



Use of Felled Trap Trees as a Supplementary Technique for Reducing Spruce Beetle Infestation

Trap trees, as used here, refer to living uninfested Engelmann or white spruce trees felled, and otherwise untreated, at a specific time of year to attract beetles emerging from infested trees, logs, slash or stumps. Nagel et al. (1957) indicated the effectiveness of trap trees, in Colorado, in attracting beetles for distances of $\frac{1}{4}$ to $\frac{1}{2}$ mile. In 1955, at Cold Creek, in southeastern British Columbia, trap trees successfully attracted newly emerged beetles and considerably reduced further attacks on green standing trees. A small infestation in Engelmann spruce near Lillooet apparently was largely contained in 1977 by the judicious use of trap trees.

Further research on various aspects of, and on procedures in the use of trap trees is desirable before hard and fast rules can be provided. Nevertheless, since there is a demand for instructions on

the use of trap trees, the following steps and guidelines are suggested where infested material cannot be removed or treated before beetle flight and attack on standing spruce trees.

I. Preliminary survey

1. Determine the extent of the previous year's attack by aerial surveys in August or September, locating and mapping the area of spruce trees with discolored foliage. At the same time, determine the extent of the susceptible stand (i.e., of mature spruce trees).
2. Locate currently infested trees and/or wind-fall by ground surveys. Use probe lines to determine the spread beyond the area of discolored trees. Examine the bark of green

trees for evidence of attacks; i.e., of boring dust and pitch tubes.

3. In each infestation, check brood development in the fall, in 20-25 attacked green trees, by exposing the galleries on $\frac{1}{2}$ square foot of bark area, and determine the percentage in the various stages of development (i.e., adult, pupa, larva). An extended hot, dry summer may accelerate beetle development from a two-year-cycle to one, and if the number of pupae and young adults exceeds 50% of the brood, there is a possibility of an increased number of trees being attacked the next spring.

II. Deployment of trap trees

During winter or early spring, fell one green uninfested spruce tree of average size or larger for every 5-10 standing infested trees. Trees should be felled in the shade, uniformly throughout the infestation.

An alternative to the individual scattered tree method is to fell green spruce trees in patches of 1 to 5 acres every $\frac{1}{2}$ mile or so along access roads or in accessible areas, leaving other tree species to provide shade for the trap trees. This may be supplemented with scattered felled trees in areas of difficult access.

III. Desirable characteristics of trap trees

- a) Trap trees should be mature or at least large diameter trees, preferably with thick bark.
- b) They should lie on the ground, or as close to the ground as is feasible, in a direction and

location that will allow the greatest shade.

- c) Trap trees should not be delimbed or bucked into logs.
- d) Trees should be cut so that stumps are as low as is feasible.

IV. Treatment of trap trees

Remove trap trees from the woods before the next beetle flight (i.e., before May or June of the year following infestation), and process the logs to destroy the beetle broods.

Infested trap trees, which cannot be removed, should be peeled to expose the immature brood to the elements. It is not necessary to peel the entire bark since strips an axe-blade wide, separated by 3 or 4 inches around the log, would be sufficient.

Trees adjacent to trap trees and infested wind-throw should be examined and, if infested, removed or treated at the same time.

References

- Cottrell, C.B. 1978. Spruce beetle in British Columbia. P.F.R.C., Canadian Forestry Service, Victoria, B.C. F.P.L. 13 (revised 1978).
- Dyer, E.D.A., and D.W. Taylor. 1971. Spruce beetle brood production in logging slash and wind-thrown trees in British Columbia. Inf. Rep. BC-X-62.
- Nagel, R.H., David McComb, and R.B. Knight. 1957. Trap tree method for controlling the Engelmann spruce beetle in Colorado. *Journal of Forestry* 55(12): 894-898.

Trap trees may be used to augment other methods of reducing spruce beetle populations, such as removing scattered and stand edge wind-throw, green logs, right-of-way and other felled trees, and treatment of stumps after they have become infested and before beetle flight.