

National Occupational Skill Standard (NOSS)

Occupational Title : Vegetable Seed 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: 10-10-2021 (24-06-2078)

DACUM Panel:

S. No.	Name	Designation	Organization
1.	Mr. Saroj Tamang	Member	Seed Producer, Sanga, Kavre.
2.	Mr. Krishna Bikram Thapa	Member	Agriculture Worker, Dhulikhel, Kavre.
3.	Mr. Suman Lama	Member	Agriculture Worker, Dhulikhel, Kavre.
4.	Mrs. Rita Devi Adhikari	Member	Agriculture Worker, Panchkhal, Kavre.
5.	Mr. Jog Bahadur Basnet	Member	Seed Producer, Anekot, Kavre.
6.	Mr. Hari Saran Moktan	Member	Experience Leader Farmer, Panchkhal, Kavre
7.	Mrs. Jit Maya Tamang	Member	Agriculture Worker, Sankhu, Kavre.
8.	Mr. Mohan Thapa	Member	Experience Leader Farmer, Hokse, Kavre.
9.	Mr. Ram Jee Humagain	Member	Agriculture Worker, Kavre-2, Kavre.
10.	Mr. Huma Nath Thapa	Member	Agriculture Worker, Dhulikhel, Kavre.
11.	Mr. Laxmi Narayan Shrestha	Member	Experience Leader Farmer, Anekot, Kavre.
12.	Mr. Kaman Singh Tamang	Member	Seed Producer, Baluwa, Kavre

DACUM Coordinator /Facilitator:

Mr. Ram Hari Devkota, Deputy Director, NSTB

Mr. Ishwar Chandra Ghimire, Skill Testing Officer, NSTB

DACUM Workshop on 29 & 30 January 2012



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DACUM Verification Panel:

S. No.	Name	Designation	Organization
1.	Mr. Saroj Tamang	Member	Seed Producer, Sanga, Kavre.
2.	Mr. Shambhu Saran Thapa	Member	Experience Leader Farmer, Baluwa, Kavre.
3.	Mr. Khim Narayan Basnet	Member	Seed Producer, Dhulikhel, Kavre.
4.	Mr. Deepak Bikram Bista	Member	Seed Producer, Panchkhal, Kavre.
5.	Mrs. Roma Humagain	Member	Seed Producer, Hokes, Kavre.
6.	Mr. Som Bahadur Tamang	Member	Seed Producer, Anekot, Kavre
7.	Mr. Bishal Rana	Member	Seed Producer, Baluwa, Kavre
8.	Mr. Bishnu Bahadur Bhujel	Member	Experience Leader Farmer, Dhulikhel, Kavre.
9.	Ms. Kalpana Tamang	Member	Seed Producer, Panchkhal, Kavre.
10.	Mr. Karma Singh Tamang	Member	Experience Leader Farmer, Hokse, Kavre.
11.	Mrs. Shova Humagain	Member	Seed Producer, Anekot, Kavre.
12.	Mr. Laxmi Narayan Shrestha	Member	Experience Leader Farmer, Anekot, Kavre

Facilitator/ Recorder:

Mr. Ram Hari Devkota, Deputy Director, NSTB

Mr. Ishwar Chandra Ghimire, Skill Testing Officer, NSTB

Customized DACUM Workshop on 31 January 2012

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Technical Sub Committee:

S. No.	Name	Designation	Organization
1.	Dr. Hari Dahal	Coordinator	Agriculture Technical Sub Committee, National Skill Testing Board, Sanothimi, Bhaktapur.
2.	Dr. Kul Bahadur Basnet	Member	Director, National Skill Testing Board, Sanothimi, Bhaktapur.
3.	Mr. Dilaram Bhandari	Member	Chief, Seed Quality Control Center, Hariharbhawan, Lalitpur.
4.	Dr. Hari Bahadur K.C	Member	Sr. Technical Officer, NARC, Kathmandu.
5.	Mr. Tirtha Raj Pokharel	Member	Sr. Technical Officer, HRD, NARC.
6.	Mr. Yam Bhandari	Member	Consulting Trainer, National Skill Testing Board, Sanothimi, Bhaktapur.
7.	Mr. Tulsi K.C	Member	Sr. Skill Testing Officer, National Skill Testing Board, Sanothimi, Bhaktapur.
8.	Mr. Ishwar Chandra Ghimire	Member	Skill Testing Officer, National Skill Testing Board, Sanothimi, Bhaktapur.
9.	Mr. Prabin Raj Adhikari	Member- Secretary	Agriculture Technical Sub Committee, National Skill Testing Board, Sanothimi, Bhaktapur.

