National Occupational Skill Standard (NOSS)

Occupational Title : **Kiwifruit Grower**

Level : **1**

Sector : **Agriculture**

Sub - Sector : **Plant Science**

NOSS ID/NSCO ID :

ISCO NO :

Council for Technical Education and Vocational Training

NATIONAL SKILL TESTING BOARD

Madhyapur Thimi-17, Sanothimi, Bhaktapur, Nepal

Developed: 05-09-2021 (20-05-2078)

2045

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3.	Mr. Shukraraj Rai	Member	Kiwi Farmer, Sandakpur, Femguru, Ilam.
4.	Ms. Sirjana Yogi	Member	Ratna Kumar Vantawa Polytechnic, Sakhejung, Ilam.
5.	Ms. Angela Bedari	Member	Ratna Kumar Vantawa Polytechnic, Sakhejung, Ilam.
6.	Mr. Mahananda Ojha	Member	Kiwi Farmer, Ilam Municipality, Ilam.
7.	Mr. Yuvraj Adhikari	Member	Ratna Kumar Vantawa Polytechnic, Sakhejung, Ilam.
8.	Mr. Deu Kumar Rai	Member	Maipokhari Herbal Organic Agriculture Farm, Sandakpur, Ilam.
9.	Mr. Dhan Kumar Rai	Member	Kiwi Farmer, Sandakpur, Chhange, Ilam.
10.	Mr. Mila Kumari Khatri	Member	Kiwi Farmer, Ilam Municipality, Sakhejung, Ilam.

DACUM Coordinator /Facilitator:

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DACUM Workshop on 7 and 8 Falgun 2077

The National Occupational Skill Standard Developed by:

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Recommended by Agriculture Technical Sub Committee: 05 September 2021 (20 Bhadra 2078)

1	**Occupational Title: Kiwifruit Grower** **Level: 1**
2	**Job Description:** Kiwifruit grower, L-1 prepares kiwifruit nursery, performs kiwifruit farming and post harvesting activities.
3	**UNITS OF COMPETENCY:** 1. Prepare nursery. 2. Perform kiwifruit farming. 3. Perform post harvesting activities. 4. Perform communication. 5. Develop professionalism. ***Note: Units 4 and 5 are not for testing purpose.***
4	**Qualifying Notes/Prerequisites:** • Physical Requirements: Sound health • Entry Requirements: As per NSTB rules **Additional Information:** • Assessment Types: Performance test only • Assessment Duration: 4 to 4:30 hours (Single Competency) 4:30 to 5:30 hours (All Competency) • Recommended Group Size: 8 to 10 candidates

5	**Unit No:1** **Unit Title: Prepare nursery**	**Unit code:**

Elements of competency	Performance standards
1.1 Prepare tools, equipment and materials	1.1.1 ***Personal protective equipment*** (PPE) used in accordance with task requirement. 1.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 1.1.3 ***Materials*** collected and prepared in accordance with task requirements.
1.2 Prepare compost	1.2.1 1.5m- 2m long, 1m-1.25m wide and 1m deep two compost pits prepared. 1.2.2 Materials placed in a pits layer by layer maintaining thickness of 15-25cm in pit method or piled up on ground layer by layer up to 1m above ground level as a heap in heap method. 1.2.3 Starter and water sprayed uniformly during piling process. 1.2.4 Compost covered with ***covering materials.*** 1.2.5 Compost materials stacked/heaped upside down into another pit.
1.3 Prepare Jhol Mal	1.3.1 1/3-part of plant leaves, ash and livestock dung, 1/3-part of water and 1/3-part of livestock urine mixed uniformly in a drum. 1.3.2 Drum lid tightly covered and placed in a sunny place. 1.3.3 Liquid manure stirred time to time.
1.4 Construct plastic tunnel	1.4.1 Bamboo strips cut to required dimension. 1.4.2 Bamboo strips inserted in half-moon shape and tightly fixed at distance of 1m over the bed. 1.4.3 Plastic sheet uniformly laid over arch and tightly fixed.
1.5 Prepare nursery beds	1.5.1 ***Foreign materials*** removed from land and waste disposed as per ***types of waste.*** 1.5.2 Land ploughed, clods broken, land pulverized and leveled. 1.5.3 Manure, soil and sand mixed uniformly in 1:2:1 ratio. 1.5.4 ***Bed*** prepared according to seasons. 1.5.5 50 cm wide passage maintained between two beds.

