Model Answers

Domain	Forestry > Forest Foundation Skills				
Unit	22998	v4	Demonstrate knowledge of pruning planation trees and prune planation trees under supervision	Level 2	Credits 10

Entry information

There are no pre-requisite requirements for this unit.

Assessment instructions

You will need to be able to show you can:

- Demonstrate knowledge of pruning plantation trees.
- Demonstrate knowledge of equipment used for pruning plantation trees.
- Demonstrate knowledge of pruning faults.
- Prune plantation trees under supervision.

Important information

- Carefully read through the rest of this Assessment so you know exactly what is expected.
- All evidence you provide for this assessment must be your own work.
- Clearly name and label all attached evidence.

What you need to do

Question Set 1 – Pruning

Question Set 2 – Equipment

Question Set 3 – Hazards

Observation Checklist
Be observed pruning plantation trees.

You will need to:

- Identify specific tree characteristics.
- Identify faults in a pruned stand.
- Select and use PPE and pruning equipment.
- Identify hazards.
- Determine pruning height.
- Open up the trees and carry out low and medium-height pruning operations.
- Tally and report pruned trees.

Worksite Verification
A worksite verifier must confirm your skills, knowledge and/or work.

You can also attach additional evidence which shows you have the required skills and knowledge, e.g. photos, worksite documents, checklists, work samples, videos.

Unit standard information

Conditions

- This unit standard must be assessed against on-job.
- All activities and evidence must meet the worksite procedures and accepted industry practice.

Definitions

- *Accepted industry practice* – approved codes of practice and standardised procedures accepted by the wider forestry industry as examples of best practice.
- *Forest harvesting* - refers to the felling and extraction of stems, landing operations, log making, and loading.
- *Forestry Operations* - include land preparation, planting, releasing, pruning and thinning to waste.
- *Job prescription* - refers to any written instructions for the operation and may include maps, harvest plans or cut plans.
- *Worksite procedures* - refer to documented procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, site safety procedures, equipment operating procedures, quality assurance procedures, housekeeping standards, procedures to comply with legislative and local body requirements.

References

- New Zealand Forest Owners Association, *Forest Practice Guides* (2019), and any subsequent amendments, available from http://www.nzfoa.org.nz. (**Note** – these guides support the NES-PF and have replaced the *New Zealand Environmental Code of Practice* for Plantation Forestry referenced in the unit, which is now out-of-date).
- *Approved Code of Practice (ACOP) for Safety and Health in Forestry Operations*, December 2012, available from http://www.worksafe.govt.nz.

Legislation

The following legislation (law) applies to this unit standard:

- Health and Safety at Work (HSW) Act 2015.
- Resource Management Act 1991.
- Resource Management (National Environmental Standards for Plantation Forestry) Amendment Regulations 2018.
- Heritage New Zealand Pouhere Taonga Act 2014, and any subsequent amendments.

Unit standard evidence map

Unit 22998 v4	Demonstrate knowledge of pruning planation trees and prune planation trees under supervision	Level 2	Credits 10
Outcomes and Performance Criteria		**Evidence**	**No.**
Outcome 1:	Demonstrate knowledge of pruning plantation trees.		
1.1	Basic pruning terminology is defined. Range: branch collar, branch stub, defect core, diameter over stubs (DOS), coat hanger, clear wood, regime, lift, variable lift, ramicorn, form pruning, crown depth, gauge, tree form, spacing, bark damage.	Question Set 1	1, 3
1.2	The purpose of pruning is explained in terms of the effect on the final crop.	Question Set 1	2
1.3	Characteristics of tree physiology are described. Range: internodal length, whorl, crown shape and density, dominance, branch size and angle, multi-leader, ramicorn, epicormic.	Question Set 1	3
1.4	The lifts of pruning are described. Range: fixed height, variable height, ultra-high pruning.	Question Set 1	4
1.5	Factors affecting the timing of pruning are described.	Question Set 1	5
1.6	The interrelationships between pruning and other operations are described. Range: impact of first lift pruning on other pruning lifts, impact of pruning on thinning operations.	Question Set 1	6a,b
1.7	The consequences of incorrect pruning are described in terms of the quality and value of the final crop. Range: heights, collar damage, coat hangers, epicormics.	Question Set 1	7,8,9
Outcome 2:	Demonstrate knowledge of equipment used for pruning plantation trees.		
2.1	Equipment used for pruning is named and its function explained.	Question Set 2	1
2.2	Factors affecting the choice of equipment for pruning are described.	Question Set 2	2