Recommended by Agriculture Technical Sub Committee: 10 October 2012



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The National Occupational Skill Standard Developed by:

No	Name	Designation	Organization
1.	Dr. Hari Dahal	Coordinator	Agriculture Technical Sub Committee National Skill Testing Board, Sanothimi, Bhaktapur
2.	Mr. Tek Bahadur Malla	Director	National Skill Testing Board Sanothimi, Bhaktapur
3.	Dr. Ramita Manandhar	Member	Freelancer, Horticulturist Kusunti, Lalitpur
4.	Mr. Kaushal Kumar Poudel	Member	Freelancer, Horticulturist Banasthali, Kathmandu
5.	Mr. Rudra Bahadur Bisunke	Member	Jorshalla Tarkri Biu Utpadak Sahakari sanstha Namobuddha, Kavre
6.	Mr. Rajendra Thapa	Member	Tissue Culture Prayogshala Panauti, Kavre
7.	Mr. Baikuntha Shrestha	Member-Secretary	Agriculture Technical Sub Committee National Skill Testing Board, Sanothimi, Bhaktapur
8.	Mr. Tulsi K. C.	Member	Sr. Skill Testing Officer, National Skill Testing Board Sanothimi, Bhaktapur
9.	Mr. Suresh Maharjan	Member	Skill Testing Officer, National Skill Testing Board Sanothimi, Bhaktapur
10.	Mr. Kishor Chandra Sharma	Member	Skill Testing Assistant, National Skill Testing Board Sanothimi, Bhaktapur

Recommended by Agriculture Technical Sub Committee: 10 October 2021 (24 Ashwin 2078)



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1	Occupational Title: Vegetable Seed Grower Level: 1
2	Job Description: Vegetable Seed Grower, L-1 prepares vegetable nursery, performs vegetable seed farming and vegetable seed processing.
3	UNITS OF COMPETENCY: <ol style="list-style-type: none"> 1. Prepare vegetable nursery. 2. Perform vegetable seed farming. 3. Perform vegetable seed processing. 4. Perform communication. 5. Develop professionalism. <i>*Note: Units 4 and 5 are not for testing purpose.</i>
4	Qualifying Notes/Prerequisites: <ul style="list-style-type: none"> • Physical Requirements: Sound health • Entry Requirements: As per NSTB rules Additional Information: <ul style="list-style-type: none"> • 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 vegetable 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 nursery beds	1.2.1 Foreign materials removed from land and waste disposed as per types of waste . 1.2.2 Land ploughed, clods broken, pulverized and levelled. 1.2.3 Bed prepared with a mixture of manure, soil and sand in 2:2:1 ratio according to seasons. 1.2.4 50cm wide passage maintained between two beds.
	1.3 Construct plastic tunnel	1.3.1 Bamboo strips cut to 1.5m to 2m length. 1.3.2 Bamboo strips inserted in half-moon shape and tightly fixed at 50cm distance. 1.3.3 Plastic sheet uniformly laid over arch and tightly fixed.
	1.4 Prepare polybag	1.4.1 10 cm X 15 cm Polybag filled with a mixture of manure, soil and sand in 2:2:1 ratio with compaction. 1.4.2 Polybags arranged together in a flatbed of 1m width. 1.4.3 Plastic sheet uniformly laid over arch and tightly fixed according to seasons.
	1.5 Perform seed sowing	1.5.1 Seed sown in a row two or three times deeper than diameter of seed. 1.5.2 Distance of 10cm maintained between rows. 1.5.3 Treated seeds mixed with sand and uniformly spread over the furrows and covered with mixture of soil and manure. 1.5.4 Bed mulched with mulching materials . 1.5.5 Nursery bed thoroughly irrigated without damaging seeds and beds. 1.5.6 Mulching removed when seeds start germinating. 1.5.7 Seeds sown in seed trays/poly bag filled with coco peat and soil-manure mixture alternatively.



