PRODUCTION OF VEGETABLE CROPS IN OPEN ENVIRONMENT

ISCED UNIT CODE: 0812 251 01A

TVETCDACC UNIT CODE: HO/CU/HP/CR/01/3/MA

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Produce Vegetable Crops in open environment

Duration of Unit: 80 Hours

Unit Description

This unit specifies the competencies required to produce vegetable crops. It involves propagating vegetable crop seedlings, preparing land for vegetable crop, growing vegetable crop, harvesting vegetable crop, undertaking post-harvest activities and undertaking marketing activities.

NOTE: The trainer to choose at least one vegetable in each category in the range for propagation. The choice should be based on ecological zone, interest of trainees and market demands.

Summary of Learning Outcomes

SNO	Learning Outcome	Duration (hours)
1.	Propagate vegetable crop seedlings	15
2.	Prepare land for growing vegetable crop	15
3.	Grow vegetable crop	15
4.	Harvest vegetable crop	10
5.	Undertake post-harvest activities	15
6.	Undertake marketing activities	10

Learning Outcomes, Content, and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Propagate vegetable crop seedlings in open environment	1.1 Definition of horticulture 1.2 Types of horticultural crops 1.2.1 Vegetables 1.2.2 Fruits 1.2.3 Herbs and spices 1.2.4 Cut Flowers 1.2.5 Ornamental plants 1.2.6 Mushrooms 1.2.7 Nuts 1.3 Procedures for occupational safety and health. 1.4 Market survey on suitable crop 1.4.1 Consumer preferences 1.4.2 Maturity period 1.4.3 Ecological requirements 1.4.4 Resistant to pests and diseases. 1.4.5 Sources of finances 1.4.6 Vegetable crop business plan 1.5 Planting materials 1.5.1 Types 1.5.2 Sources 1.5.3 Preparation 1.6 Uses of the vegetable crops 1.7 Basic plant anatomy 1.8 Classification of vegetable crops 1.8.1 Leaf vegetables • Kales • Cabbage • Black nightshade (Managu) 1.8.2 Fruit vegetables • Tomatoes • Capsicum • Cucumber	• Observation • Oral assessment • Portfolio of evidence • Third party report • Written assessment • Project • Practical

Learning Outcome	Content	Suggested Assessment Methods
	1.8.3 Root and Tuber • Onions • Carrots • Garlic 1.9 Tools, equipment, supplies and materials 1.9.1 Identification 1.9.2 Sourcing 1.9.3 Use 1.9.4 Maintenance 1.9.5 Storage 1.10 Types of Nurseries 1.10.1 Sunken beds 1.10.2 Raised Beds 1.10.3 Flat beds 1.11 Factors to be considered for site selection for nurseries. • Nursery bed preparation 1.12 Propagating of the planting materials 1.13 Nursery Management practices 1.13.1 Weeding 1.13.2 Mulching 1.13.3 Watering/ Irrigation – Types of irrigation 1.13.4 Shading 1.13.5 Pricking out 1.13.6 Pest and diseases control 1.13.7 Hardening off 1.14 Procedures for occupational safety and health. 1.15 Record Keeping 1.16 Waste management practices • 3Rs of waste disposal	
2. Prepare land for growing	2.1 Procedures for occupational safety and health	• Observation • Oral assessment

Learning Outcome	Content	Suggested Assessment Methods
vegetable crop	2.2 Tools, equipment, supplies and materials 2.1.1 Identification 2.1.2 Sourcing 2.1.3 Use 2.1.4 Maintenance 2.1.5 Storage 2.3 Soil management 2.4 Soil and water conservation measures 2.5 Land preparation 2.5.1 Clearing 2.5.2 Primary tillage 2.5.3 Secondary tillage 2.5.4 Tertiary operations 2.6 Soil amendments • Manure application • Liming • Gypsum • Fertilizer application 2.7 Record keeping 2.8 Wastes management practices	• Portfolio of evidence • Third party report • Written assessment • Practical
3. Grow vegetable crop	3.1 Procedures for occupational safety and health 3.2 Tools, equipment, supplies and materials 3.2.1 Identification 3.2.2 Sourcing 3.2.3 Use 3.2.4 Maintenance 3.2.5 Storage 3.3 Planting/transplanting procedure 3.4 Field agronomic practices 3.4.1 Spacing 3.4.2 Watering/ Irrigation 3.4.3 Gapping 3.4.4 Thinning	• Observation • Oral assessment • Portfolio of evidence • Third party report • Written assessment • Practical • Projects