	Range: pruning lift, stand factors.		
Outcome 3: Demonstrate knowledge of pruning faults.			
		Worksite verification	1, 2, 3, 4
3.1	Pruning faults in a pruned stand are identified.	Observation Checklist	Part B: 4, 8, 16
3.2	Ways to prevent and rectify the identified pruning faults are explained.	Observation Checklist	Part B: 4, 8, 16
Outcome 4: Prune plantation trees under supervision.			
		Worksite verification	1, 2, 3, 4
4.1	Personal protective equipment and pruning equipment is selected and used. Range: pruning equipment may include but is not limited to – loppers, epicormic tool, jack saw, callipers and/or gauge, chains, steps, ladder, water supply, spare parts, height pole; personal protective equipment may include but is not limited to – gloves, leggings, wet weather gear, high visibility gear, safety boots, hard hat, harness.	Observation Checklist	Part B: 1, 2, 8, 16
4.2	Pruning height is determined in accordance with the job prescription. Range: may include but is not limited to – crown is visually measured, calliper is used to determine pruned height, reach of equipment is estimated.	Observation Checklist	Part B: 5, 8, 16
4.3	The tree is opened up. Range: low prune – remove branches that block access, prune from bottom up, circle the tree once; medium prune – check for overhead hazards, correct ladder placement.	Observation Checklist	Part B: 6, 7, 8, 16
4.4	Tree is pruned using ergonomic techniques. Range: may include – correct body position, correct ladder position and angle.	Observation Checklist	Part B: 9, 15, 16
4.5	Branch is cut flush with the stem in accordance with the job prescription.	Observation Checklist	Part B: 10, 15, 16

4.6	Epicormics are removed.	Observation Checklist	Part B: 11, 15, 16
4.7	Large branches are removed in accordance with the job prescription and worksite procedures. Range: double cut, scarf cut, no tearing, no draw wood.	Observation Checklist	Part B: 12, 15, 16
4.8	Pruned trees are correctly tallied, and are reported to the supervisor.	Observation Checklist	Part B: 13, 14, 15 ,16
4.9	Pruning hazards are identified, and a method of control for each hazard is explained. Range: hazards may include but are not limited to – cuts, trips, falls, hit by branch, hyperthermia, hypothermia, dehydration, stand or block hazards, working at heights, use of tools, slash, other workers, surrounding vegetation, terrain, ground conditions, weather conditions; evidence relating to six hazards is required.	Question Set 3 Observation Checklist	1 Part B: 3, 8, 16
4.10	The need for on-going hazard identification and assessment is explained.	Question Set 3	2
4.11	Factors that affect hazard assessment and may introduce new hazards to the operation are explained. Range: may include – weather, terrain, hindrance.	Question Set 3	3

Question Set 1 – Pruning

These questions are about pruning plantation trees.

Use your own words. Your assessor may ask you more questions to check your understanding.

1. Define the following pruning terms. ☑

Assessor

This question supports PC 1.1.

Judgement statement

☐ The correctly defines each pruning term listed.

Example answers

Term	Definition
Bark damage	Damage to the bark of a tree as a result of an operation.
Branch stub	The piece of branch left after branch has been pruned.
Clear wood	High value knot free timber.
Coat hanger	A branch stub of unacceptable length left after pruning.
Crown depth	The amount of crown (green foliage) that remains after pruning.
Diameter over stubs (DOS)	Measurement taken over the largest pruned whorl to determine the defect core size when the tree matures.
Form pruning	The removal of ramicorns, large branches and double leaders at an early stage to improve tree form.
Gauge	A tool used to measure branch and stem diameters.
Lift	Each stage of pruning is called a lift.
Regime	The selected treatment of a stand (planting rate, pruning, thinning).
Spacing	The space between planted trees. Usually measured as distance along and between rows.