	1.6 Irrigate nursery	1.6.1 Irrigation schedule prepared on the basis of soil type, season and water source . 1.6.2 Nursery bed irrigated as per soil moisture content without damaging seedling. 1.6.3 Drainage path prepared and excess water drained from the nursery bed.
	1.7 Perform hardening of seedling	1.7.1 Secondary nursery prepared for vegetable transplanting. 1.7.2 Seedlings with 4/5 leaves uprooted from primary nursery without damaging roots. 1.7.3 Seedlings transplanted maintaining 10cm to 15cm distance between plants. 1.7.4 Secondary nursery irrigated without damaging saplings.
	1.8 Protect seedling	1.8.1 Visual inspection performed and recorded. 1.8.2 Weeds, off type and unhealthy saplings removed from nursery bed and disposed as per 3R's principle . 1.8.3 Plant's diseases and harmful insects identified based on signs and symptoms. 1.8.4 Suitable methods applied to control plant's diseases and insects. 1.8.5 Secondary nursery bed covered with shade net/plastic according to season.
6	Task Performance Requirements (Tools, Equipment and Materials): <ul style="list-style-type: none"> Wooden saw, hammer, knife, axe, sickle, shovel, drum, PVC pipe, garden pipe, polybag, sprayer, spade, hoe, stake, plastic roll, silpaulin, tray, rake, nails, pesticides, bucket, mug, measuring tape, watering can, measuring jar, bamboo, rope, protective paint, insect net, agro/shade net, whisk, baskets, <i>thunche</i>, <i>doko</i>, <i>kuto</i>, <i>kodalo</i>, <i>gal/khanti</i>, pick, wheel barrow, coco peat, bedding materials, covering materials, seeds, seedlings, fertilizer, farm yard manure, sand, ash, mulching materials, marker pen, pen, paper, register, first aid kit and personal protective equipment (PPE). 	
7	Safety and Hygiene (Occupational Health and Safety): <ul style="list-style-type: none"> Use personal protective equipment. Safe handling of materials, tools and equipment. Hazards involved in lifting tools, equipment and materials. Apply protective measures against pesticides. Prevent from cutting hazards. 	



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> Tools and equipment: <ul style="list-style-type: none"> Types Uses Safe handling Nursery <ul style="list-style-type: none"> Introduction Factors of site selection Primary and secondary nursery Manure <ul style="list-style-type: none"> Introduction Types Preparation techniques Application techniques Construction of plastic tunnel/shed <ul style="list-style-type: none"> Introduction Preparation techniques Nursery bed <ul style="list-style-type: none"> Sunken, raised and flat bed Preparation techniques 		<ul style="list-style-type: none"> Read and interpret manufacturer's instruction



	<ul style="list-style-type: none"> • Polybag <ul style="list-style-type: none"> ○ Introduction ○ Size ○ Filling methods • Seeds <ul style="list-style-type: none"> ○ Introduction ○ Quality ○ Sowing methods • Hardening <ul style="list-style-type: none"> ○ Introduction ○ Purpose ○ Techniques • Transplanting <ul style="list-style-type: none"> ○ Introduction ○ Method ○ Seedling handling • Irrigation <ul style="list-style-type: none"> ○ Introduction ○ Method of irrigation ○ Irrigation schedule ○ Source of irrigation 		
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	<ul style="list-style-type: none"> • Drainage <ul style="list-style-type: none"> ○ Introduction ○ Importance ○ Methods • Nursery plant protection <ul style="list-style-type: none"> ○ Introduction ○ Disease, pest and weeds ○ Sign, symptoms and treatment ○ Beneficial insects ○ Harmful insects • Waste management • Record keeping and documentation • Occupational health and safety rules and regulations • Importance of first aid kit 		
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9	Assessment of Competency						
	Unit: 1 Unit Title: Prepare vegetable nursery						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			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 nursery beds		1.2.1 Foreign materials removed from land and waste disposed as per types of waste . 1.2.2 Land ploughed, clods broken, pulverized and levelled. 1.2.3 Bed prepared with a mixture of manure, soil and sand in 2:2:1 ratio according to seasons. 1.2.4 50cm wide passage maintained between two beds.					
1.3 Construct plastic tunnel		1.3.1 Bamboo strips cut to 1.5m to 2m length. 1.3.2 Bamboo strips inserted in half-moon shape and tightly fixed at 50cm distance.					



