Not for Publication

CANADA

Department of Forestry

FOREST RESEARCH BRANCH

PROGRESS REPORT

PROJECT P-605

EQUILIBRIUM MOISTURE CONTENTS OF SEVERAL SPECIES OF CONIFEROUS AND DECIDUOUS LEAF LITTER AT VARIOUS TEMPERATURES AND RELATIVE HUMIDITIES

by

C.E. Van Wagner

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Project Number: P-605

Title: Equilibrium moisture contents of several species of coniferous and deciduous leaf litter at various temperatures and relative humidities.

Oxford Classification: 431.2

Investigator: C.E. Van Wagner (formerly W.A. Hannaford)

Previous Reports: W.A. Hannaford:

April 1959 - Project plan
September 1959 - Progress Report

C.E. Van Wagner:

January 1961 - Project continuation plan
January 1962 - Progress report

Purpose

The purpose of the project is apparent from the title. Equilibrium moisture contents (E.M.C.'s) are required in any study of drying phenomena, and are useful in empirical fire danger work.

Progress

The history of this project is mainly a story of two particular difficulties: (1) achieving good measurement and control of the relative humidity in the Weyco Climate Chamber, and (2) devising a method that properly accounts for the hysteresis between the drying and wetting halves of the cycle.

The first two sets of results were essentially invalid because of these difficulties, but the data now being collected are believed to be satisfactory. E.M.C.'s are being determined of the following materials:

(1) jack pine needle litter
(2) white pine " "
(3) red pine " "
(4) trembling aspen leaf "
(5) match splints (white pine)

The relative humidities in the test cycle are: 25, 40, 60, 80, 90, and 95 per cent. Two cycles, one at 80°F, and one at 100°F have been completed with the latest technique and cycles at 60°F and 120°F are scheduled. At each temperature-humidity combination a pair of values is obtained, one by wetting from a lower moisture content, the other by drying from a higher moisture content.

So far the three pines appear to have about the same E.M.C, while aspen runs a little higher and the match splints a little lower. The E.M.C.'s at 95 per cent relative humidity are about three times the values at 25 per cent, but temperature variation within the range 60° to 120°F at constant humidity has relatively less effect.

The chances of completing the laboratory work in 1963 are good — if so, a final report will be written in the first half of 1964.