CANADA
Department of Northern Affairs and National Resources
FORESTRY BRANCH

# SUSCEPTIBILITY OF CERTAIN TREES OF EASTERN ONTARIO TO BASAL BARK SPRAYS

by

E. S. Atkins



Forest Research Division
Technical Note No. 38
1956

Published under the authority of
The Minister of Northern Affairs and National Resources
Ottawa, 1956

## CONTENTS

# Susceptibility of Certain Trees of Eastern Ontario to Basal Bark Sprays

by

E. S. Atkins[1]

## INTRODUCTION

The removal of overmature, unmerchantable, diseased, or "wolf" trees in a forest stand is an accepted silvicultural practice. Such trees constitute a drain on the site, and the cost of their removal is often greater than the financial returns. If left, they may prevent the establishment of seedlings or retard the development of a new stand. As a result, the full capacity of the site may not be utilized. This situation exists in many extensively managed forests in Eastern Ontario, particularly where large hardwoods constitute part of the stand.

The conventional methods of removing these undesirable trees have been by felling, by girdling, or by girdling and applying a poison such as an arsenic compound. These methods are laborious and arsenic is dangerous to the user.

In recent years, spraying the base of the tree with 2,4,5-T or a mixture of 2,4-D plus 2,4,5-T has been tested and found to be toxic to certain species in the United States. No cutting or girdling is necessary before application, a feature which is a distinct advantage in comparison to older methods.

A number of tests were made with basal bark sprays at the Petawawa Forest Experiment Station, Chalk River, Ontario, in 1951-52. Two chemicals were tested in spring and autumn treatments on eight species native to the region. The purpose of these tests was to determine the susceptibility of the species concerned, to compare the effectiveness of the two chemicals, and to ascertain the difference, if any, between spring and autumn treatments.

## METHODS AND MATERIALS

Spraying the basal 12-18 inches of the tree with a concentrated solution of herbicide in deisel oil is recommended by the manufacturers. A liberal application is necessary, the spray being applied until it begins to run down the bark. If it is desired to prevent or delay sprouting from the base of the tree, all exposed bark close to the ground must be covered.

Basal bark treatments are usually undertaken when the tree is in a dormant condition. According to Rudolf (1), "basal sprays appear to be most effective on some species if done early in the dormant season, and, on others, if done late in the dormant season".

In the experiments carried out at the Petawawa Forest Experiment Station, both Esteron 245 (2,4,5-T) and Esteron Brush Killer (2,4-D plus 2,4,5-T) were tested on various tree species. The concentration used was that recommended

[1] Formerly silviculturist at Petawawa F.E.S., now research forester, Alberta District Office, Calgary, Alberta.

by the manufacturers, that is, one pint of Esteron Brush Killer to three gallons of diesel oil.[2] Mature trees were selected and two treatments made, one in August, 1951, and the other in April, 1952. At least six trees of each species were sprayed in each treatment. Species and size classes included in the study were as follows:

| | Species | Diameter at B. H. (inches) |
|---|---|---|
| Softwoods | | |
| | white pine (*Pinus strobus* L.) | 11–15 |
| | balsam fir (*Abies balsamea* (L.) Mill.) | 7–10 |
| Hardwoods | | |
| | white birch (*Betula papyrifera* Marsh.) | 8–13 |
| | yellow birch (*Betula lutea* Michx.) | 10–14 |
| | trembling aspen (*Populus tremuloides* Michx.) | 11–15 |
| | sugar maple (*Acer saccharum* Marsh.) | 9–14 |
| | red maple (*Acer rubrum* L.) | 8–16 |
| | red oak (*Quercus borealis* Michx.) | 5–9 |

The method of application consisted of spraying the basal 18 inches of bark until the run-off stage, using a small garden sprayer.

## RESULTS

Susceptibility to the chemicals tested varied with species. No difference could be discerned between the action of the two chemicals. Both spring and late summer treatments gave similar results except for red oak. As shown in the accompanying table of results, the reaction of individual species appeared to be as follows:

| | |
|---|---|
| white pine | unaffected |
| balsam fir | 75% killed |
| white birch | largely unaffected |
| yellow birch | unaffected |
| aspen | killed |
| sugar maple | killed |
| red maple | killed |
| red oak | killed by April application, severely affected by August application |

From the foregoing, it is evident that either Esteron 245 or Esteron Brush Killer may be used to kill certain species in eastern Ontario but consideration must be given to the costs involved. The Esteron Brush Killer is the less expensive of the two, the purchase price being around $8 per gallon. It was found that about 8 trees, ranging in size from 8 to 16 inches, could be sprayed with one gallon of solution.

Diesel oil costs around 20c per gallon; thus the cost of treating the eight trees was approximately 50 cents for the chemical and 20 cents for the oil, or a total of 70 cents. This amounts to 9 cents per tree. At this rate, if 50 trees per acre required treatment, the cost of the solution would be $4.20. Naturally, these figures are subject to variation. One of the major factors governing the amount of solution used is the presence or absence of moss at the base of the tree; if this is abundant, the solution is absorbed readily and a considerable amount is necessary.

[2] Esteron 245 contained 76·8 oz. of Dichlorophenoxyacetic acid equivalent per Imperial gallon, and Esteron Brush Killer contained 38·4 oz. of 2-4 Dichlorophenoxyacetic acid equivalent and 38·4 oz. of 2,4,5 Trichlorophenoxyacetic acid equivalent per Imperial gallon.

Labour costs will vary with topography and accessibility and should therefore be determined on a local basis. Having assurance that the method will succeed on the species specified, and with an approximation of the cost of the solution, the interested forester should be in a position to judge if basal bark spraying would be economically feasible in certain stands.

TABLE I

BASAL BARK SPRAYS—RESULTS, SEPTEMBER, 1953

A—unharmed
B—slight damage
C—severe damage
D—complete mortality

| SPECIES | ESTERON 245 | | ESTERON BRUSH KILLER | |
|---|---|---|---|---|
| | Applied Aug. 1951 | Applied Apr. 1952 | Applied Aug. 1951 | Applied Apr. 1952 |
| white pine | A | A | A | A |
| balsam fir | D | A, C | D | D |
| | | | | |
| white birch | A | A, C | A | A, C |
| yellow birch | A | A | A | — |
| aspen | mature C saplings D | mature A, C saplings D | D | mature D saplings D |
| sugar maple | D | C, D | D | D |
| red maple | D | D | D | D |
| red oak | B, C, D | D | A, C, D | D |

## REFERENCE

(1) RUDOLF, P.O. 1951. Chemical control of brush and tree growth for the Lake States. United States Dept. of Agriculture. Misc. Report No. 15. Lakes States Forest Experiment Station.

EDMOND CLOUTIER, C.M.G., O.A., D.S.P.
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY
OTTAWA, 1956