

JACK-PINE BUDWORM CONTROL:

**I. A NEW SILVICIDE TREATMENT FOR THE REMOVAL
OF WOLF TREES IN PINE PLANTATIONS.**

by

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INTRODUCTION

Wolf trees¹ not removed during site preparation for the establishment of pine plantations pose unnecessary problems in stand establishment and subsequent management by:

- (1) Serving as major competition for young plantation trees.
- (2) Serving as sources of jack-pine budworm infestations.

Site preparation in Manitoba currently includes the destruction (usually by bulldozer) of all standing trees on land to be planted. However, many hundreds of acres of established plantations still have wolf trees which were not removed during earlier silvicultural practices. A consequence of wolf trees in plantations occurred in 1966 when budworm dropping from large jack pines onto a young red pine seed orchard near Hadashville, Manitoba, killed 20% of the trees (6 x 6' spacing, approximately eight acres). The following year a 4-man crew spent approximately six days carefully felling and disposing of the jack pines between the plantation rows.

The recent development of the Hypo-Hatchet[®] --silvicide injection method for the removal of undesirable trees offered a unique opportunity for appraisal of this equipment as an alternative to expensive cutting. Accordingly, a pilot study was initiated during 1968 to evaluate costs, time saving features and general performance of this silvicide treatment as compared with conventional cutting by chain saw.

The light-weight (3 lbs.) Hypo-Hatchet is connected by plastic hose to an inverted plastic container of Silvisar silvicide on a waist-belt. Each cut of the Hatchet delivers a fixed dose of the silvicide through an orifice in the blade. One cut per two inches DBH is recommended for conifers below eight inches in diameter.

This report, then, is intended as an appraisal of preliminary results of a new method of eliminating budworm-infested wolf trees; it is not intended as an endorsement of the products mentioned.

MATERIALS AND METHODS

Two typical jack pine plantations near Hadashville, Manitoba, were selected for the study (Table I). One-acre plots were established for each of two silvicide treatments (plantations A + B), and one 1/3-acre plot was used for a comparative chain saw treatment (plantation B).

¹ Dominant, large-crowned, randomly spaced and open-growing trees.

² Choristoneura pinus pinus Freeman; Lepidoptera, Tortricidae.

[®] Registered trade name of the Ansul Co., Marinette, Wisconsin.

TABLE I. DESCRIPTION OF TREATMENT AREAS

Jack pine Plantation	Field Age (yrs.)	Approximate No. Acres	Approximate No. Wolf Trees/Acre	Ave. DBH	Estimated Ht. Range
A	1	5	40	7"	20-60'
B	2	5	70	7"	30-50'

Silvicide treatments of Silvisar 510 Tree Killer were made on August 1, 1968, in plantation A and on August 26 in plantation B following the recommendations outlined in the descriptive literature in the Appendix. Trees removed by chain saw (Homelite XL-67) on August 27 and 28 followed conventional felling, limbing and piling practices. Records were kept on time expended, costs and performance of equipment used in each treatment. Efficacy ratings of the silvicide applications were made on October 15 by visual observations of crown mortality.

RESULTS

The results of the silvicide and cutting treatments are found in Table II; final determination of efficacy of the silvicide treatments will be made in 1969 after the commencement of the growing season. Comparative costs of the treatments, based on the current labor rate of \$1.85/hr., are presented in Table III.

DISCUSSION AND SUMMARY

Because the wolf trees were treated late in the growing season (August), final analysis of the silvicide treatments was not possible. For this reason, appraisal of the comparative results and costs was based on the assumption that 100% mortality of treated trees will occur during the following year. On this basis, the hatchet injection of Silvisar was approximately 25% of the cost of conventional tree removal by chain saw. Roughly six times as many wolf trees can be treated per unit of time as well. However, silvicide treated trees were not felled, sectioned and piled outside the plantation. The initial cost of the hatchet, necessary accessories and one gallon of the silvicide represents also a savings of nearly 40% of the retail price of a light-weight chain saw (10 lbs.).

The hatchet, weighing about 3 lbs., was less fatiguing to use than the light-weight saw; however, the hatchet caused rapid tiring when used with one hand. Following normal precautionary measures, the hatchet required no more care than for proper use of an axe or chain saw. The silvicide remained within the cuts on the trunks of treated trees; splashing or squirting of the liquid did not occur once in approximately 325 cuts on trees ranging from 4" to 10" in diameter.

TABLE II. RESULTS OF SILVICIDE AND CHAIN SAW TREATMENTS

Treatment	Acreage Treated	Time for Treatment (Man-hours)	No. Trees Treated	Projected No. Trees Treated in 1 hr.**	Efficacy of Treatment (Amount of Crown mortality approximately 7 weeks after treatment)			
					0	Top 1/3	Top 2/3	3/3
I. Silvicide (Plantation A)	1.0	0.25	37	148	0.0	32.4%	48.6%	19.0%
II. Silvicide (Plantation B)	1.0	0.50	72	144	5.9%	11.7%	39.7%	42.7%
III. Chain Saw (Plantation B)	0.3	1.00	26*	26	—	—	—	(100%)

* Trees felled, sectioned and brush-piled outside plantation.

** Assuming similar stocking and size of wolf trees.

TABLE III. ESTIMATED RELATIVE COST FACTORS/ACRE *

	25 Trees/acre	50 Trees/acre	75 Trees/acre	100 Trees/acre
Silvicide				
Chemical	0.30	0.60	0.90	1.13
Labor	<u>0.37</u>	<u>0.62</u>	<u>0.93</u>	<u>1.20</u>
Total	<u>\$0.67</u>	<u>\$1.22</u>	<u>\$1.83</u>	<u>\$2.33</u>
Chain Saw				
Gas & Oil	0.66	1.32	1.98	2.64
Labor	<u>2.00</u>	<u>3.80</u>	<u>5.75</u>	<u>7.50</u>
Total	<u>\$2.66</u>	<u>\$5.12</u>	<u>\$7.73</u>	<u>\$10.14</u>

* Based on preliminary data:

Hypo-Hatchet - \$96.75; Silvisar - \$16.90; 1 gal. Silvisar applied at 1 ml/cut, 3 cuts/6-7" (DBH) tree, will treat approximately 1,500 trees (approx. \$1.13/100 trees).

Chain saw and service kit - \$190.00; gasoline and oil for 100 trees - about \$2.60; all costs exclusive of depreciation on equipment.

Several faults were found with the model used:

(1) The handle length was too short to permit two-handed use. A modification of the handle to pulp-axe length (24-27") would permit a more even and less tiring swing. A longer handle would be beneficial also in reaching the trunk through large branches of the lower crown.

(2) Any axe-like tool is designed basically for cutting. Unfortunately, the Hypo-Hatchet is not designed to cut branches without delivering the silvicide. An in-line trigger mechanism to temporarily discontinue flow would allow safe cutting of branches for access to the trunk, making the Hatchet a more "complete" instrument.

(3) A cap screw holding the blade to the head was difficult to remove because of its location thereby making disassembly for cleaning awkward. The set screw holding the head to the handle loosened continuously during the experimental assessment causing the head to hang by the hose connection. This fault should be corrected for safety reasons.

Information on other uses (including a complete description of the injection system) may be obtained from the western Canadian distributor:

Niagara Brand Chemicals
1326 Atkinson Street
Regina, Saskatchewan
(Attn: Mr. Roger E. Laurin, Research Specialist)

APPENDIX A

THE ANSUL SILVISAR - HYPO-HATCHET SYSTEM