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	1.3.3 Plastic sheet uniformly laid over arch and tightly fixed.				
1.4 Prepare polybag	1.4.1 10 cm X 15 cm Polybag filled with a mixture of manure, soil and sand in 2:2:1 ratio with compaction. 1.4.2 Polybags arranged together in a flatbed of 1m width. 1.4.3 Plastic sheet uniformly laid over arch and tightly fixed according to seasons.				
1.5 Perform seed sowing	1.5.1 Seed sown in a row two or three times deeper than diameter of seed. 1.5.2 Distance of 10cm maintained between rows. 1.5.3 Treated seeds mixed with sand and uniformly spread over the furrows and covered with mixture of soil and manure. 1.5.4 Bed mulched with mulching materials . 1.5.5 Nursery bed thoroughly irrigated without damaging seeds and beds. 1.5.6 Mulching removed when seeds start germinating. 1.5.7 Seeds sown in seed trays/poly bag filled with coco peat and soil-manure mixture alternatively.				
1.6 Irrigate nursery	1.6.1 Irrigation schedule prepared on the basis of soil type, season and water source . 1.6.2 Nursery bed irrigated as per soil moisture content without damaging seedling. 1.6.3 Drainage path prepared and excess water drained from the nursery bed.				
1.7 Perform hardening of seedling	1.7.1 Secondary nursery prepared for vegetable transplanting. 1.7.2 Seedlings with 4/5 leaves uprooted from primary nursery without damaging roots. 1.7.3 Seedlings transplanted maintaining 10cm to 15cm distance between plants.				



	1.7.4 Secondary nursery irrigated without damaging saplings.				
1.8 Protect seedling	1.8.1 Visual inspection performed and recorded. 1.8.2 Weeds, off type and unhealthy saplings removed from nursery bed and disposed as per 3R's principle . 1.8.3 Plant's diseases and harmful insects identified based on signs and symptoms. 1.8.4 Suitable methods applied to control plant's diseases and insects. 1.8.5 Secondary nursery bed covered with shade net/plastic according to season.				

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



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Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Hat • Mask • Apron • Goggles • Gloves • Safety shoe
Materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Seed • Compost • Farm yard manure (FYM) • Chemical fertilizer • Jhol Mal • Plastic tunnel: <ul style="list-style-type: none"> ○ Bamboo strip ○ Plastic ○ Rope
Foreign materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Plant debris • Weed • Pebble



	<ul style="list-style-type: none"> • Stone • Plastic • Metals • Glass
Types of waste	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bio degradable • Non bio degradable
Bed	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Raised bed: 1 m wide, 15 cm raised and length as per requirements • Sunken bed: 1 m wide, 15 cm deep and length as per requirements • Flat bed: 1 m wide and length as per requirements
Mulching materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Straw • Litters • Plastic
Water source	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Well • Tube well • Pond • River • Water harvest



Vegetable	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Cauliflower • Cabbage • Tomato • Broad leaf mustard
3R's principle	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Reduce • Reuse • Recycle
Plant's diseases and harmful insects	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Plant's diseases <ul style="list-style-type: none"> ○ Fungal ○ Bacterial ○ Viral • Harmful insects <ul style="list-style-type: none"> ○ Caterpillar ○ White grubs ○ Aphids ○ Flies • Nematodes
Suitable methods	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Destroy alternative host • Uprooting • Burning



