
White birch fall 2008



The Soil Conservation Council of Canada



Results



Results

Trees: The graphs above show the average height and diameter (measurement taken 1" above ground level) for the three tree species in the experiment.

White birch has had the best growth rate going from an average height of 64 cm at planting in 2005 to 247 cm in the fall 2009. Average diameter increased from 29mm in 2007 to 42 mm in 2009. The mortality rate was 6% or 2 plants out of 36.

Elm's average height increased from 91 cm at planting in 2005 to 190 cm the fall of 2009. Average diameter increased from 31 mm in 2007 to 40 mm in 2009. The mortality rate was 0% as no Elm trees died during the 5 years of the experiment.

Red Oak's average height increased dramatically between 2007 and 2009. From planting in 2005 to August 2007, average height increased by about 18 cm but between August 2007 and October 2009 average height increased by 77 cm. Average diameter increased from 19 mm in the fall of 2007 to 27 mm in October 2009. The mortality rate was 8% or 3 plants. However, red oak has shown that if the main stem dies, the plant may regenerate from its roots. This occurred in 4 of the 5 plants that were thought to be dead in May 2006.

Shrubs: No measurement data was collected for the shrubs. Observation taken in October 2009 indicate that some of the shrubs varieties had severe damage from rodents. Approximately 30% of the beaked hazelnut have survived while about 65% of the highbush cranberry are present. Red osier dogwood does not seem to be affected by mice. Not only are 100% of the plants alive, they are starting to spread into adjacent areas of the berm.

Observations

Tree survival on a berm is feasible but producers should be aware of several items. First, the largest available trees should be planted in order to compete against the naturally occurring weeds and grass. Landscape fabric and/or mulch should be applied around the base of each plant to reduce the competition from weeds for at least the first three years. Second, protection from mice/rodents for the winter months is required for at least the first three years. In this project, aluminum foil was wrapped around the base of each plant in the fall and removed in the spring. An alternate method for producers may be the use of poison to prevent rodent damage but care must be taken to ensure that other animals cannot access it. The poison traps must also be restocked each fall. Third, shrub plants do survive but maintenance of the berm would have to be done on a regular basis in order to permit the harvesting of fruit. Weeds and grass should be less of a problem as the trees and shrubs mature and the weed and grass population is reduced. However, this was not obvious after 5 years.



Rodent damage spring 2006



Protecting trees from rodents with tinfoil



Planting shrubs, June 2005

