

RECOMMENDATIONS FOR FORMULATIONS OF
MATACIL FOR SPRUCE BUDWORM CONTROL

QUEBEC, 1977

by

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Report on Recommendations for Formulations of Matacil for
Use in Operational Aerial Spray Control of Spruce Budworm
in Quebec, 1977.

Ref. File Reports 73 and 74, May 1977

According to the spraying plan as outlined in Telex of Feb. 17, 1977 to CCRI from the Director, Entomology and Pathology Service, Dept. of Lands and Forests, Ste. Foy, P.Q., Matacil was to be applied at two concentrations, viz., 1.25 oz AI/12 fl. oz. (US)/acre and 1.00 oz. AI/12 fl. oz/acre. In addition, there were two different lots of the commercial concentrate, (A) Matacil 1.68 containing 1.4 lbs/US gal and (B) Matacil 1.8D containing 1.5 lbs. AI/US gal. Since both commercial formulations were prepared as oil soluble concentrates (O.S.C.) there was no need to test for stability, but the request was for proportions of F.O. 2 and F.O. 4 which would give approximately the same viscosities as in the formulations used in 1976. Viscosity of the 1976 Quebec Matacil formulation was 15 centipoise at 25°C and 20 and 30 cp at 10° and 0°C respectively, (Chemagro Corp., private communication).

The objective in these test formulations, therefore, was a viscosity of ca 15 centipoise at 25°C.

Calculation of Required Percent Volume of Concentrates.

Considering first Matacil conc. A - 1.68 OSC - 1.4 lb/US gal.

1. 1.25 oz. AI/12 fl. oz (US)

$$\cong 35.44 \text{ g}/355.2 \text{ ml} \cong 9.98 \text{ g AI}/100 \text{ ml.}$$

$$1.4 \text{ lb/US gal} = 635 \text{ g}/3785 \text{ ml}$$

$$9.98 \text{ g Matacil contained in } \frac{9.98 \times 3785}{635} = 59.5 \text{ ml (vol. \%)}$$

11. Similarly, the 1.0 oz AI/12 fl. oz would require 47.6% (vol) of the concentrate 1.68 OSC.

Matacil Conc. B (1.8D) containing 1.5 lb/US gal.

III. 1.25 oz AI/12 fl. oz (US) = 9.98 g AI/100 ml.

Conc. 1.8 D contains 1.5 lb/US gal = 680 g/3785 ml.

9.98 g in $\frac{9.98}{680} \times 3785$ = 55.5 ml conc. = vol. %.

IV. Similarly, 1.0 oz AI/12 fl. oz. from Conc. 1.8 D

Volume percent would be 44.4.

Method

A series of mixes of F.0. 2 and F.0. 4 (sample from Ste. Foy) were made up by volume as follows:

<u>F.0. 2</u>	<u>F.0. 4</u>
100	0
90	10
80	20
70	30
65	35
50	50

The appropriate volume percent of each concentrate for the required dosage was made up into several mixes with the various proportions of F.0. 2 and 4. The viscosities were determined and plotted (Figs. 1 and 2). From these data the approximate proportions of F.0. 2 and 4 were chosen to give the required 15 centipoise mix.

Results

From Figs. 1 and 2 the following four formulations were derived and recommended:

Matacil 1.8D
1.25 oz/12 fl. oz.

	Vol. %	1.00 oz/12 fl. oz.
Matacil 1.8	55.5	
F.O. 2 } 70:30	31.1	Vol. %
F.O. 4 }	13.4	44.4
	<u>100.0</u>	27.8
		27.8
		<u>100.0</u>
Density (g/ml-25°C)	0.902	0.907
Viscosity (cp-25°C)	14.5	15.2

Telex d. 11 - 03 - 77

Matacil 1.68
1.25 oz/12 fl. oz.

	Vol. %	1.0 oz/12 fl. oz.
Matacil 1.68	59.5	
F.O. 2 } 65:35	26.3	Vol. %
F.O. 4 }	14.2	47.6
	<u>100.0</u>	26.2
		26.2
		<u>100.0</u>
Density	0.929	0.924
Viscosity	15.0	14.5

Telex d. 14 - 03 - 77

VISCOSITY (CENTIPOISE @ 25°C)

