SOME INFLUENCES OF PAINT MIXTURE IN TREE MARKING

By J. P. TREMBLAY¹

Jean-Paul Tremblay was born in Quebec City. After his studies at a normal school he worked four years as a teacher in an elementary school until he enlisted in the R.C.A.F. where he served for three years as air-crew.

Shortly after discharge he attended the Faculty of Forestry at Laval University where he graduated as a forestry engineer in 1951.

Jean-Paul Tremblay then joined Donnacona Paper Company Limited where he is looking after the selection cutting operations.

The selection cutting operations of this Company call for the marking of 20-25,000 cords or 500-625,000 trees each year. This can only be done between May 1st and October 31st.

Such an extensive program implies many problems, the first being the choice of the marking equipment. In this case, paint is used with a modified oil spray gun.

The cost per unit can vary according to the skill of the operators, the efficient use of the instruments and the paint mixtures.

In 1952, the main concern was to train suitable men in the proper appraisal of the trees.

Different brands of paint were tried. A marking paint prepared by Sico Paint Ltd. was appraised as to mixing, density, durability, opacity, color and price and was found very satisfactory. This paint was mixed with different solvents of which stove oil was found to meet the requirements adequately.

In 1953, the objective of the experiments was to try to reduce the cost per cord by marking more stems with a gallon of paint.

Four different mixtures (See Table I) were tried under similar conditions by the same personnel using the same tools:

1. *Period*—May 11th to November 15th, 1953
2. *Daily Temperature*—50° to 95° F. in the stands
3. *Labor*—Three operators worked on all the experiments
4. *Man-Day*—eight-hour day including travelling time and rest periods
5. *Silvicultural System*—free thinning in all stands
6. *Marking*—one thin line (about 3 feet long)
7. *Paint*—Sicomix, No. 29-550, flat Yellow at \$3.70 per gallon in five-gal. cans
8. *Solvent*—Esso Stove Oil at \$0.22 per gallon in 45-gal. drums
9. *Equipment*—three modified oil spray guns (the operators changed guns every day)

TABLE I
MIXTURES

Experiments	A	B	C	D
Paint percentage	45.5%	50%	55.5%	62.5%
Gallons of Mixture	135	35	19	67

¹ Donnacona Paper Company.

FINDINGS

Table 2 gives the results obtained with each of the four mixtures prepared. For the purposes of this report, only mixtures "A" and "D" will be dealt with.

Paint and Solvent

Seventeen per cent more paint is used with mixture "D": yet an operator can mark three times as many trees (135 vs 400) with a full reservoir. For a gallon of mixture "D", it is possible to mark 88 cords or an increase of 227% over "A".

Therefore, 60% less paint and 50% less solvent are required for the marking of the same number of stems.

Cost

A gallon of mixture "D" costs \$0.593 more than a gallon of mixture "A". Yet, due to the increase in production, the cost per cord marked is reduced by \$0.0328, which means for 25,000 cords, an approximate saving of \$820.00 in paint and solvent only.

There is also less possible waste because the gun reservoirs do not have to be filled so frequently.

Personnel

Less refilling is needed and operators spend more time marking trees: So the working hours are better utilized which is an economy of many man-days. Over the same period of time, five operators using mixture "D" would mark the same quantity as nine operators using mixture "A". This, for instance, would mean a reduction of around 325 man-days when marking 625,000 stems.

Furthermore, the work of the marking supervisor can be more efficient having less personnel to train and look after.

TABLE 2
SUMMARY OF THE RESULTS
MIXTURES

a) Number of Trees Marked per Filled Reservoir

	A	B	C	D
	135	200	300	400
b) Quantity Marked per Gallon				
Trees	740	1,100	1,650	2,200
Cords(1)	30	44	66	88
c) Quantity per Man-Day				
Mixture used (gals)	1.85	1.55	1.30	1.05
Trees marked	1350	1700	2100	2300
Cords Marked	54	68	84	92
d) Costs				
Gal of Mixture	1.802	1.960	2.153	2.395
Per Cord Marked	0.0600	0.0445	0.0326	0.0263
Per 100 Trees Marked	0.2435	0.1782	0.1305	0.1088

NOTE: (1) All cords are gross cords.

5.5 filled reservoirs per gallon

Table 3 is included here to emphasize what has been said above. Using a five-gallon can of paint as the basis for the mixture, it shows that 160% more cords can be marked with eight gallons of mixture "D" than with eleven gallons of mixture "A".

TABLE 3
MIXTURES VS QUANTITIES MARKED

Mixtures	A	B	C	D
Paint (gals)	5	5	5	5
Solvent (gals)	6	5	4	3
TOTAL	11	10	9	8
Trees Marked (average)	8100	11,000	14,800	17,900
Cords Marked (average)	315	440	600	725

CONCLUSIONS

The cost of the paint mixture may represent only a fraction of the total expenditures of marking the trees for selection cutting.

Yet this report tends to prove that by using an adequate mixture, substantial savings in money and human effort can be achieved.

It may be pointed out here that the productivity has increased from 54 to 92 cords per man-day, when using mixture "D".

Other savings in correlation with this operation have not been taken into account: accommodation of the personnel, transportation of men and equipment, wear and tear of the equipment, etc.