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**FOREST NURSERY**  
**Demonstrate knowledge of tree stock  
conditioning and topping principles**

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<b>level:</b>	<b>4</b>
<b>credit:</b>	<b>4</b>
<b>planned review date:</b>	June 2008
<b>sub-field:</b>	Horticulture
<b>purpose:</b>	People credited with this unit standard are able to demonstrate knowledge of the prerequisites for effective tree stock conditioning, tree stock conditioning principles, and tree stock topping principles.
<b>entry information:</b>	Open.
<b>accreditation option:</b>	Evaluation of documentation and visit by NZQA, industry and teaching professional in the same field from another provider.
<b>moderation option:</b>	A centrally established and directed national moderation system has been set up by the Primary Industry Training Organisation.
<b>special notes:</b>	<ol style="list-style-type: none"><li>1 This unit standard covers the principles involved in the conditioning and topping of radiata pine and eucalypt seedlings and of radiata pine cuttings. These principles are equally applicable to seedlings, transplants, and cuttings of other forest tree species.</li><li>2 Reference Competence in this unit standard requires knowledge of van Dorsser, J.C. 1981: Seedling conditioning. Pp 128-140 in Chavasse, C.G.R. (Ed.) 'Forest Nursery and Establishment Practice in New Zealand', <i>Forest Research Institute Symposium No.22</i>.</li></ol>

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**Elements and Performance Criteria**

**element 1**

Demonstrate knowledge of the prerequisites for effective tree stock conditioning.

**performance criteria**

- 1.1 Seed sowing times are outlined in relation to their influence on minimum undercutting height and timing of undercutting.
- Range: radiata pine, one eucalypt species.
- 1.2 Seed spacings are outlined in relation to their influence on root volume, foliage illumination, and conditioning effectiveness.
- Range: radiata pine, one eucalypt species.
- 1.3 Spacings of cuttings are outlined in relation to their influence on stem diameter, shoot development, and root system quality.

**element 2**

Demonstrate knowledge of tree stock conditioning principles.

Range: radiata pine.

**performance criteria**

- 2.1 Seasonal growth patterns of unconditioned seedlings are outlined in relation to the effect of spacing on seedling morphology.
- 2.2 Growth patterns of seedlings subject to mechanical conditioning are outlined in relation to the effect of such conditioning on seedling sturdiness.
- 2.3 Conditioning treatments of seedlings and their timing are outlined in relation to their effects on seedling morphology and physiology.
- Range: undercutting, wrenching, wrenching frequency, lateral root pruning, carbohydrate transfer, height, diameter, fibrous roots, root growth capacity.

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- 2.4 Conditioning treatments of cuttings and their timing are outlined in relation to their effects on root system quality.

**element 3**

Demonstrate knowledge of tree stock topping principles.

**performance criteria**

- 3.1 The desirability of topping either before or after undercutting is outlined in relation to its effect on fibrous root development.
- Range: leaf area, carbohydrate transfer, radiata pine, one eucalypt species.
- 3.2 The practice of re-topping is outlined in relation to its effect on bud and shoot development.
- Range: radiata pine – fascicle buds, small shoots, hardening off;  
eucalypts – accessory buds, foliage re-development.
- 3.3 Topping severity is described in terms of its effect on seedling malformation.

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**Comments on this unit standard**

Please contact Primary Industry Training Organisation <http://www.primaryito.ac.nz> if you wish to suggest changes to the content of this unit standard.

**Please Note**

Providers must be accredited by the Qualifications Authority or a delegated inter-institutional body before they can register credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

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Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for providers wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

This unit standard is covered by AMAP 0032 which can be accessed at <http://www.nzqa.govt.nz/site/framework/search.html>.