	1.6 Perform seed extraction	1.6.1 ***Healthy fruits*** collected and preserved till ripen. 1.6.2 Seeds separated from ripen fruits. 1.6.3 Floating seeds discarded and remaining seeds dried in shade. 1.6.4 Dried seeds stored at 3-7 degree centigrade.
	1.7 Irrigate nursery	1.7.1 ***Irrigation system*** prepared based on available ***water source.*** 1.7.2 Irrigation schedule prepared on the basis of soil type and season. 1.7.3 Water applied as per soil moisture content without damaging saplings. 1.7.4 Drain system prepared and excess water drained from the nursery bed.
	1.8 Perform seed sowing	1.8.1 0.5cm deep straight furrows drawn on nursery bed at a distance of 10cm. 1.8.2 Furrows filled with soil-manure mixture**.** 1.8.3 Treated seeds mixed with sand and uniformly spread over the furrows and covered with mixture of soil and manure. 1.8.4 Bed mulched with ***mulching materials.*** 1.8.5 Nursery bed thoroughly irrigated without damaging seeds and beds. 1.8.6 Mulching removed when seeds start germinating. 1.8.7 Seeds sown in seed trays filled with cocopeat and soil-manure mixture alternatively.
	1.9 Transplant seedling	1.9.1 Secondary nursery prepared for transplanting. 1.9.2 Seedlings with 4-5 leaves uprooted from primary nursery without damaging roots. 1.9.3 Seedlings transplanted maintaining ***appropriated distance*** between plants. 1.9.4 Secondary nursery irrigated without damaging saplings.
	1.10 Perform scion selection	1.10.1 ***Cultivar of choice*** identified for farming. 1.10.2 Pencil sized, brown colored, matured stems selected for scion. 1.10.3 Wax evenly applied on cut branches and wrapped.
	1.11 Perform tongue grafting	1.11.1 Pencil sized matured rootstock selected. 1.11.2 Rootstock prepared with smooth and slanting cut. 1.11.3 3-6cm long smooth slanting cut made at 5-10cm above the base of rootstock. 1.11.4 Vertical down cut made at the center of the slanting cut. 1.11.5 Similar slanting cut made at the base of scion with a vertical upward cut at the center of

		the slanting cut. 1.11.6 Cut ends of scion stick inserted into cut part of rootstock and wrapped tightly. 1.11.7 Graft covered with a transparent poly bag. 1.10.4 Tape removed once the rootstock and scion ends are joined together.
	1.12 Perform side grafting	1.12.1 Pencil sized matured rootstock selected. 1.12.2 Rootstock topped off at the height of 5-10cm and 1-1.25cm vertical down cut made at the side of rootstock. 1.12.3 1-1.25cm slanting cut made at the base of scion. 1.12.4 Cut ends of scion stick inserted into cut part of rootstock and wrapped tightly. 1.12.5 Graft covered with a transparent poly bag. 1.12.6 Tape removed once the rootstock and scion end are joined together.
	1.13 Protect sapling	1.13.1 Visual inspection performed and recorded. 1.13.2 Weeds and unhealthy saplings removed from nursery bed and disposed as per ***3R's principle.*** 1.13.3 ***Plant's diseases and harmful insects*** identified based on signs and symptoms. 1.13.4 ***Suitable methods*** applied as per plant's diseases and insects. 1.13.5 Bio/chemical pesticide applied using **appropriate *methods***. 1.13.6 Secondary nursery bed covered with shade net. 1.13.7 Stakes inserted next to grafted saplings and saplings tied securely with stakes. 1.13.8 Branches arising below grafting point removed.
6	**Task Performance Requirements (Tools, Equipment and Materials):** • Grafting tape, grafting knife, grafting machine, wooden saw, scissor, chopping board, hammer, hacksaw, knife, axe, sickle, secateurs, shovel, coco peat, drum, spade, hoe, wax, stake, plastic roll, silpaulin, garden pipe, tray, rake, nails, sprayer, pesticides, bucket, mug, measuring tape, polybag, thermometer, cartoon tape, sprinkler, watering can, measuring bucket/jar, rootex, agriculture lime, manure, jhol mal, drip set, bamboo, rope, protective paint, GI wire, PVC pipe, ladder, wooden peg, insect net, agro/shade net, cotton cloths, whisk, baskets, thunche, doko, Kuto, Kodalo, gal/khanti, pick, wheel barrow, litters, bricks, bedding materials, covering materials, seeds, freezer, seedlings, samplings,	

