

PRODUCTION OF HERBS AND SPICES IN OPEN ENVIRONMENT

ISCED UNIT CODE: 0812 251 03A

TVETCDACC UNIT CODE: HO/CU/HP/CR/03/3/MA

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Produce Herbs and spices

Duration of Unit: 60 Hours

Unit Description

This unit specifies the competencies required to produce Herbs and Spices in an open environment. It involves propagating herbs and spices seedlings, preparing land for herbs and spices, growing herbs and spices, harvesting herbs and spices, undertaking post-harvest activities and undertaking marketing activities.

***NOTE:** The trainer to choose coriander and any other two in the range. Consider ecological requirements, choice of trainees, market demands. Visit to herbs and spices farm is recommended.*

Summary of Learning Outcomes

SNO	Learning Outcome	Duration
1.	Propagate herbs and spices seedlings	15
2.	Prepare land for growing herbs and spices	10
3.	Grow herbs and spices	10
4.	Harvest herbs and spices	5
5.	Undertake post- harvest activities	10
6.	Undertake marketing activities	10

Learning Outcomes, Content, and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Propagate herbs and spices seedlings	1.1 Procedures for occupational safety and health. 1.2 Market survey on suitable herbs and	<ul style="list-style-type: none">• Observation• Oral assessment

Learning Outcome	Content	Suggested Assessment Methods
	<p>spices</p> <ul style="list-style-type: none"> • Consumer preferences • Maturity period • Ecological requirements • Resistant to pests and diseases. <p>1.3 Planting materials</p> <ul style="list-style-type: none"> • Types • Sources • Preparation <p>1.4 Uses of the herbs and spices</p> <p>1.5 Basic plant anatomy</p> <p>1.6 Classification of herbs and spices</p> <ul style="list-style-type: none"> • Annual • Perennial • Biennial <p>1.7 Tools, equipment, supplies and materials</p> <ul style="list-style-type: none"> • Identification • Sourcing • Use • Maintenance • Storage <p>1.8 Soil and water conservation measures</p> <p>1.9 Soil sterilization</p> <p>1.10 Soil erosion control measures</p> <p>1.11 Types of Nurseries</p> <ul style="list-style-type: none"> • Sunken beds • Raised Beds • Flat beds <p>1.12 Factors to be considered for site selection for nurseries.</p> <p>1.13 Nursery bed preparation</p> <p>1.14 Propagation materials</p> <ul style="list-style-type: none"> • Seeds • Cuttings • Rhizomes • Root Tubers. • Splits 	<ul style="list-style-type: none"> • Portfolio of evidence • Third party report • Written assessment • Project • Practical

Learning Outcome	Content	Suggested Assessment Methods
	1.15 Nursery Management practices <ul style="list-style-type: none"> • Weeding • Mulching • Watering/ Irrigation – Types of irrigation • Shading • Pricking out • Pest and diseases control • Hardening off 1.16 Record keeping 1.17 Waste management practices <ul style="list-style-type: none"> • 3Rs of waste disposal 1.18 Emerging trends- Automated sowing machines	
2. Prepare land for growing herbs and spices	2.1 Procedures for occupational safety and health 2.2 Tools, equipment, supplies and materials <ul style="list-style-type: none"> • Identification • Sourcing • Use • Maintenance • Storage 2.3 Soil testing 2.4 Soil conservation measures <ul style="list-style-type: none"> • Mulching • Contour farming • Planting cover crops • Gabion construction • Terraces 2.5 Land preparation <ul style="list-style-type: none"> • Land Clearing • Primary tillage • Secondary tillage • Tertiary operations 2.6 Soil amendments <ul style="list-style-type: none"> • Manure application • Liming • Gypsum 	<ul style="list-style-type: none"> • Observation • Oral assessment • Portfolio of evidence • Third party report • Written assessment • Practical

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> Fertilizer application 2.7 Seedbed preparation 2.8 Wastes management practices <ul style="list-style-type: none"> 3Rs of waste disposal 	
3. Grow herbs and spices	3.1 Procedures for occupational safety and health 3.2 Tools, equipment, supplies and materials <ul style="list-style-type: none"> Identification Sourcing Use Maintenance Storage 3.3 Planting/transplanting procedure 3.4 Food safety measures 3.5 Field Agronomic practices <ul style="list-style-type: none"> Spacing Watering/ Irrigation Gapping Thinning Mulching Pruning Training Crop rotation Intercropping 3.6 Weeding <ul style="list-style-type: none"> Importance of weeding Methods of weeding. <ul style="list-style-type: none"> Biological method Mechanical method Cultural method Chemical method 3.7 Crop protection <ul style="list-style-type: none"> Types of pests and diseases Methods of controlling pests and diseases Integrated Pest and diseases Management Efficient use of the crop protection 	<ul style="list-style-type: none"> Observation Oral assessment Portfolio of evidence Third party report Written assessment Practical Projects

