



Republic of Rwanda
Ministry of Education



RTB | RWANDA
TVET BOARD

NURSERY ESTABLISHMENT

AGENE302

Establish a nursery

Competence

RQF Level: 3

Learning Hours



40

Credits: 4

Sector: Agriculture and Food processing

Trade: Agriculture

Module Type: General

Curriculum: AFPAGR3001 - TVET Certificate 3 in Agriculture

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Purpose statement	This module describes the skills, knowledge and attitude required to establish the nursery. It is designed for learners who have successfully completed 9 year’s basic education or its equivalent and pursuing level III in agriculture. At the end of this module, learners will be able to Prepare for nursery establishment operations, carry out plant propagation in nursery and maintain the established nursery. Qualified learners deemed competent may work in various places including Open field, Nursery and greenhouses performing a range of tasks related to crop growing She/he can work alone or with others under supervision					
Learning assumed to be in place	N.A					
Delivery modality	Training delivery		100%	Assessment		Total 100%
	Theoretical content		30%	Formative assessment	30%	50%
	Practical work:		70%		70%	
	• Group project and presentation	20%				
	• Individual project /Work	50%				
			Summative Assessment			50%

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Prepare for nursery establishment operations	1.1. Instructions provided by supervisor are correctly interpreted.
	1.2. Tools and equipment are adequately selected considering nursery activities.
	1.3. Site is appropriately identified according to specific nursery requirements and enterprise plan.
	1.4. Occupational health and safety (OHS) hazards and risks are properly identified referring to food and environmental standards.
	1.5. PPE are well selected according to the desired operation.
	1.6. Environmental implications of nursery are properly identified according to regulations.
2. Carry out plant propagation in nursery	2.1 Site is Properly prepared for nursery establishment
	2.2. Planting materials are effectively treated following species requirements.
	2.3 Substratum is appropriately prepared following requirements of species and media

	availability.
	2.4 Sowing in nursery is appropriately done depending on species and enterprise plan.
	2.5 Records are properly kept as required by the supervisor.
3. Maintain the established nursery	3.1 Cultural practices in nursery are properly performed depending on species.
	3.2 Grafting is properly performed following species requirements and market demand
	3.3 Pest and diseases are effectively controlled following specific measures and standards.
	3.4 Seedlings are appropriately delivered considering standards and customers' requirements.
	3.5 Records are properly kept as required by supervisor

Course content

Learning outcomes	At the end of the module the learner will be able to: 1. Prepare for nursery establishment operations 2. Carry out plant propagation in nursery 3. Maintain the established nursery
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Learning outcome 1: Prepare for nursery establishment operations	Learning hours: 6
Indicative content	
• Interpretation of instructions provided by supervisor. ✓ Instructions • Selection of tools and equipment. ✓ Materials used in nursery operations ✓ Small farm tools and equipment used in nursery activities ✓ Selection criteria of tools and equipment used in nursery activities • Identification of Site ✓ Factors to consider when selecting a site ✓ Nursery type • Identification of Occupational health and safety (OHS) hazards and risks. ✓ Types of hazards associated with nursery establishment ✓ Hazards risks • Selection of PPE. ✓ Categories of PPE used in nursery establishment ✓ PPE Selection criteria • Identify environmental implications of nursery. ✓ Definition of environmental impact ✓ Types Impacts of nursery activities on the environment	
Resources required for the learning outcome	
Equipment	Projector, Computer, Power tiller, Motor sprayer and Dumpy level
Materials	Internet A-frame level, N-frame level, Pegs, Ropes, Related pictures, Water, Field and PPE
Tools	Notebooks, Chalks, Books, Pen, Pencil and Flip chart
Facilitation techniques	Demonstration and simulation, Individual and group work, Practical exercise, Individualized, trainer guided and Group discussion

Formative assessment methods	Written assessment, Oral presentation, and Performance assessment
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Learning outcome 2: Carry out plant propagation in nursery	Learning hours: 18
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Indicative content