	livestock dung, urine, sand, ash, plant leaves, marker pen, pen, paper, register, first aid kit and personal protective equipment (PPE).
7	**Safety and Hygiene (Occupational Health and Safety):** • Use personal protective equipment. • Safe handling of materials, tools and equipment. • Hazards involved in lifting tools, equipment and materials. • Apply protective measures against pesticides. • Safe use of debris. • Prevent from cutting hazards.

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• Tools and equipment:
	  ○ Types
	  ○ Uses
	  ○ Safe handling
	• Nursery
	  ○ Introduction
	  ○ Primary and secondary nursery
	  ○ Factors of site selection
	• Manure
	  ○ Introduction
	  ○ Types
	  ○ Preparation techniques
	  ○ Application techniques
	• Construction of plastic tunnel
	• Nursery bed
	  ○ Sunken, raised and flat bed
	  ○ Preparation techniques
	• Nursery shed preparation
	• Seeds and sapling
			• Read and interpret manufacturer's instruction

	○ Introduction ○ Quality ○ Seed extraction ○ Sowing methods • Grafting ○ Introduction ○ Scion selection ○ Grafting types and techniques • Transplanting ○ Introduction ○ Method ○ Protection • Irrigation ○ Introduction ○ Types ○ Selection of irrigation system ○ Irrigation schedule • Nursery plant protection ○ Introduction ○ Disease, pest and weeds ○ Sign, symptoms and treatment		

	• Waste management • Record keeping and documentation • Occupational health and safety rules and regulations • Importance of first aid kit		

9	**Assessment of Competency**					
	Unit: 1 **Unit Title: Prepare nursery**					
	Candidate Details			**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:			Assessors' Name 1. 2. 3.		ID/License No:

Element of competency	**Performance Standards**	**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
1.1 Prepare tools, equipment and materials	1.1.1 ***Personal protective equipment*** (PPE) used in accordance with task requirement. 1.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 1.1.3 ***Materials*** collected and prepared in accordance with task requirements.				
1.2 Prepare compost	1.2.1 1.5m- 2m long, 1m-1.25m wide and 1m deep two compost pits prepared. 1.2.2 Materials placed in a pits layer by layer maintaining thickness of 15-25cm in pit method or piled up on ground layer by layer up to 1m above ground level as a heap in heap method. 1.2.3 Starter and water sprayed uniformly during piling process. 1.2.4 Compost covered with ***covering materials.*** 1.2.5 Compost materials stacked/heaped upside down into				

	another pit.				
1.3 Prepare Jhol Mal	1.3.1 1/3-part of plant leaves, ash and livestock dung, 1/3-part of water and 1/3-part of livestock urine mixed uniformly in a drum. 1.3.2 Drum lid tightly covered and placed in a sunny place. 1.3.3 Liquid manure stirred time to time.				
1.4 Construct plastic tunnel	1.4.1 Bamboo strips cut to required dimension. 1.4.2 Bamboo strips inserted in half-moon shape and tightly fixed at distance of 1m over the bed. 1.4.3 Plastic sheet uniformly laid over arch and tightly fixed.				
1.5 Prepare nursery beds	1.5.1 ***Foreign materials*** removed from land and waste disposed as per ***types of waste.*** 1.5.2 Land ploughed, clods broken, land pulverized and leveled. 1.5.3 Manure, soil and sand mixed uniformly in 1:2:1 ratio. 1.5.4 ***Bed*** prepared according to seasons. 1.5.5 50 cm wide passage maintained between two beds.				
1.6 Perform seed extraction	1.6.1 ***Healthy fruits*** collected and preserved till ripen. 1.6.2 Seeds separated from ripen fruits. 1.6.3 Floating seeds discarded and remaining seeds dried in shade. 1.6.4 Dried seeds stored at 3-7 degree centigrade.				
1.7 Irrigate nursery	1.7.1 ***Irrigation system*** prepared based on available ***water source.*** 1.7.2 Irrigation schedule prepared on the basis of soil type and season. 1.7.3 Water applied as per soil moisture content without damaging saplings.				