	<ul style="list-style-type: none"> • Hand picking • Trapping • Bio/chemical pesticides
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5	Unit No: 2 Unit Title: Perform vegetable seed 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 Soil samples taken as a slice from 15cm to 20 cm deep V-shaped holes and thoroughly mixed. 2.2.3 Half to one kilogram of 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 levelled. 2.3.3 Manure/fertilizer applied as per vegetable types. 2.3.4 Soil treated as per soil test report. 2.3.5 Plots distance maintained for isolation.
	2.4 Perform seed sowing/transplanting	2.4.1 Seed sowing/seedling transplanting distance marked according to vegetable type. 2.4.2 Seed sown/seedling transplanted at the marked place without damaging seed/roots. 2.4.3 Land mulched around the planted seed/seedling. 2.4.4 Staking provided to plants. 2.4.5 Plots tagged with plant information .
	2.5 Irrigate plot	2.5.1 Irrigation system prepared based on available water source . 2.5.2 Irrigation schedule prepared on the basis of soil type, type of vegetable and season. 2.5.3 Land irrigated uniformly and gently without damaging plants. 2.5.4 Drain system prepared and excess water drained from plot.
	2.6 Perform intercultural operations	2.6.1 Crop field inspected and information recorded. 2.6.2 New seedling replanted on the uprooted place.



		2.6.3 Hoeing and earthing up done without damaging root. 2.6.4 Plots irrigated based on soil moisture level and critical stage of crop growth. 2.6.5 Excess water drained from plots. 2.6.6 Small size, odd shape and damaged fruits thinned out. 2.6.7 Roughing performed and disposed as per 3R's principle .
	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 and irrigated. 2.7.3 Nutrients provided to plants with deficiency symptoms.
	2.8 Perform crops protection	2.8.1 Visual inspection performed and recorded. 2.8.2 Plant's diseases and harmful insects identified based on signs and symptoms. 2.8.3 Suitable methods applied as per plant's diseases and insects. 2.8.4 Dose of bio/chemical pesticide solution prepared based on manufacturer's instruction. 2.8.5 Bio/chemical pesticide applied using appropriate method and time .
	2.9 Perform harvesting	2.9.1 Mature pods, fruits of vegetables identified and harvested without scattering. 2.9.2 Harvested vegetables stored in clean, dry and ventilated room. 2.9.3 Tools and equipment cleaned, maintained, stored and record updated.
6	Task Performance Requirements (Tools, Equipment and Materials): <ul style="list-style-type: none"> Knife, sickle, shovel, drum, PVC pipe, garden pipe, sprayer, spade, hoe, stake, plastic roll, crate, rake, nails, hammer, pesticides, bucket, mug, sprinkler, drip set, watering can, measuring jar, agriculture lime, insect net, agro/shade net, whisk, baskets, <i>thunche</i>, <i>doko</i>, <i>kuto</i>, <i>kodalo</i>, <i>gal/khanti</i>, pick, wheel barrow, covering materials, seeds, seedlings, fertilizer, farm yard manure, mulching materials, marker pen, pen, paper, register, first aid kit and personal protective equipment (PPE). 	
7	Safety and Hygiene (Occupational Health and Safety): <ul style="list-style-type: none"> Use personal protective equipment. Safe handling of materials, tools and equipment. Apply protective measures against chemical fertilizer. 	



	<ul style="list-style-type: none"> • Safe use of pesticides. • Safe handling of debris. • Prevent from cutting hazards
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8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> Tools and equipment: <ul style="list-style-type: none"> Types Uses Safe handling Vegetable seed farming <ul style="list-style-type: none"> Introduction Factor affecting vegetable seed farming Soil sampling technique Land selection, layout and preparation Seed and seedling <ul style="list-style-type: none"> Introduction Variety Quality Seed sowing and seedling transplanting <ul style="list-style-type: none"> Introduction Methods Handling Isolation <ul style="list-style-type: none"> Introduction 		<ul style="list-style-type: none"> Read and interpret manufacturer's instruction



