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PROJECT RECORD COVER SHEET

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Division FOREST HEALTH + IMPROVEMENT Project Record No. 2048

Research Field FH1 PEG Project No. 3 Sub-project No. _____

RF Id _____ Work Plan No. _____ Expt No. _____

Author M. DIBLEY, T. FAULDS, M. MENZIES Date 1 / 10 / 88

Title BUD AND FOLIAGE CHARACTERISTICS OF CUTTINGS FROM
1- TO 5-YEAR-OLD TREES

Distribution

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FOREST RESEARCH INSTITUTE

PROJECT RECORD NO.: 2048

DIVISION: Forest Health and Improvement

RESEARCH FIELD: Propagation and Early Growth

PROJECT NO.: 3

SUBPROJECT NO.:

R.F. ID.:

WORK PLAN NO.:

FIELD EXPERIMENT(S):

TITLE: Bud and Foliage Characteristics of Cuttings from 1- to 5-year-old trees.

AUTHOR(S): M.G. Dibley, T. Faulds, M.I. Menzies

DATE: October 1988

KEYWORDS: Pinus radiata, cuttings, physiological age

ABSTRACT*

The bud and foliage characteristics of cuttings from 1- to 5-year-old trees are described, including photographs of typical cuttings. These cuttings would have a physiological age equal to their chronological age if collected from a central North Island site. Cuttings collected from milder sites would have a more advanced physiological age compared with their chronological age.

Note: This material is unpublished and must not be cited as a literature reference

PINUS RADIATA

This report describes the characteristics of different stages of maturation of cuttings of shoots from one- to five-year-old trees.

Cutting material from one-year-old seedlings does not have sealed buds or lateral branches. The foliage is mostly large primary needles with the secondary needles or true fascicles usually shorter than the primary needles. The foliage is more supple, without damaging tissue, than older material (Figure 1).

Cuttings from five-year-old trees have a whorl of sealed buds on every cutting. The secondary needles are all at least ten centimetres long when they are fully grown and the primary needle is reduced to about 1 cm long and is often dessicated to a small brown spike if it is there at all. The foliage is less supple than younger material and could very well snap if bent too far (Figure 5).

Cuttings from two- to four-year-old trees display characteristics somewhere between those of the cuttings from one- and five-year-old trees. There are usually no sealed buds in material from two-year-old trees, although the apical portion of the stem and foliage is usually yellower than foliage from one-year-old seedlings, and the apical foliage may be shorter than foliage from one-year-old seedlings.

The foliage of cuttings from three-, four- and five-year-old trees is all very similar. The distinctive characters of each age group are the ratio of sealed buds in groups of cuttings, the increasing length of the foliage and the darker green in the more mature cuttings.

The differences between the different age groups for varying characteristics are shown in Table 1. These differences indicate the maturation of radiata pine foliage in relation to its age, and are based upon samples from the central North Island. It is important to note that radiata pine matures more quickly in areas that have a milder climate than the central North Island. This means that the physiological age of cutting material will be older than the chronological age of the trees on a milder site. For example, cuttings from 4-year-old trees on a coastal Bay of Plenty site had an apparent physiological age of 6 years, based on their needle and bud characteristics, and the presence of pollen catkins.

TABLE 1 - Shoot characteristics of cuttings from 1- to 5-year-old radiata pine trees

Physio- logical age (yrs)	Cuttings with sealed buds %	Length of primary needle (cm)	Length of fascicle needles (cm)	Presence of lateral shoots %
1	0	2.5 - 3.0	2.5 - 3.0	0
2	0-5	1.5 - 3.0	2.5 - 6.0	10 - 15
3	20-25	1.0 - 2.0	5 - 8	85 - 90
4	75-80	1.0 - 1.5*	8-12	100
5	90-100	0.5 - 1.0*	10-16	100

* The primary needles of cuttings from four- and five-year-old trees are often dessicated and completely gone.

