Title	**Describe the characteristics and management of forest insects**		
Level	**5**	**Credits**	**8**

Purpose	People credited with this unit standard are able to: outline the principles of entomology; describe the characteristics and management of insects which defoliate trees; describe the characteristics of insects that feed on wood; describe the characteristics of sapsucking and gall-making insects; describe the inoculation and transmission of fungal diseases between host trees; describe the characteristics of bark beetles; describe the characteristics of insects in New Zealand indigenous forests; describe the characteristics of insects found in nurseries and newly established forests; describe the characteristics of overseas insects not yet found in New Zealand; explain the concept of biological control, and the advantage that this system has for the control of forestry insects and weeds; and prepare insect collections for identification.

Classification	Forestry > Forest Health Surveillance

Available grade	Achieved

Guidance Information

References
Exotic Pests and Diseases of Pine not wanted in New Zealand (2003). FRI Bulletin 227, available at http://www.scionresearch.com/.
Field Guide to Common Pests, Diseases, and other Disorders of Radiata Pine in New Zealand (referred to as the Field Guide in this standard). FRI Bulletin 207, available at http://www.scionresearch.com/.
Forest and Timber Insects in New Zealand (a series of pamphlets), available at http://www.scionresearch.com.
New Zealand Institute of Forestry. *Forestry Handbook* (referred to as the Handbook in this standard), available at http://www.nzif.org.nz/.

Outcomes and performance criteria

Outcome 1

Outline the principles of entomology.

Performance criteria

1.1 The classification of insects and the nomenclature of entomology are described.

1.2 Insects are described in terms of external features, internal structures, growth cycles and life cycles.

1.3 Insect orders of forestry interest are described, including the role of insects in the forest.

1.4 The population dynamics of insect outbreaks are described.

Range description includes – the role of population dynamics in pest management, conditions affecting populations, population monitoring, tree damage monitoring.

Outcome 2

Describe the characteristics and management of insects which defoliate trees.

Performance criteria

2.1 The common insect defoliators of pines in New Zealand are described in terms of their general characteristics, and their effect upon the tree is explained in accordance with the Field Guide.

2.2 The common insect defoliators of eucalypts in New Zealand are described in terms of their general characteristics and their effect on the tree is explained in accordance with the Field Guide.

2.3 Management strategies to control insect defoliators are described in accordance with the Handbook.

Range species selection, chemical control, biological control.

Outcome 3

Describe the characteristics of insects that feed on wood.

Performance criteria

3.1 Insects found in New Zealand which feed on processed timber are identified and described in terms of their distribution and general characteristics in accordance with the reference texts.

3.2 Three stem and wood boring insects in trees and forests are identified and their biology, hosts, and damage are described in accordance with the reference texts.

3.3 Three types of termites found in New Zealand are described in accordance with the reference texts.

Range termites types include – drywood, wetwood and subterranean; description must include – biological difference, damage caused, methods of control.

Outcome 4

Describe the characteristics of sapsucking and gall-making insects.

Performance criteria

4.1 The general biology and morphology of sapsucking and gall-making insects are described in accordance with the reference texts.

4.2 The hosts, damage, and control of sapsucking and gall-making insects are described in accordance with the reference texts.

Outcome 5

Describe the inoculation and transmission of fungal diseases between host trees.

Performance criteria

5.1 The response of host trees to fungal diseases carried by the insect vector is described.

Range *Sirex* and *Amylostereum areolotum* in pines, *Scolytus* and *Ophiostoma novo-ulmi* in elms, *Platypus* and *Sporothrix* in beech.

5.2 Climatic factors which predispose towards the inoculation and transmission of fungal diseases are described.

5.3 Host susceptibility and control methods are described.

Outcome 6

Describe the characteristics of bark beetles.

Performance criteria

6.1 The commonly found bark beetles in New Zealand are identified and described in terms of their biology, distribution and host species.

6.2 The damage caused by bark beetles, and the characteristic differences in the host engraving patterns are described.

Outcome 7

Describe the characteristics of insects in New Zealand indigenous forests.

Performance criteria

7.1 The basic dynamics of insect populations in New Zealand indigenous forests are described in accordance with the reference texts.

Range *Neomycta pulicaris, Platypus*.

7.2 The insect populations in undisturbed indigenous forests are compared with the insect populations in indigenous forests that have been modified by human activity.

Outcome 8

Describe the characteristics of insects found in nurseries and newly established forests.

Performance criteria

8.1 Insects commonly found in nurseries and young stands of trees are identified and described in terms of their distribution and general characteristics in accordance with the reference texts.

Range *Odontria, Costylytra, Inopus, Hylastes, Helicoverpa*.

8.2 The characteristic damage caused by insects in nurseries and young stands of trees is described in accordance with the reference texts.

8.3 Methods to mitigate or control damage are described in accordance with the reference texts.

Outcome 9

Describe the characteristics of overseas insects not yet found in New Zealand.

Performance criteria

9.1 The types of insect which could become pests in New Zealand, and their possible means of entry are described in accordance with the reference texts.

Range *Lymantria dispar* (gypsy moth), *Rhyaconia buoliana* (European pine shoot moth), *Dendroctonus, Ips*, *Hylobius*.

9.2 The possibility that insects, innocuous in their native environment, could become pests in New Zealand is discussed in terms of the reference texts.

Range dynamics of natural insect populations, the role of natural predators, availability of food sources.

Outcome 10

Explain the concept of biological control, and the advantage that this system has for the control of forestry insects and weeds.

Performance criteria

10.1 The concept of biological control is explained in accordance with the reference texts and the Handbook.

10.2 The advantages of control of insect pests by biological means are described using New Zealand case studies.

Range *Sirex* and parasites (*Rhyssa, Megarhyssa, Ibalia, Deladenus), Paropsis* control with *Enoggera, Phylacteophaga* control with Bracon, *Gonipterus* with *Anaphes*, *Eriococcus* with various agents.

10.3 The advantages of controlling weeds with insects are described using New Zealand case studies.

Range description includes – introduction of *Cleoptus* to control buddleja, the control of gorse, blackberry and broom.

Outcome 11

Prepare insect collections for identification.

Performance criteria

11.1 Specimens of insects are prepared for dispatch according to the requirements for the type of insect in accordance with the reference texts.

11.2 Collection forms and health inspection forms are completed for inclusion with the collection in accordance with the reference texts.

Planned review date	31 December 2028

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 December 1996	31 December 2015
Revision	2	5 January 1999	31 December 2015
Review	3	29 August 2001	31 December 2015
Review	4	17 September 2010	31 December 2015
Review	5	10 December 2015	N/A
Rollover and Revision	6	28 May 2020	N/A
Rollover	7	26 April 2024	N/A

Consent and Moderation Requirements (CMR) reference	0173

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Muka Tangata - People, Food and Fibre Workforce Development Council qualifications@mukatangata.nz if you wish to suggest changes to the content of this unit standard.