	<ul style="list-style-type: none"> ○ Purpose ○ Isolation distance based on vegetable type ● Irrigation <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Selection of irrigation system ○ Irrigation schedule ○ Source ● Drainage <ul style="list-style-type: none"> ○ Introduction ○ Importance ○ Method ● Intercultural operations <ul style="list-style-type: none"> ○ Weeding ○ Hoeing ○ Thinning ● Roughing <ul style="list-style-type: none"> ○ Introduction ○ Importance ○ Methods ● Manure and fertilizer 		
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	<ul style="list-style-type: none"> ○ Introduction ○ Types ○ Preparation techniques ○ Application techniques ○ Nutrients ● Crop protection <ul style="list-style-type: none"> ○ Introduction ○ Harmful and useful insects ○ Plant disease ○ Safe use of pesticides ● Harvesting <ul style="list-style-type: none"> ○ 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 		
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9	Assessment of Competency						
	Unit: 2 Unit Title: Perform vegetable seed farming						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			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 Soil samples taken as a slice from 15cm to 20 cm deep V-shaped holes and thoroughly mixed. 2.2.3 Half to one kilogram of 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 levelled. 2.3.3 Manure/fertilizer applied as per vegetable types. 2.3.4 Soil treated as per soil test report.					



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	2.3.5	Plots distance maintained for isolation.				
2.4	Perform seed sowing/transplanting	2.4.1 Seed sowing/seedling transplanting distance marked according to vegetable type. 2.4.2 Seed sown/seedling transplanted at the marked place without damaging seed/roots. 2.4.3 Land mulched around the planted seed/seedling. 2.4.4 Staking provided to plants. 2.4.5 Plots tagged with <i>plant information</i> .				
2.5	Irrigate plot	2.5.1 Irrigation system prepared based on available water source . 2.5.2 Irrigation schedule prepared on the basis of soil type, type of vegetable and season. 2.5.3 Land irrigated uniformly and gently without damaging plants. 2.5.4 Drain system prepared and excess water drained from plot.				
2.6	Perform intercultural operations	2.6.1 Crop field inspected and information recorded. 2.6.2 New seedling replanted on the uprooted place. 2.6.3 Hoeing and earthing up done without damaging root. 2.6.4 Plots irrigated based on soil moisture level and critical stage of crop growth. 2.6.5 Excess water drained from plots. 2.6.6 Small size, odd shape and damaged fruits thinned out. 2.6.7 Roughing performed and disposed as per 3R's principle .				
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 and irrigated. 2.7.3 Nutrients provided to plants with deficiency symptoms.				
2.8	Perform crops protection	2.8.1 Visual inspection performed and recorded. 2.8.2 Plant's diseases and harmful insects identified based on signs and symptoms. 2.8.3 Suitable methods applied as per plant's diseases and insects.				



	2.8.4 Dose of bio/chemical pesticide solution prepared based on manufacturer's instruction.				
	2.8.5 Bio/chemical pesticide applied using appropriate method and time .				
2.9 Perform harvesting	2.9.1 Mature pods, fruits of vegetables identified and harvested without scattering.				
	2.9.2 Harvested vegetables stored in clean, dry and ventilated room.				
	2.9.3 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

RP- Role Play

PG –Photographs

VD- Video

CT – Certificates

TS – Testimonials (Reward)

PP – Product Produced

CS – Case Study



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Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Hat • Mask • Apron • Goggles • Gloves • Safety shoes • Safety belts
Required information	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Name and address of farmer • Land location • Date of sampling • Previous crop grown • Test required: soil pH, texture, Nitrogen, Phosphorus, Potassium
Foreign materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Plant debris • Weed • Trash • Pebble • Stone
Types of waste	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bio degradable • Non bio degradable



Plant information	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Crop • Variety • Plantation date
Irrigation system	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Sprinkler • Drip • Canal/channels • Garden pipe
Water sources	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Well • Tube wells • River • Pond • Water harvest
Critical stage	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • After transplanting • After top dressing • After hoeing • During flowering and fruiting
Roughing	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Weeding • Removing unwanted plants • Removing unhealthy plants • Removing off types



3R's principle	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Reduce • Reuse • Recycle
Plant's diseases and harmful insects	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Plant's diseases <ul style="list-style-type: none"> ○ Fungal ○ Bacterial ○ Viral • Harmful insects <ul style="list-style-type: none"> ○ Caterpillar ○ Scales ○ Fruit flies ○ White flies ○ White grubs • Nematodes
Suitable methods	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Destroy alternative host • Uprooting • Burning • Hand picking • Trapping • Bio/chemical pesticides
Appropriate method	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Drenching