	1.7.4 Drain system prepared and excess water drained from the nursery bed.				
1.8 Perform seed sowing	1.8.1 0.5cm deep straight furrows drawn on nursery bed at a distance of 10cm. 1.8.2 Furrows filled with soil-manure mixture**.** 1.8.3 Treated seeds mixed with sand and uniformly spread over the furrows and covered with mixture of soil and manure. 1.8.4 Bed mulched with ***mulching materials.*** 1.8.5 Nursery bed thoroughly irrigated without damaging seeds and beds. 1.8.6 Mulching removed when seeds start germinating. 1.8.7 Seeds sown in seed trays filled with cocopeat and soil-manure mixture alternatively.				
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1.11 Perform tongue grafting	1.11.1 Pencil sized matured rootstock selected. 1.11.2 Rootstock prepared with smooth and slanting cut. 1.11.3 3-6cm long smooth slanting cut made at 5-10cm above the base of rootstock. 1.11.4 Vertical down cut made at the center of the slanting cut.				

	1.11.5 Similar slanting cut made at the base of scion with a vertical upward cut at the center of the slanting cut. 1.11.6 Cut ends of scion stick inserted into cut part of rootstock and wrapped tightly. 1.11.7 Graft covered with a transparent poly bag. 1.11.8 Tape removed once the rootstock and scion ends are joined together.				
1.12 Perform side grafting	1.12.1 Pencil sized matured rootstock selected. 1.12.2 Rootstock topped off at the height of 5-10cm and 1-1.25cm vertical down cut made at the side of rootstock. 1.12.3 1-1.25cm slanting cut made at the base of scion. 1.12.4 Cut ends of scion stick inserted into cut part of rootstock and wrapped tightly. 1.12.5 Graft covered with a transparent poly bag. 1.12.6 Tape removed once the rootstock and scion end are joined together.				
1.13 Protect sapling	1.13.1 Visual inspection performed and recorded. 1.13.2 Weeds and unhealthy saplings removed from nursery bed and disposed as per ***3R's principle.*** 1.13.3 ***Plant's diseases and harmful insects*** identified based on signs and symptoms. 1.13.4 ***Suitable methods*** applied as per plant's diseases and insects. 1.13.5 Pesticide applied using **appropriate *methods***. 1.13.6 Secondary nursery bed covered with shade net. 1.13.7 Stakes inserted next to grafted saplings and saplings tied securely with stakes. 1.13.8 Branches arising below grafting point removed.				

WT- Written Test **OQ**- Oral Question **PT-** Practical Test **DO** – Direct Observation **SR**- Supervisor's report **SN**–Simulation

RP- Role Play **PG –**Photographs **VD**- Video **CT** – Certificates **TS** – Testimonials (Reward) **PP** – Product Produced

CS – Case Study

Range Statement

Variable	Range
Personal protective equipment	*May include but not limited to:* • Helmet • Hat • Mask • Apron • Goggles • Gloves • Safety shoes • Safety belt

Materials	*May include but not limited to:*
	• Compost
	  ○ Organic matter: litters, kitchen waste, dung, urine
	  ○ Starter: compost, Effective micro-organism (EM1), agriculture lime, urea
	• Jhol Mal
	  ○ Livestock dung
	  ○ Livestock urine
	  ○ Water
	  ○ Effective micro-organism (EM1)
	  ○ Plant leaves: Sishno, Titepati, Banmara, Khirro, Mewa, Neem, Bakaino, Asuro
	  ○ Ash
	• Plastic tunnel

	○ Bamboo strip ○ Plastic
Covering materials	*May include but not limited to:* • Straw • Litters • Mixture of soil and livestock dung • Plastic
Foreign materials	*May include but not limited to:* • Plant debris • Weed • Pebble • Stone • Plastic • Metals • Glass
Types of waste	*May include but not limited to:* • Bio degradable • Non bio degradable
Bed	*May include but not limited to:* • Raised bed: 1 m wide, 3m long and 15 cm raised • Sunken bed: 1 m wide, 3m long and 15 cm deep