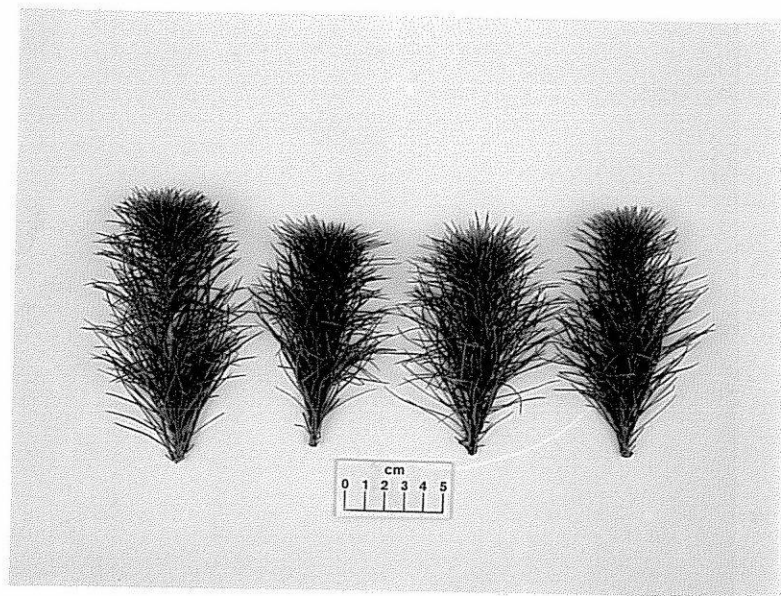


Figure 1: Cuttings from one-year-old seedlings

Figure 2: Cuttings from two-year-old trees

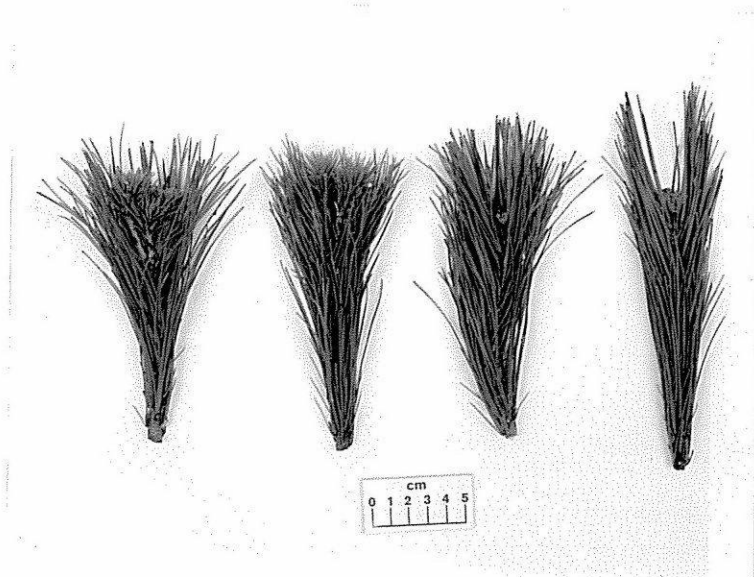
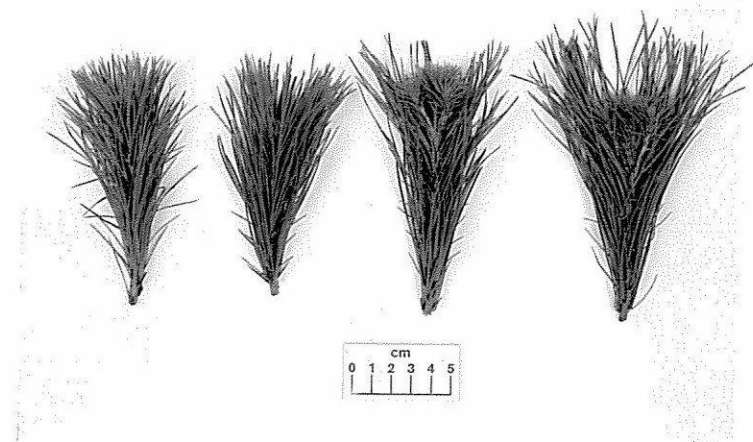


Figure 3: Cuttings from three-year-old trees

Figure 4: Cuttings from four-year-old trees

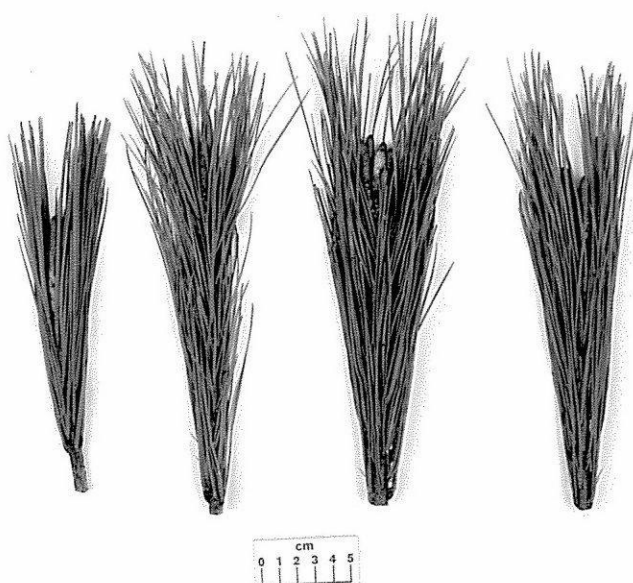
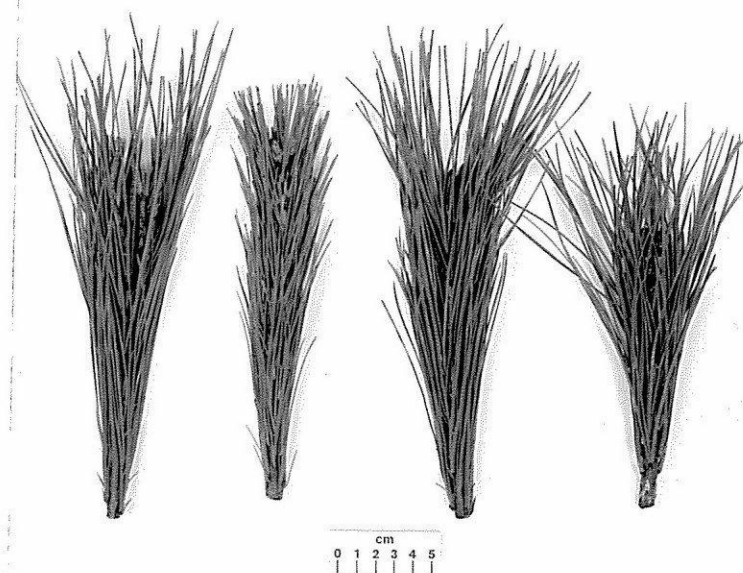


Figure 5: Cuttings from five-year-old trees