SEED EXTRACTION METHODS AND QUALITY EFFECTS IN *PINUS RADIATA* D. DON

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DZINGAI RUKUNI

1997

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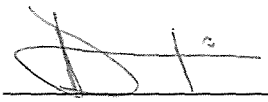
Signed: 

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ABSTRACT

The current study aims to investigate the effectiveness of various heated air and microwave oven treatments on seed extraction efficiency and subsequent seed quality in *Pinus radiata*. Radiata pine cones were collected from Foxton from a commercial plantation and used in preliminary studies considering a range of both heated air and microwave oven treatments. Cones of different genetic families were collected from an open pollinated seed orchard owned by Carter Holt Harvey Forests at Matakana Island.

In the air oven extraction method temperature and duration combinations of 50°C and 24 hours or 60°C and 12 hours were found to be most suitable for seed extraction while giving good seed quality in preliminary experiments. A temperature of 40°C was found to be too low for efficient seed extraction while 70°C was found to be lethal to seeds. Various temperature and duration combinations gave similar results since a decrease in extraction temperature could, in some cases, be compensated by an increase in the extraction period.

Exposure of cones in a microwave oven affected germination, particularly when only 1 or 2 cones were heated at each exposure time. However when 3-5 cone samples were used heating for 30 or 40 seconds was sufficient to break scale resin bonding. Ambient storage of treated cones for up to 7 days following microwave oven treatment allowed full scale reflexing and high seed extraction efficiency.

Cones from 10 different families showed variable germination responses to different seed extraction conditions. Two families showed consistently high germination across all treatments while the rest showed reduced germination. Whether this reflects genetic differences in cone serotiny, seed thermosensitivity differences, cone wood density, resin bond strength, or is related to seed size and/or moisture content is not known. Seedling dry weight was not affected by extraction temperature and/or duration of heating, being found to be more a function of seed size.

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