	<ul style="list-style-type: none"> • Spraying • Applying
Time	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Avoiding damage to bees during flowering time • Avoiding bright sunshine and strong wind



5	Unit No: 3 Unit Title: Perform vegetable seed processing	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 seed extraction	3.2.1 Healthy harvested vegetable pods and fruits collected. 3.2.2 Extraction method applied as per seed types. 3.2.3 Foreign materials removed from seeds. 3.2.4 Fresh and clean seed sorted.
	3.3 Perform drying	3.3.1 Drying media checked for usability . 3.3.2 Drying media placed under shade or sunny place as per nature of seed. 3.3.3 Seeds spread evenly on drying media. 3.3.4 Seeds raked regularly for uniform drying. 3.3.5 Seeds moisture level/dryness checked.
	3.4 Perform packaging	3.4.1 Sample seed taken as per vegetable type. 3.4.2 Seed placed inside packaging materials and sealed. 3.4.3 Labels placed in packaging materials. 3.4.4 Store checked for usability and different categories of seed kept separately. 3.4.5 Tools and equipment cleaned, maintained, stored and record updated.
6	Task Performance Requirements (Tools, Equipment and Materials): <ul style="list-style-type: none"> Bamboo mat, <i>Mandro</i>, <i>Gundri</i>, <i>Nanglo</i>, <i>doko</i>, <i>thunche</i>, <i>tripal</i>, rake, thresher, marker pen, pen, paper, register, rope, label sticker, packing bag, sack, weighting machine, sealing machine, sealing tape, scissors, needle, thread, knife, basket, plastic sheet, bucket, first aid kit and personal protective equipment (PPE). 	



7	Safety and Hygiene (Occupational Health and Safety): <ul style="list-style-type: none"> • Use personal protective equipment. • Safe handling of materials, tools and equipment. • Safe handling of seed
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8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> Tools and equipment: <ul style="list-style-type: none"> Types Uses Safe handling Seed extraction <ul style="list-style-type: none"> Introduction Methods Seed drying, cleaning and sorting Storage <ul style="list-style-type: none"> Introduction Types Importance Packaging and labelling Marketing Seed contract Truthful label 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 vegetable seed processing						
	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			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.					
3.2 Perform seed extraction		3.2.1 Healthy harvested vegetable pods and fruits collected. 3.2.2 Extraction method applied as per seed types. 3.2.3 Foreign materials removed from seeds. 3.2.4 Fresh and clean seed sorted.					
3.3 Perform drying		3.3.1 Drying media checked for usability . 3.3.2 Drying media placed under shade or sunny place as per nature of seed. 3.3.3 Seeds spread evenly on drying media. 3.3.4 Seeds raked regularly for uniform drying. 3.3.5 Seeds moisture level/dryness checked.					



3.4 Perform packaging	3.4.1 Sample seed taken as per vegetable type.				
	3.4.2 Seed placed inside packaging materials and sealed.				
	3.4.3 Labels placed in packaging materials.				
	3.4.4 Store checked for usability and different categories of seed kept separately.				
	3.4.5 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

RP- Role Play

PG –Photographs

VD- Video

CT – Certificates

TS – Testimonials (Reward)

PP – Product Produced

CS – Case Study



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Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Hat • Mask • Apron • Goggles • Gloves • Safety shoes
Extraction method	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Hand picking • Cutting • Threshing • Fermenting • Curing
Foreign materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Plant debris • Weed • Pebble • Stone • Plastic • Metals • Glass



Drying media	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bamboo mat • <i>Mandro</i> • <i>Gundri</i> • <i>Nanglo</i> • <i>Tripal</i> • Plane surface • Plastic sheet
Usability	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Clean • Dry • Absence of hole • Ventilated • Free of pests
Packaging materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bag: plastic, jute and paper • Sack
Labels	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Crops type • Variety • Place of origin • Production date • Date of packaging • Net weight • Sack/Bag number

