



Timber Talks



Prepared by V. H. Phelps, Forest Research Laboratory, 506 W. Burnside Road, Victoria, B.C.

BEHAVIOURAL CHANGES IN DOUGLAS-FIR BEETLES

No. 15

Insects with large reserves of fat have a greater inclination to disperse than those with little fat. Douglas-fir beetles whose fat content exceeds about 20% of their dry body weight show an inclination for flight but when the fat content is reduced the response is less evident. Sometimes beetles which disperse during early periods of their adult life lose their inclination for flight in later adulthood. An investigation was conducted to determine if this change in behaviour is related to a reduction in the insect's fat content due to utilization of fat as an energy source for flights in early adult life.

Over two hundred newly emerged female beetles were weighed, measured and assigned an index value. The index rating was expressed as the ratio between length of the insect in millimetres and its weight in milligrams. The beetles were separated into pairs of similar index values, one insect being subjected to exercise on a flight mill in the laboratory and the other retained unflown as a control. Flown and control insects were oven-dried, subjected to soxhlet extraction and their fat content expressed as a percentage of the lean dry weight after extraction.

Beetles whose mean flight time was 210 minutes had an average 1.88 milligrams of fat, which was equivalent to 37% of their lean dry body weight; control insects had 2.28 milligrams of fat or 45% of lean dry body weight.

The change in the behavioural pattern of the beetles is related to a reduction of their fat content during flight exercise. However, it may not be solely the result of fat combustion. An accumulation of metabolic by-products or perhaps the combustion of certain types of fat could induce behavioural change. Further investigation is required to clarify these matters.