Healthy fruits	*May include but not limited to:* • Mature • Big size • Colour • Shape
Irrigation system	*May include but not limited to:* • Sprinkler • Drip • Canal/channels • Garden pipe
Water source	*May include but not limited to:* • Well • Tube well • Pond • River
Mulching materials	*May include but not limited to:* • Straw • Litters • Mixture of soil and livestock dung • Plastic
Appropriated distance	*May include but not limited to:* • In-situ grafting: 20cm • Bench grafting: 10 cm

Cultivar of choice	*May include but not limited to:*
	• Green kiwifruit
	  ○ Male Scion: Tumori for hayward and Matuwa for other variety
	  ○ Female Scion: Hayward/ Alison Monty, Bruno, Abbot
	• Red kiwifruit/Jeni Soyu

3R's principle	*May include but not limited to:* • Reduce • Reuse • Recycle

Plant's diseases and harmful insects	*May include but not limited to:*
	• Plant's diseases
	  ○ Fungal
	  ○ Bacterial
	  ○ Viral
	• Harmful insects
	  ○ Caterpillar
	  ○ Ants
	  ○ White grubs
	  ○ Aphids
	  ○ Cut worms
	• Nematodes

Suitable methods	*May include but not limited to:* • Destroy alternative host • Uprooting • Burning • Hand picking • Trapping • Bio/chemical pesticides
Appropriates methods	*May include but not limited to:* • Spraying • Drenching • Applying

5	**Unit No: 2** **Unit Title: Perform kiwifruit farming**	**Unit code:**

Elements of competency	Performance standards
2.1 Prepare tools, equipment and materials	2.1.1 ***Personal protective equipment (PPE)*** used in accordance with task requirement. 2.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 2.1.3 Materials collected and prepared in accordance with task requirements.
2.2 Collect soil sample	2.2.1 Representative sampling points marked in 'Z' or 'N' manner covering at least 5 points. 2.2.2 90-100cm deep pits dug at marked points. 2.2.3 Soil samples collected from ***different layers*** and thoroughly mixed separately as per layer. 2.2.4 Half to one kilogram of thoroughly mixed sample packed and labeled with ***required information*** and sent for test.
2.3 Prepare land	2.3.1 ***Foreign materials*** removed and segregated as per ***types of waste.*** 2.3.2 Land ploughed, clods broken, pulverized and leveled. 2.3.3 Soil treated as per soil test report. 2.3.4 Planting pits of required ***dimension*** prepared as per ***layout***. 2.3.5 Planting pits filled up with soil, manures and fertilizers. 2.3.6 1-1.5 m high fence prepared around the orchard.
2.4 Perform transplanting	2.4.1 Grafted sapling transplanted at the center of pit without damaging roots. 2.4.2 Male sapling transplanted at the center surrounded by female in the ratio of 1:5 to 1:8. 2.4.3 1-1.5m long staking provided to plants. 2.4.4 Land mulched around the planted saplings. 2.4.5 Transplanted orchard watered uniformly and gently. 2.4.6 Transplanted saplings tagged with ***plant information.***
2.5 Irrigate orchard	2.5.1 ***Irrigation system*** prepared based on available ***water source.*** 2.5.2 Irrigation schedule prepared on the basis of soil type and season. 2.5.3 Water applied uniformly and gently without damaging plants. 2.5.4 Drain system prepared and excess water drained from orchard.

