Proceedings:
Canadian Forestry Service Hardwoods Management Workshop

Petawawa Forest Experiment Station
September, 1974

Environment Canada | Environnement Canada
Forestry Service | Service des Forêts

PROCEEDINGS:
CANADIAN FORESTRY SERVICE
HARDWOODS MANAGEMENT WORKSHOP

Petawawa Forest Experiment Station
24-26 September, 1974

Edited by
W.M. Stiell
FOREST MANAGEMENT INSTITUTE
OTTAWA, ONTARIO

ENVIRONMENTAL MANAGEMENT SERVICE
DEPARTMENT OF THE ENVIRONMENT
1974

PATHOLOGY OF HARDWOODS IN RELATION TO STAND TREATMENT

by

D. Lachance

RESUME

L'étude 043 intitulée "Pathologie des arbres feuillus en relation avec les traitements des peuplements" s'inscrit dans les cadres du projet LFRC-8. Elle comprend deux objectifs principaux qui permettent facilement l'inclusion ultérieure d'ojectifs additionnels plus spécifiques. Un premier objectif consiste à évaluer l'état pathologique actuel et prédire la valeur d'avenir d'arbres individuels. De telles données sont requises lors de la sélection d'arbres dans les coupes partielles. Un deuxième objectif tente de relier à une ou plusieurs causes générales (historique ou ambiante) l'état pathologique d'un peuplement ou la présence d'une maladie à l'intérieur d'un peuplement. De telles données sont requises pour choisir convenablement la direction que doit prendre l'aménagement d'une forêt donnée ou pour définir des traitements sylvicoles à appliquer ou à éviter. A date, seule une expérience restreinte a pu être entreprise sur des bouleaux jaunes situés dans des peuplements soit fertilisés à 0, 100 ou 200 livres d'azote à l'acre, soit éclaircis à 0, 20 ou 40% de leur surface terrière originale, soit une combinaison de ces traitements. Des blessures uniformes faites sur les troncs d'arbres situés dans ces peuplements devraient nous permettre d'évaluer l'effet de ces traitements sur la vitesse de cicatrisation des arbres impliqués.

INTRODUCTION

Hardwoods are susceptible to several severe and often devastating diseases. One has just to think of Dutch elm disease, beech bark disease, birch dieback and so on, to consider what may be the fate of a hardwood stand in terms of total growth or fibre production. On a tree-by-tree basis, however, stains and decay (generally originating from wounds) cause the most concern to forest managers. Although it is questionable how much growth rate is affected by these stains and decays, quality and net wood production are evidently severely reduced by them. Then, how do we look at pathology in a hardwood stand?

Should we preserve the stand first and give second consideration to quality? Or should we aim for high quality wood first, even sometimes at the expense of occasional reduction in total wood production? Or should we try to achieve the maximum in both; that is, highest quality of wood in a highly productive stand? Evidently we should normally aim for the third option. But what are the pathological choices given us?

It is not my role here to discuss the costs involved and benefits expected by choosing one alternative over the other, but as a pathologist I would like to know to what extent pathological knowledge of individual trees will be needed and be useful. This will help me to determine what parameters to note and how best to collect my data, to best ensure the eventual application of the results of a pathological study.

OBJECTIVES

Within the project LFRC-8, I am the study leader of Study 043, "Pathology of Hardwood Trees in Relation to Stand Treatments". Two main objectives have been set, pending the need to study definite

problems arising from experiments planned or already going on. The first one is "to study and evaluate the pathological condition of hardwood trees". This relates to individual trees and seeks to establish a future value for a tree (according to the projected use) based on its present pathological condition. In fact, it is more or less a continuation of the work mentioned yesterday by Dr. Lavallée; that is, his classification of yellow birch and sugar maple according to a relative future quality rating of individual trees. This study could either add details to the present classification of these two species or, most probably, involve the establishment of the same type of classification for other species. I may add here that, for a given species, such a study could probably be completed in one or two years provided additional labor (and thus additional money) is allocated, especially during summer seasons.

The second objective of this study relates to the evaluation and attempted control of tree defects. Here I am looking at a stand condition rather than at the individual tree. Thus, I would attempt to give answers to questions like "Why are there so many cankers in this sugar maple stand when there is practically none in that one"? Or "What is the extent and importance of the damage done to the remaining stand after selective hardwood cutting has been made, either with a particular piece of machinery or according to a particular stand treatment"? It would be harder to set a definite term to the length of a study with such an objective, but many results and strong indications of what to expect of the future of a treated stand should be available after about 5 years from the beginning of the study.

METHODS

What we have been able to undertake so far in this study is quite restricted. This year, as we had very little time to give to hardwood studies, we simple made a standard wound, taking 25 cm^2

circular pieces of bark from yellow birch trunks, situated in sample plots which had respectively, 0, 20% and 40% of their basal area thinned in 1969-70, fertilized with 0, 100 and 200 pounds of nitrogen (as urea) in 1971, and combinations of the two treatments. As the majority, and the most important, of the wounds following almost any treatment in a stand involve bark-peeling from tree trunks, we hope with this small experiment to see if thinning, fertilization or what combination of the two, increases most the healing capacity of the trees. Sugar maple was also considered in this experiment but the number of stems available in the treated areas was not sufficient to warrant doing anything this year.

DISCUSSION

Sugar maple has more defect at Valcartier FES than it does in the Eastern Townships.