From Forest Nursery Notes, Winter 2011

76. © A retrospective and lessons learned from Natural Resources Canada's Forest 2020 afforestation initiative. Dominy, S. W. J., Gilsenan, R., McKenney, D. W., and Allen, D. J. Forestry Chronicle 86(3):339-347. 2010.

A retrospective and lessons learned from Natural Resources Canada's Forest 2020 afforestation initiative

by S.W.J. Dominy[1,2], R. Gilsenan[3], D.W. McKenney[1], D.J. Allen[1], T. Hatton[3], A. Koven[4], J. Cary[4], D. Yemshanov[1] and D. Sidders[5]

ABSTRACT

Canada is seeking cost-effective means to mitigate anthropogenic greenhouse gas emissions, particularly CO_2, that have been linked to global climate change. In 2003 the Government of Canada launched the Forest 2020 Plantation Development and Assessment Initiative to assess the potential for fast-growing woody crops to sequester carbon from the atmosphere. Across the country 6000 ha of plantations were established and monitored on nonforested lands (afforestation) using a variety of methods. Economic analyses assessed the investment attractiveness of this mitigation measure for a range of species and suitable lands, taking into account such factors as growth rates, agricultural opportunity costs and a range of possible carbon values. Analyses illustrated that at current trading prices for carbon and for much of the available lands and expanding markets for forest bioproducts, expected rates of return on investment for afforestation were relatively low. However, higher future carbon prices, combined with monetary values for environmental benefits, could dramatically change the economics of afforestation in the future.

Key words: afforestation, carbon sequestration, forest carbon offset project, climate change mitigation, policy analysis, risk analysis, forest investment analysis, hybrids, hybrid poplar, fast-growing trees

RÉSUMÉ

Le Canada est à la recherche de moyens pour réduire les émissions de gaz à effets de serre issues de l'activité humaine, notamment le CO_2, qui ont été reliées aux changements climatiques de l'ensemble de la planète. En 2003, le Gouvernement du Canada a lancé le Programme d'évaluation et de démonstration de plantation de Forêt 2020 dans le but d'évaluer le potentiel d'utilisation des plantations d'arbres à croissance rapide pour piéger le carbone contenu dans l'atmosphère. Dans l'ensemble du pays, 6 000 ha de plantations sur des terrains non boisés (boisement) ont été créés et ont fait l'objet de suivis selon différentes méthodes. Des études économiques ont permis d'évaluer les incitatifs financiers rattachés à cette mesure de réduction des gaz dans le cas de différentes espèces et de divers terrains propices au boisement, en prenant en considération des facteurs comme le taux de croissance, les coûts d'opportunité agricole et un ensemble de valeurs possibles du carbone. Les études ont indiqué que selon les valeurs actuelles de transaction du carbone, de la plupart des terres disponibles et des marchés en progression des bioproduits forestiers, les taux attendus de retour sur l'investissement dans le cas de boisement étaient relativement faibles. Cependant, des valeurs plus importantes du carbone dans l'avenir associées à la valeur monétaire des bénéfices environnementaux, pourraient modifier de façon importante l'aspect économique du boisement.

Mots clés : boisement, piégeage du carbone, projet forestier de piégeage du carbone, mesure d'atténuation des changements climatiques, étude des politiques, analyse du risque, analyse des investissements forestiers, hybrides, peuplier hybride, arbres à croissance rapide

Introduction

Global climate change is one of the most important environmental, social and political challenges facing society today. Anthropogenic disturbances to the global carbon cycle—particularly the burning of fossil fuels—have led to increased concentrations of greenhouse gases in the atmosphere. Scientists predict that these increases will lead to significant regional and global changes in climate and climate-related parameters such as temperature, precipitation, drought, soil moisture, and sea level (Houghton et al. 2002).

Forests cycle carbon dioxide (CO_2), an important greenhouse gas (GHG), through the processes of photosynthesis, respiration, decomposition, and emissions associated with disturbances such as fire, insects, and timber harvesting. The carbon sequestration potential of forests was recognized in the Kyoto Protocol, thus allowing forestry activities such as afforestation to contribute to Canada's efforts to achieve Kyoto targets.

With continually increasing demands on the forest to supply non-timber benefits, meeting future societal demands for wood fibre will require deriving higher yields from the relatively small area of land available for plantations. One means to achieve this goal is to establish and intensively manage fast-growing tree plantations on currently unforested, underutilized agricultural lands (i.e., afforestation) capable of producing wood more quickly than natural forests. Internationally,

[1]Natural Resources Canada, Canadian Forest Service, 1219 Queen St., Sault Ste. Marie, Ontario P6A 2E5.
[2]Author to whom correspondence should be addressed.
[3]Natural Resources Canada, Canadian Forest Service, 580 Booth St., Ottawa, Ontario K1A 0E4.
[4]Trees Ontario, 200 Consumers Road, Suite 701, Toronto, Ontario M2J 4R4.
[5]Natural Resources Canada, Canadian Forest Service, 5320 - 122 Street, Edmonton, Alberta T6H 3S5.