Variable lift	Pruned height varies based on the height of the tree.

2. What is the main purpose of pruning and how does pruning affect the final crop? ☑

Assessor

This question supports PC 1.2.

Judgement statement

☐ The candidate correctly explains the purpose of pruning in terms of its effect on the final crop.

Example answer

To remove branches resulting in a tree with pruned wood (clearwood), which increases the value of the final crop.

3. Describe each tree characteristic. ☑

Assessor

This question supports PC 1.1 and 1.3.

Judgement statement

☐ The correctly describes each tree characteristic.

Example answers

Characteristic	Description
Branch collar	• A bark swelling where the branch leaves the stem. Not to be damaged during pruning.
Branch size and angle	• The thickness of the branch and the angle it is growing.
Crown shape and density	• The shape and thickness of the upper foliage of a tree.
Defect core	• Central core of a mature tree that retains the knots formed before pruning took place.
Dominance	• Expressed as tree height, crown depth, tree size and a healthy condition.
Epicormic	• Small branch-like shoots that form on the stem of a tree.

Internodal length	• A knot free measured section of the log.
Multi-leader	• Tree that has more than one main stem, may be from ground level or occur up the stem.
Ramicorn	• A steep angled branch that competes with the main leader.
Tree form	• The straightness, leader condition and branching habit of a tree.
Whorl	• A number of branches around the stem of a tree at the same level.

4. Briefly describe each pruning lift. ☑

Assessor

This question supports PC 1.4.

Judgement statement

☐ The candidate correctly describes each pruning lift.

Example answers

Pruning lift	Description
Fixed height	• Trees are pruned to a fixed height unless a set green crown height is reached first. • Used if there is a uniform growth within a stand.
Variable height	• Height of prune is based on each tree. Prune to maximum height, or set stem diameter, or a set depth remaining crown.
Ultra-high pruning	• Pruning above the "normal" high pruning height of 6.0 to 6.5 metres.

5. Describe **two** factors that affect the timing of pruning. ☑

Assessor

This question supports PC 1.5.

Judgement statement

☐ The candidate correctly describes **two** factors that affect the timing of pruning.

Example answers

1. Pruning at the right time will achieve the target DOS.
2. Trees are tall enough to allow target pruned height to be achieved.

6. Answer questions 6a – 6b about the impact of pruning on other operations. ☑

Assessor

This question supports PC 1.6.

Judgement statement

☐ The candidate correctly describes the interrelationships between pruning and other operations, including impact of first lift pruning on other pruning lifts, and impact of pruning on thinning operations.

Example answers

a. How does first lift pruning affect other pruning lifts?

- Correct selection at each pruning operation will make the next lift easier as they will not have to reselect the crop trees.
- Pruning to correct height will mean the next lift will not have extra branches to remove, or have branches that are larger than expected.

b. How does pruning affect thinning operations?

Correct selection at pruning will mean the thinning operation will not have to reselect the crop trees.

7. Describe the type of final crop desired for each pruning regime (objective). ☑

Assessor

This question supports PC 1.7.

Judgement statement

☐ The candidate correctly describes quality requirements for pruning in relation to fixed and variable heights.

Example answers

Pruning regime	Type of final crop desired
Fixed height	All trees pruned to the same height. Average pruned log length target will be met.
Variable height	Trees will be pruned to different heights. Maximum pruned log volume from a stand with large variation in tree height.

8. How can pruning faults affect final crop value? ☑

Assessor

This question supports PC 1.7.

Judgement statement

☐ The candidate correctly describes the consequences of incorrect pruning in terms of final crop value.

Example answer

All pruning faults may lead to a decreased value of the final crop.

9. Describe how each incorrect pruning result can affect the quality of the final crop. ☑

Assessor

This question supports PC 1.7.

Judgement statement

☐ The candidate correctly describes the consequences of incorrect pruning in terms of final crop quality.