	2.6 Perform intercultural operations	2.6.1 Weeds and unhealthy saplings removed from orchard and disposed as per ***3R's principle.*** 2.6.2 Hoeing done without damaging root. 2.6.3 New saplings replanted on the uprooted place. 2.6.4 Orchard irrigated at ***critical stage*** of growth. 2.6.5 Excess water drained from orchard. 2.6.6 Small size, odd shape and damaged fruits thinned out from congested bunch.
	2.7 Apply manure and fertilizer	2.7.1 Manure and fertilizer schedule prepared. 2.7.2 Fertilizer placed around plants after hoeing and covered with soil. 2.7.3 Nutrients provided to plants with deficiency symptoms.
	2.8 Perform training and pruning	2.8.1 Prepared ***support system*** placed in between plants. 2.8.2 Vine trained in support system. 2.8.3 ***Unwanted branches*** cut and Bordeaux paste applied on cut ends.
	2.9 Perform crops protection	2.9.1 Visual inspection performed and recorded. 2.9.2 ***Plant's diseases and harmful insects*** identified based on signs and symptoms. 2.9.3 ***Suitable methods*** applied as per plant's diseases and insects. 2.9.4 Dose of bio/chemical pesticide solution prepared based on manufacturer's instruction. 2.9.5 Bio/chemical pesticide applied in **appropriate *method*** and ***time***.
	2.10 Perform harvesting	2.10.1 Kiwifruits to be harvested identified based on ***maturity stages***. 2.10.2 Kiwifruits harvested without damage. 2.10.3 Kiwifruits placed in a ***container***. 2.10.4 Kiwifruits stored in clean, dry and ventilated room. 2.10.5 Tools and equipment cleaned, maintained, stored and record updated.
6	**Task Performance Requirements (Tools, Equipment and Materials):** • Sickle, secateurs, shovel, measuring tape, garden pipe, tray, rake, sprayer, bio/chemical pesticides, scissor, blade, agriculture lime, fertilizer, manure, spade, hoe, bucket, wheel barrow, sprinkler, watering can, measuring bucket, drip set, insect net, hail net, agro net, basket, thunche, doko, Kuto, Kodalo, gal/khanti, pick, polybag, vine stitch machine, labelling tag, support system, spraying machine, pruning saw, hammer, rope, nail, knife, axe, ladder, garden pipe, drip set, looper, Bordeaux paste, wheel barrow, refractometer, marker pen, pen, paper, register,	

	covering materials, saplings, seedlings, livestock dung, plant leaves, container, first aid kit and personal protective equipment (PPE).
7	**Safety and Hygiene (Occupational Health and Safety):** • Use personal protective equipment. • Safe handling of materials, tools and equipment. • Apply protective measures against chemical fertilizer. • Safe use of pesticides. • Safe handling of debris. • Prevent from cutting hazards

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• Tools and equipment:
	  ○ Types
	  ○ Uses
	  ○ Safe handling
	• Kiwifruit farming
	  ○ Introduction
	  ○ Variety
	  ○ Factor affecting kiwifruit farming
	• Soil sampling technique
	• Land selection
	• Land layout
	• Saplings
	  ○ Introduction
	  ○ Variety
	  ○ Quality
	  ○ Transplanting methods
	  ○ Handling
	• Irrigation
	  ○ Introduction
			• Read and interpret manufacturer's instruction

	○ Types ○ Selection of irrigation system ○ Irrigation schedule • Intercultural operations ○ Weeding ○ Hoeing ○ Thinning • Manure and fertilizer ○ Introduction ○ Types ○ Preparation techniques ○ Application techniques ○ Nutrients • Support System ○ Introduction ○ Types ○ Methodology • Training and pruning ○ Introduction ○ Winter and summer pruning • Crop protection		

	○ Introduction ○ Harmful and useful insects ○ Plant disease ○ Safe use of pesticides ○ Bordeaux mixture/paste • Harvesting ○ Harvesting time and season ○ Maturity indices ○ Handling techniques • Waste management • Record keeping and documentation • Occupational health and safety rules and regulations • Importance of first aid kit		

9	**Assessment of Competency**				
	Unit: 2 **Unit Title: Perform kiwifruit farming**				
	Candidate Details		**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:		Assessors' Name 1. 2. 3.		ID/License No:

Element of competency	**Performance Standards**	**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
2.1 Prepare tools, equipment and materials	2.1.1 ***Personal protective equipment (PPE)*** used in accordance with task requirement. 2.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 2.1.3 Materials collected and prepared in accordance with task requirements.				
2.2 Collect soil sample	2.2.1 Representative sampling points marked in 'Z' or 'N' manner covering at least 5 points. 2.2.2 90-100cm deep pits dug at marked points. 2.2.3 Soil samples collected from ***different layers*** and thoroughly mixed separately as per layer. 2.2.4 Half to one kilogram of thoroughly mixed sample packed and labeled with ***required information*** and sent for test.				
2.3 Prepare land	2.3.1 ***Foreign materials*** removed and segregated as per ***types of waste.*** 2.3.2 Land ploughed, clods broken, pulverized and leveled. 2.3.3 Soil treated as per soil test report.				