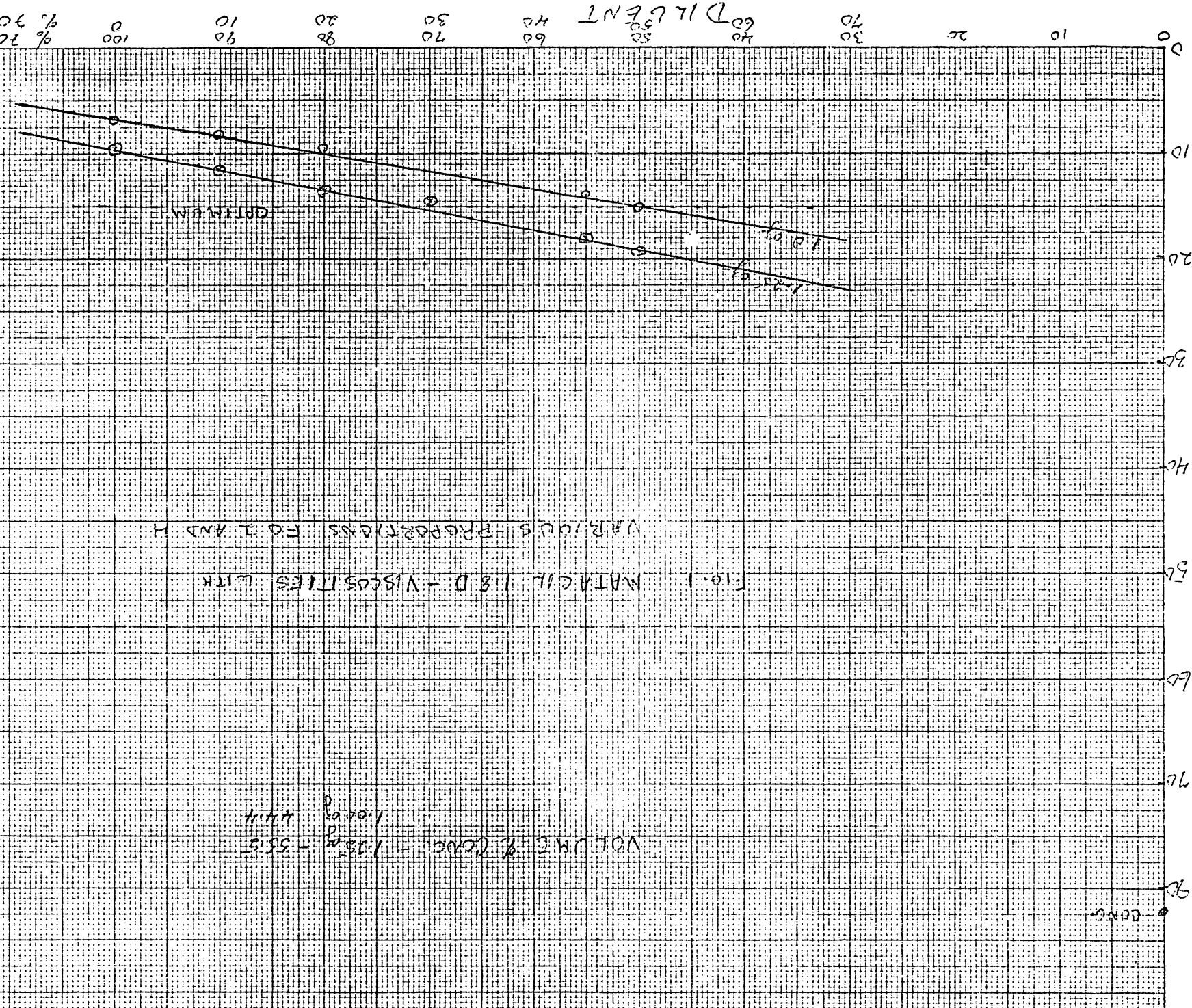


Fig. 1 NATURAL I.B.D. - VISCOSITIES WITH VARIOUS PROPORTIONS FO I AND H

VOLUME % CONG. = 1.35% - 55.5
 1.0% - 44.4

60 50 40 30 20 10 0
 70 80 90 100
 % 30.2
 % 30.4
 DILUTION

0 10 20 30 40 50 60 70 80 90 100
DILUENT
% 100 90 80 70 60 50 40 30 20 10 0
% 30 4

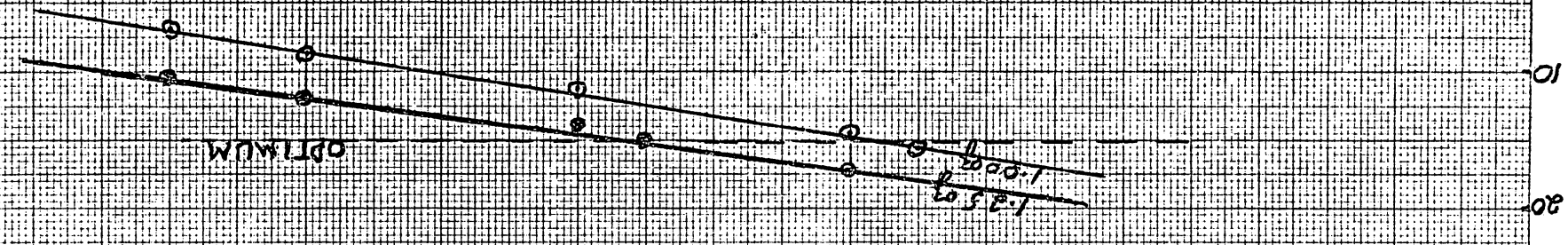


Fig. 2 MATACIL L8D - VISCOSITIES WITH VARIOUS PROPORTIONS FO 2 AND 4

VOLUME % CONC. - 1.25 oz - 59.5
- 1.00 oz - 47.6

VISCOSITY (CENTI POISE ~25°C)

% CONC.