Example answers

Incorrect pruning result	Effect on final crop quality
Collar damage	May cause tree disease and slow the occlusion (healing) process.
Coat hangers	Will increase the DOS and slow the occlusion (healing) process.
Epicormic	May grow into a branch and therefore means the log is not pruned. Causes defects in clearwood.

Assessor – record key points from candidate's verbal answers as accurately and fully as possible.		
These answers were written by:	☐ Candidate	☐ Assessor

Question Set 2 – Equipment

These questions are about equipment used for pruning plantation trees.

Use your own words. Your assessor may ask you more questions to check your understanding.

1. Name **five** items of equipment used for pruning. For each explain what it is used for. ☑

Assessor

This question supports PC 2.1.

Judgement statements

- ☐ The candidate correctly names **five** items of equipment used for pruning.
- ☐ The candidate correctly explains what each item of equipment named is used for.

Example answers

Equipment	Use
Pruners / loppers	Used to remove branches.
Jacksaw	Used to remove branches – usually branches that are too big for the loppers.
Epicormic remover	Used to remove epicormics.
Gauge	Used to measure stem diameter.
Pouch	Used to hold tools – jack saw, epicormic knife, gauge.
Ladder	Used to prune trees to a height above what can be reached standing on the ground.
Step	Used to help operators achieve the required pruned height when their normal reach or the ladder length is not sufficient.
Chainsaw	Used to prune trees where branch size makes manual pruning difficult.

2. Briefly describe how each factor can affect your choice of equipment. ☑

Assessor

This question supports PC 2.2.

Judgement statement

☐ The candidate correctly describes how each factor can affect the choice of equipment for pruning.

Example answers

Factor	Effect on equipment choice
Pruning lift	The height of the lift will determine whether a ladder or step is required and the length of ladder to be used.
Stand factors	Branch size will determine if manual or chainsaw pruning is appropriate.

Assessor – record key points from candidate's verbal answers as accurately and fully as possible.		
These answers were written by:	☐ Candidate	☐ Assessor

Question Set 3 – Hazards

These questions are about pruning hazards and controlling associated risks.

Use your own words. Your assessor may ask you more questions to check your understanding.

1. Give **one** example for each type of hazard. ☑

   For each example, explain the risk and how you would control it.

Assessor

This question supports PC 4.9.

Judgement statements

- ☐ The candidate correctly provides **one** example for each type of hazard.
- ☐ The candidate correctly explains the risk for each example provided and how they would control each risk when plotting.
- ☐ Answers are in accordance with worksite procedures.

Example answers

Overhead hazard
Example Falling debris from hang-ups or dead trees. The risk Head injury. How I control it I wear protective head gear. I identify and make note of any overhead hazards for future re-measurement or auditing.
Underfoot hazard
Example Slippery/wet ground. The risk Slips and trips. How I control it I wear the correct footwear and pay close attention to where I am walking.
Weather

Example Sun. The risk Sunburn / heat stroke. How I control it I wear a hat. I use sun block and protective clothing.
Other forest operations
Example Felling operation. The risk Falling trees, machinery. How I control it Notify crew of intended work area. Keep 2 tree lengths away from felling operations.
Slash/logs on the ground
Example Difficult material to walk around. The risk Trips, falls, cuts. How I control it I wear correct footwear. Watch footing as I walk through the cutover. Step over or around obstacles rather than on them.
Working at heights
Example The positioning of the ladder could make me overreach causing me to fall. The risk Head injury, broken bones. How I control it I make sure my ladder is securely positioned with the feet at least ½ metre out from the tree. I position my ladder on the uphill side of the tree if I can.

2. Why is it important for hazard identification and risk assessment to be an on-going process? ☑

Assessor

This question supports PC 4.10.

Judgement statement

☐ The candidate correctly explains the reason for on-going hazard identification and risk assessment.

Example answers

- Every tree is different and can have different hazards which need to be identified.
- New risks can arise depending on the terrain or weather conditions.

3. Explain how each factor can create a new hazard or make work more hazardous when pruning. ☑

Assessor

This question supports PC 4.11.

Judgement statement

☐ The candidate correctly explains how each factor can create new hazards or make their work are more hazardous to a pruning operation.