	2.3.4 Planting pits of required ***dimension*** prepared as per ***layout***. 2.3.5 Planting pits filled up with soil, manures and fertilizers. 2.3.6 1-1.5 m high fence prepared around the orchard.				
2.4 Perform transplanting	2.4.1 Grafted sapling transplanted at the center of pit without damaging roots. 2.4.2 Male sapling transplanted at the center surrounded by female in the ratio of 1:5 to 1:8. 2.4.3 1-1.5m long staking provided to plants. 2.4.4 Land mulched around the planted saplings. 2.4.5 Transplanted orchard watered uniformly and gently. 2.4.6 Transplanted saplings tagged with ***plant information.***				
2.5 Irrigate orchard	2.5.1 ***Irrigation system*** prepared based on available ***water source.*** 2.5.2 Irrigation schedule prepared on the basis of soil type and season. 2.5.3 Water applied uniformly and gently without damaging plants. 2.5.4 Drain system prepared and excess water drained from orchard.				
2.6 Perform intercultural operations	2.6.1 Weeds and unhealthy saplings removed from orchard and disposed as per ***3R's principle.*** 2.6.2 Hoeing done without damaging root. 2.6.3 New saplings replanted on the uprooted place. 2.6.4 Orchard irrigated at ***critical stage*** of growth. 2.6.5 Excess water drained from orchard. 2.6.6 Small size, odd shape and damaged fruits thinned out from congested bunch.				
2.7 Apply manure and fertilizer	2.7.1 Manure and fertilizer schedule prepared. 2.7.2 Fertilizer placed around plants after hoeing and covered with soil. 2.7.3 Nutrients provided to plants with deficiency symptoms.				
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2.9 Perform crops	2.9.1 Visual inspection performed and recorded.				

protection	2.9.2 ***Plant's diseases and harmful insects*** identified based on signs and symptoms. 2.9.3 ***Suitable methods*** applied as per plant's diseases and insects. 2.9.4 Dose of bio/chemical pesticide solution prepared based on manufacturer's instruction. 2.9.5 Bio/chemical pesticide applied in **appropriates *method*** and ***time***.				
2.10 Perform harvesting	2.10.1 Kiwifruits to be harvested identified based on ***harvesting/maturity stages***. 2.10.2 Kiwifruits harvested without damage. 2.10.3 Kiwifruits placed in a ***container***. 2.10.4 Kiwifruits stored in clean, dry and ventilated room. 2.10.5 Tools and equipment cleaned, maintained, stored and record updated.				

WT- Written Test **OQ**- Oral Question **PT-** Practical Test **DO** – Direct Observation **SR**- Supervisor's report **SN**–Simulation

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CS – Case Study

Range Statement

Variable	Range
Personal protective equipment	*May include but not limited to:* • Helmet • Hat • Mask • Apron • Goggles • Gloves • Safety shoes • Safety belts
Different layers	*May include but not limited to:* • 1st layer: 0-30cm depth • 2nd layer: 30-60 cm depth • 3rd layer: 60-90cm depth
Required information	*May include but not limited to:* • Name and address of farmer • Land location • Depth of sample • Date of sampling • Previous crop grown • Test required: soil pH, texture, Nitrogen, Phosphorus, Potassium

Foreign materials	*May include but not limited to:* • Plant debris • Weed • Trash • Pebble • Stone
Types of waste	*May include but not limited to:* • Bio degradable • Non bio degradable
Dimension	*May include but not limited to:* • Pit to pit distance 7 to 8 m • Pit size 1m wide and 1m deep
Layout	*May include but not limited to:* • Contour • Rectangular
Plant information	*May include but not limited to:* • Variety • Plantation date
Irrigation system	*May include but not limited to:* • Sprinkler • Drip • Canal/channels • Garden pipe

Water sources	May include but not limited to: • Well • Tube wells • River • Pond
3R's principle	May include but not limited to: • Reduce • Reuse • Recycle
Critical stage	*May include but not limited to:* • After transplanting • After top dressing • After hoeing • During flowering and fruiting
Support system	*May include but not limited to:* • T-bar • Overhead pargolla
Unwanted branches	*May include but not limited to:* • Dried • Diseased • Water shoot • Deformed • Damaged