Learning Outcome	Content	Suggested Assessment Methods
	<p>products</p> <p>3.8 Crop nutrition</p> <ul style="list-style-type: none"> • Types of fertilizers • Method of fertilizer application • Efficient use of fertilizer <p>3.9 Record keeping</p> <p>3.10 Waste management practices</p> <ul style="list-style-type: none"> • 3Rs of waste disposal <p>3.11 Emerging trends</p> <ul style="list-style-type: none"> • Technologies for pests and diseases control 	
4. Harvest herbs and spices	<p>4.1 Procedures for occupational safety and health</p> <p>4.2 Tools, equipment, supplies and materials</p> <ul style="list-style-type: none"> • Identification • Sourcing • Use • Maintenance • Storage <p>4.3 Maturity indices</p> <ul style="list-style-type: none"> • Horticultural maturity • Physiological maturity <p>4.4 Methods of harvesting</p> <ul style="list-style-type: none"> • Pinching • Uprooting • Cutting <p>4.5 Food safety measures</p> <p>4.6 Record keeping</p> <p>4.7 Waste management practices</p> <ul style="list-style-type: none"> • 3Rs of waste disposal <p>4.8 Emerging trends</p> <ul style="list-style-type: none"> • Precision harvesting • Blockchain and traceability 	<ul style="list-style-type: none"> • Observation • Oral assessment • Portfolio of evidence • Third party report • Written assessment • Practical

Learning Outcome	Content	Suggested Assessment Methods
5. Undertake post-harvest activities	5.1 Procedures for occupational safety and health 5.2 Tools, equipment, supplies and materials <ul style="list-style-type: none"> • Identification • Sourcing • Use • Maintenance • Storage 5.3 Post-harvest handling practices <ul style="list-style-type: none"> • Weighing • Cleaning • Sorting • Grading • Packaging • Storage • Waxing 5.4 Food safety measures 5.5 Record keeping 5.6 Waste management practices <ul style="list-style-type: none"> • 3Rs of waste disposal 5.7 Emerging trends- <ul style="list-style-type: none"> • Automated grading • Packaging innovations 	<ul style="list-style-type: none"> • Observation • Oral assessment • Portfolio of evidence • Third party report • Written assessment • Practical
6. Undertake marketing activities	6.1 Market survey techniques 6.2 Channels/medium/mode of marketing produce 6.3 Pricing techniques <ul style="list-style-type: none"> • Customer value-based pricing • Cost – based pricing • Competition based pricing • New- product pricing 6.4 The 4Ps in marketing <ul style="list-style-type: none"> • Product • Place • Price • Promotion 6.5 Record keeping (manual and electronic records)	<ul style="list-style-type: none"> • Observation • Oral assessment • Portfolio of evidence • Third party report • Written assessment

Learning Outcome	Content	Suggested Assessment Methods
	6.6 Wastes management practice 3.9 3Rs of waste disposal 6.7 Emerging trends 3.10e – marketing 6.8 Functional and health boosting products 6.9 Product certification	

Suggested Methods of Instruction

- Instructor-led facilitation
- Demonstration by trainer
- Practical work by trainees
- Group discussions
- Presentations
- Projects
- Case studies
- Problem based learning
- Experiential learning
- Question and answer
- Team training
- Team learning
- E-learning
- Academic trips

Recommended Resources for 25 Trainees

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A	Learning Materials			
1.	GAP guidelines manuals		5 pcs	1:5
2.	MoALF herbs and spices production manual		5 pcs	1:5

3.	KALRO training manuals		5 pcs	1:5
B	Learning Facilities & infrastructure			
1.	Lecture/theory room	40 M ²	1	1:25
2.	Tools and Equipment storage facility		1	1:25
3.	Chemical and fertilizer storage facility		1	1:25
4.	Agricultural Land	One Acre	1	1:25
C	Consumable materials			
1.	Manure	Tonnes of farm yard manure	2	2:25
2.	Fertilizers	Planting 2 top dressing	3 bags of 50kg	3:25
3.	Planting materials	Seeds, seedling, vegetative material	1kg of seeds/acre	1:25
4.	Mulching materials	Organic and inorganic of 30microns	20 bales of organic mulch 4rolls of inorganic mulch	20:25 4:25
5.	Khaki paper bags and stickers	0.5kg bag	4 packets of khaki bag and 200 stickers	4:25
6.	Seedling trays	66 cells tray	50 trays	2:25
7.	Layout string	Sisal twine	2 rolls	2:25
8.	Stationery	Assorted	1 rim of printing papers 1 packet of pens 1packet of maker pens	1:25
9.	Nails	3 inches and 4 inches	2kgs	1:25
10.	Pesticides	Herbicides Insecticides Nematicides Fungicides	1Litre of each	1:25
11.	Rooting hormones	Powder	200grams	1:25

12.	Scouting flags	3 fabric ribbon-Red, yellow, green	75	3:1
13.	Pest control traps	Sticky traps	2	2:1
14.	Personal protective Equipment (PPEs)	Set-(overall, gloves, respirator, gumboot, goggles) Spray suit	25 5	1:1 1:5
15.	Packaging materials	Assorted-3 different packaging materials	1	3:1
D	Tools and Equipment			
1.	Hoes/jembe		25 pcs	1:1
2.	Panga		10 pcs	1:3
3.	Slasher		10 pcs	1:3
4.	Secateurs		15 pcs	1:2
5.	Spade		15 pcs	1:2
6.	Soil auger		5 pcs	1:5
7.	Pegs		100 pcs	4:1
8.	Hammer		15 pcs	1:2
9.	Saw		15 pcs	1:2
10.	Bucket		15 pcs	1:2
11.	Dibbler		15 pcs	1:2
12.	Garden trowel		15 pcs	1:2
13.	Measuring tape		10 pcs	1:3
14.	Knapsacks sprayers		5 pcs	1:5
15.	Irrigation equipment	A complete set of irrigation system	1 set	1:1
16.	Storage tanks	3, 000 litres capacity	1	1:1
17.	Watering can	5litre can-plastic/metallic	5 pcs	1:5