Example answers

Weather
Wind can increase the risk from overhead hazards such as falling branches.
Terrain
Steep terrain can increase fatigue.
Hindrance
Can block safe ladder placement.

Assessor – record key points from candidate's verbal answers as accurately and fully as possible.		
These answers were written by:	☐ Candidate	☐ Assessor

Observation Checklist 1

You must be observed pruning plantation trees.

You will need to:

- Complete Part A of the checklist. Your assessor will complete Part B.
- Identify specific tree characteristics.
- Identify faults in a pruned stand.
- Select and use PPE and pruning equipment.
- Identify hazards.
- Determine pruning height.
- Open up the trees and carry out low and medium height pruning operations.
- Tally and report pruned trees.
- Attach any other evidence that shows your ability to prune plantation trees such as photos or worksite documents you prepared or completed.

You may be asked additional questions to check your knowledge and may need to demonstrate skills and/or carry out tasks more than once.

Note to the assessor

- Only tick off each task when satisfied the candidate can do it safely and consistently.
- All tasks must be carried out following accepted industry practice and worksite procedures.
- Where prompted, please record details of what you observed, e.g. comments about the candidate's performance, what the candidate did or said, and specific questions and responses.
- Attach any other evidence that shows what you observed and/or that supports your decision for the candidate's competency in the tasks, e.g. photos or worksite documents.
- Check the candidate has completed Part A and has attached any required evidence.

Assessor

This Observation Checklist supports PC 1.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9 and Outcome 3.

Judgement statement

☐ The completed Observation Checklist and attached evidence support the candidate's ability to identify tree characteristics, identify pruning faults in a pruned stand and prune plantation trees.

Part A: Candidate to complete	
Your name	Name recorded.
Worksite / company	Worksite / company recorded.
Stand / block ID	Stand / block ID recorded.

Part B: Assessor to complete

For each statement below, tick if you agree.

When preparing to prune plantation trees, the candidate: ☑

1. Selects and uses appropriate personal protective equipment (PPE). ☑

   Record the PPE the candidate uses. May include:

   - ☐ Gloves.
   - ☐ Wet weather gear.
   - ☐ Safety boots.
   - ☐ Harness.
   - ☐ Leggings
   - ☐ High visibility clothing.
   - ☐ Hard hat.
   - ☐ Other (please write):

   Assessor – Recorded information supports the candidate's ability to wear and use appropriate PPE.

2. Selects and uses appropriate pruning equipment. ☑

   Record the pruning equipment the candidate uses. May include:

   - ☐ Loppers.
   - ☐ Epicormic tool.
   - ☐ Callipers and/or gauge.
   - ☐ Ladder.
   - ☐ Height pole.
   - ☐ Other (please write):
   - ☐ Chains.
   - ☐ Jack saw.
   - ☐ Steps.
   - ☐ Water supply.
   - ☐ Spare parts.

   Assessor – Recorded information supports the candidate's ability to select and use appropriate pruning equipment.

3. Identifies hazards associated with pruning and effectively controls associated risks. **Six** hazards must be identified. ☑

- ☐ Stand or block hazards.
- ☐ Working at heights.
- ☐ Use of tools.
- ☐ Slash.
- ☐ Other workers.
- ☐ Surrounding vegetation.
- ☐ Terrain.
- ☐ Ground conditions.
- ☐ Overhead hazards.
- ☐ Weather conditions.
- ☐ Other (please write):

Record how the candidate effectively controls risks associated with each hazard identified.

Assessor – Recorded information supports the candidate's ability to identify pruning hazards and effectively control associated risks. **Six** hazards must be identified.

4. Identifies pruning faults in a pruned stand and explains how to prevent and/or rectify each pruning fault. May include: ☑

- ☐ Collar damage.
- ☐ Coat hangers.
- ☐ Epicormics.
- ☐ Height.
- ☐ Over pruning.
- ☐ Under pruning.
- ☐ Bark damage.
- ☐ Branches remaining.
- ☐ Other (please write):

Record how the candidate would prevent and/or rectify each fault identified.

Assessor – Recorded information supports the candidate's ability to identify, prevent and/or rectify pruning faults.