	• Congested • Excess/over growth

Plant's diseases and harmful insects	*May include but not limited to:*
	• Plant's diseases
	  ○ Fungal
	  ○ Bacterial
	  ○ Viral
	• Harmful insects
	  ○ Caterpillar
	  ○ Ants
	  ○ White grubs
	  ○ Cut worms
	• Nematodes

Suitable methods	*May include but not limited to:* • Destroy alternative host • Uprooting • Burning • Hand picking • Trapping • Bordeaux mixture • Bio/chemical pesticides
Appropriate method	*May include but not limited to:* • Spraying • Drenching • Applying

Time	*May include but not limited to:* • Avoiding damage to bees during flowering time • Avoiding bright sunshine and strong wind
Maturity stages	*May include but not limited to:* • Leaves fallen • Seeds became black color • Soften the hairs in the fruit
Container	*May include but not limited to:* • Basket • Tray • Crate • Box

5	**Unit No: 3** **Unit Title: Perform post harvesting activities**	**Unit code:**

Elements of competency	Performance standards
3.1 Prepare tools, equipment and materials	3.1.1 ***Personal protective equipment (PPE)*** used in accordance with task requirement. 3.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 3.1.3 Materials collected and prepared in accordance with task requirements.
3.2 Perform grading	3.2.1 Harvested kiwifruit spread on clean surface with sufficient air circulation. 3.2.2 ***Unwanted materials*** removed from harvested kiwifruit without damaging. 3.2.3 Kiwifruit sorted on the basis of shape and size. 3.2.4 Graded kiwifruit kept separately and labelled.
3.3 Perform packaging	3.3.1 ***Packaging materials*** prepared according to ***purpose***. 3.3.2 Kiwifruit placed inside packaging materials and sealed. 3.3.3 ***Labels*** placed in packaging materials. 3.3.4 Kiwifruit stored in designated place. 3.3.5 Tools and equipment cleaned, maintained, stored and record updated.

6	**Task Performance Requirements (Tools, Equipment and Materials):** • Marker pen, pen, paper, register, rope, adhesive, label sticker, packing bag, weighting machine, packaging materials, sealing machine, sealing tape, scissors, needle, thread, knife, basket, doko, thunche, rope, plastic sheet, bucket, plastic bag, wheel barrow, first aid kit and personal protective equipment (PPE).
7	**Safety and Hygiene (Occupational Health and Safety):** • Use personal protective equipment. • Safe handling of materials, tools and equipment. • Safe handling of kiwifruit

8	Required Knowledge		
	Technical Knowledge	**Applied Calculation**	**Graphical Information**

	• Tools and equipment:
	  ○ Types
	  ○ Uses
	  ○ Safe handling
	• Introduction and importance of precooling
	• Grading
	  ○ Introduction
	  ○ Importance
	  ○ Grades
	• Storage
	  ○ Introduction
	  ○ Method
	  ○ Importance
	• Packaging and labelling
	• Marketing
	• Waste management
	• Record keeping and documentation
	• Occupational health and safety rules and regulations
	• Importance of first aid kit		

9	**Assessment of Competency**				
	Unit: 3 **Unit Title: Perform post harvesting activities**				
	Candidate Details		**Assessors Detail**		
	Candidate's Name: Registration Number: Symbol No: Test Centre: Test Date:		Assessors' Name 1. 2. 3.		ID/License No:

Element of competency	**Performance Standards**	**Standard Met**	**Standard Not Met**	**Evidence Type**	**Comments**
3.1 Prepare tools, equipment and materials	3.1.1 ***Personal protective equipment (PPE)*** used in accordance with task requirement. 3.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 3.1.3 Materials collected and prepared in accordance with task requirements.				
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Range Statement

Variable	Range
Personal protective equipment	*May include but not limited to:* • Helmet • Hat • Mask • Apron • Goggles • Gloves • Safety shoes
Unwanted materials	*May include but not limited to:* • Damaged • Leaves and twigs • Stones • Diseased
Packaging materials	*May include but not limited to:* • Bag • Cartoon box • Sack
Purpose	*May include but not limited to:* • Wholesale • Retail • Short distance • Long distance

Labels	*May include but not limited to:* • Place of origin • Date and batch number • Net Weight • Sack/Bag no