Learning Outcome	Content	Suggested Assessment Methods
	3.4.5 Mulching 3.4.6 Pruning 3.4.7 Training 3.4.8 Crop rotation 3.4.9 Intercropping 3.5 Weeding 3.5.1 Importance of weeding 3.5.2 Methods of weeding. • Biological method • Mechanical method • Cultural method • Chemical method 3.6 Crop protection 3.6.1 Types of pests and diseases 3.6.2 Methods of controlling pests and diseases 3.6.3 Integrated Pest and diseases Management 3.6.4 Efficient use of crop protection products 3.7 Crop nutrition 3.7.1 Types of fertilizers 3.7.2 Method of fertilizer application 3.7.3 Efficient use of fertilizer 3.8 Food safety measures 3.9 Record keeping 3.10 Wastes management practices 3.10.1 3Rs of waste disposal	
4. Harvest vegetable crop	4.1 Procedures for occupational safety and health 4.2 Tools, equipment, supplies and materials 4.2.1 Identification 4.2.2 Sourcing 4.2.3 Use	• Observation • Oral assessment • Portfolio of evidence • Third party report • Written

Learning Outcome	Content	Suggested Assessment Methods
	4.2.4 Maintenance 4.2.5 Storage 4.3 Maturity indices 4.3.1 Horticultural maturity 4.3.2 Physiological maturity 4.4 Methods of harvesting 4.4.1 Pinching 4.4.2 Uprooting 4.4.3 Cutting 4.5 Food safety measures 4.6 Record keeping 4.7 Wastes management practice 4.7.1 Rs of waste disposal	assessment ● Practical
5. Undertake post-harvest activities	5.1 Procedures for occupational safety and health 5.2 Tools, equipment, supplies and materials 5.2.1 Identification 5.2.2 Sourcing 5.2.3 Use 5.2.4 Maintenance 5.2.5 Storage 5.3 Post-harvest handling practices 5.3.1 Weighing 5.3.2 Cleaning 5.3.3 Sorting 5.3.4 Grading 5.3.5 Packaging 5.3.6 Storage 5.3.7 Waxing 5.4 Food safety measures 5.5 Record keeping 5.6 Wastes management practice 5.6.1 3Rs of waste disposal 5.7 Emerging trends- 5.7.1 Automated grading	● Observation ● Oral assessment ● Portfolio of evidence ● Third party report ● Written assessment ● Practical

Learning Outcome	Content	Suggested Assessment Methods
	5.7.2 Packaging innovations	
6. Undertake marketing activities	6.1 Market survey techniques 6.2 Channels/medium/mode of marketing produce 6.3 Pricing techniques 6.4 Customer value-based pricing 6.4.1 Cost – based pricing 6.4.2 Competition based pricing 6.4.3 New- product pricing 6.4.4 The 4Ps in marketing 6.4.5 Product 6.4.6 Place 6.4.7 Price 6.4.8 Promotion 6.5 Basic value addition 6.6 Record keeping 6.7 Wastes management practice 6.7.1 3Rs of waste disposal 6.8 Emerging trends 6.8.1 e – marketing	• Observation • Oral assessment • Portfolio of evidence • Third party report • Written assessment

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**			
	GAP guidelines manuals		5 pcs	1:5
	MoALF Vegetable production manual		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	Wheelbarrows/tins 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

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
7.	Layout string	Sisal twine	2 rolls	2:25
8.	Twining string	Nylon	5 rolls	5:25
9.	Binding wire	Staking binding wire	50kg	50:25
10.	Stationery	Assorted	1 rim of printing papers 1 packet of pens 1packet of maker pens	1:25
11.	Staking sticks	Wooden sticks 1.5m long	250 sticks	10:1
12.	Nails	3 inches and 4 inches	2kgs	1:25
13.	Pesticides	Herbicides Insecticides Nematicides Fungicides	1Litre of each	1:25
14.	Rooting hormones	Powder	200grams	1:25
15.	Pheromones+traps	2pheromones Tuta absoluta and fruit fly	50 pieces	2:1
16.	Scouting flags	3 fabric ribbon-Red, yellow, green	75	3:1
17.	Pest control traps	Sticky traps	2	2:1
18.	Personal protective Equipment (PPEs)	Set-(overall, gloves, respirator, gumboot, goggles) Spray suit	25 5	1:1 1:5
19.	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 augur		5 pcs	1:5
7.	Pegs		100 pcs	4:1

S/No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
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.	Knapsack's 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