5. Determines pruning height. May include: ☑

- ☐ Crown is visually measured.
- ☐ Calliper is used to determine pruned height.
- ☐ Reach of equipment is estimated.
- ☐ Other (please write):

Assessor – Recorded information supports the candidate's ability to determine pruning height.

6.	Opens up tree for low pruning. Must include: ☑ Removing branches that block access. ☑ Pruning from bottom up. ☑ Circling the tree once. **Assessor** – **Each** box must be ticked.	☑
7.	Opens up tree for medium pruning. Must include: ☑ Checking for overhead hazards. ☑ Correct ladder placement. **Assessor** – **Each** box must be ticked.	☑
8.	Please comment on the candidate's ability to prepare for pruning. Comments support the candidate's ability to prepare for pruning.	
When pruning plantation trees, the candidate:		☑
9	Prunes tree using ergonomic techniques. May include: ☐ Correct body position. ☐ Correct ladder placement. ☐ Other (please write): **Assessor** – Recorded information supports the candidate's ability to use ergonomic techniques when pruning trees.	☑
10.	Cuts branches flush with the branch collar.	☑
11.	Removes epicormics safely and correctly. Must include: ☑ Using correct tools. ☑ Leaving no scarring. ☑ Using correct techniques. ☑ Using correct body position. ☑ Double cut / scarf. ☑ No draw wood. **Assessor** – Recorded information supports the candidate's ability to remove epicormics safely and correctly. **Each** box must be ticked.	☑

12.	Removes large branches safely and correctly. Must include: ☑ Double cut. ☑ Scarf cut. ☑ No tearing. ☑ No draw wood. **Assessor – Each** box must be ticked.	☑
13.	Tallies pruned trees correctly. Record number tallied. **Assessor –** Recorded information supports the candidate's ability to tally pruned trees.	☑
14.	Reports pruned trees to supervisor. Record name of supervisor. **Assessor –** Recorded information supports the candidate's ability to report pruned trees to supervisor.	☑
15.	Please comment on the candidate's ability to carry out low and medium pruning. Comments support the candidate's ability to carry out low and medium pruning of plantation trees safely and correctly.	
Throughout the observation, the candidate:		☑
16.	Completes all the above tasks in accordance with: ☑ Worksite procedures. ☑ Job prescription requirements. ☑ Machine and equipment manufacturer's requirements. ☑ Accepted industry practice.	☑

Please provide specific comments on the candidate's ability to prune plantation trees under supervision.

Any comments support the candidate's competency.

I confirm that: • I have observed the candidate carry out all the above tasks to the standard required. • The candidate has demonstrated competency in pruning planation trees under supervision.				☑ Yes ☐ No	
Assessor name	Assessor identified	**Signature**	Signed by assessor	**Date**	Date recorded

Worksite Verification

Assessor

This Worksite Verification supports Outcome 3 and PC 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, and 4.9.

Judgement statements

☐ The form has been completed by someone who meets the criteria below.

☐ The completed form provides evidence of the candidate's ability to perform the required tasks / skills to worksite or operational standards.

Note to the worksite verifier

- The assessor **takes this form into account** when making their decision about the candidate's competency. It helps provide further evidence of the candidate's skills and knowledge beyond what the assessor can directly observe or where worksite requirements may vary.
- This form must be completed by someone who:
  - Has been approved by the assessor.
  - Has expertise in the assessed tasks (see Observation Checklist for details) Regularly supervises or manages the candidate in their worksite or operation.
- In-house and/or provider assessors are not required to complete this form but may ask another suitable verifier to complete it if further evidence of competency is required.

Worksite verifier to complete

I confirm that :	☑
1. Has pruned plantation trees, including: ☑ Demonstrating knowledge of pruning faults. ☑ Pruning plantation trees under supervision.	☑
2. Can consistently and safely do the above to the standard of this operation.	☑
3. Met worksite and operational requirements.	☑
4. Completed any attached documentation to worksite / operational requirements.	☑

Please comment on the candidate's ability to prune planation trees under supervision.

Verifier name and title		**Signature**	
Phone / email		**Date**	