- **Prepare the site for nursery establishment**
 - ✓ Site clearing methods
 - ✓ Type of Tillage
 - ✓ Criteria for designing layout
 - ✓ Construction
- **Carry out planting materials treatments.**
 - ✓ Seed preparation
 - ✓ Types of seeds pre-treatments
 - ✓ Selection criteria of plants vegetative propagation parts
 - ✓ Types of vegetative propagation
 - ✓ Treatment of vegetative propagation materials
- **Prepare the substratum.**
 - ✓ Types of media
 - ✓ Media sterilization
- **Sowing in nursery.**
 - ✓ Methods of sowing
 - ✓ Types of seedbeds
 - ✓ Post sowing immediate care
- **Keep records.**
 - ✓ Content of record keeping form
 - ✓ Methods of record keeping



Resources required for the indicative content
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Equipment	Wheelbarrow, Containers, power tiller and motorized sprayers
Materials	Bamboo, Inoculum, Seeds, Water, Chemicals (H ₂ SO ₄), Auxins, Disinfectant, Soil, Cuttings, Seeds, Pencils, measuring tape, Papers, Manure, Sandy soil, Loamy soil, Clay soil, Mycorrhiza soil, Sieve, Wheelbarrow, Spades, Baskets, measuring tape, Seedbed, Pots, Dibber, Stick, Mulch, Record keeping format, Markers, Power tiller, Motor sprayer, trays and containers
Tools	Nails, Rake, Machete, Pots, Knife, Hoe, Rubber, Ruler, Calendar, Ropes, shears, Hammer, Watering can

Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided and Group discussion
Formative assessment methods	Written assessment, Oral presentation, and Product based assessment

Learning outcome 3: Maintain the established nursery		Learning hours: 16
Indicative content		
• Perform cultural practices ✓ Cultural practices in nursery ✓ Fertilizers application • Perform vegetative propagation activities ✓ Grafting ✚ Conditions of success of grafting, Conditions related to the plant, Conditions related to environment, Plant material preparation, Post grafting care. • Management of pests and diseases. ✓ Methods of control ✚ Cultural methods, Chemical methods, Biological, Mechanical/Physical methods • Deliver seedlings considering standards and customers' requirements. ✓ Seedlings quality ✚ Bare roots seedlings, Balled & Bur lapped seedlings, Container seedlings ✓ Handling practices ✓ Precautions • Keep records. ✓ Content of record keeping form ✓ Methods of record keeping		
Resources required for the indicative content		
Equipment	Projectors, Computer, Knapsack sprayer,	
Materials	Flip charts, markers, DVD player, fertilizers, pesticides, measuring tape, Rope, related books, Plot, Seedlings, flip chart, rubber, wrapping materials and Personal	

	protection equipment
Tools	Pest and diseases fact sheets, Markers, Flip charts
Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided and Group discussion
Formative assessment methods	Written assessment, Oral presentation, Performance assessment, Product based assessment and Project based assessment

Integrated situation

Recently, Mr. KANANI, a farmer at KAMONYI District at Nyarubaka Sector decided to invest in the production of seedlings after reading several reports mentioning that there is lack of good quality fruit seedlings in KAMONYI and MUHANGA districts. At the beginning, he targeted to produce 20000 grafted citrus seedlings to supply to farmers and later he would expand his activities in the production of avocado and mango seedlings. However, KANANI is not skilled in nursery operations. Hence, he hired someone to give him a technical assistance in establishing a nursery for production of grafted seedlings. As he is not sure of the ability of that person, he conducted a practical exam to recruit that person. Therefore, as a skilled agricultural worker you are requested to demonstrate him that you should establish a nursery on a 4m² bed (4m long, 1m wide) and produce 200 grafted citrus seedlings to convince him. You must perform this task and later present it in 2 hours.

This integrated situation is an example, however the indicators for evaluating the quality of process were developed to fit any other integrated situation .

1. TVET schools should install demonstration plots, this will allow trainees to demonstrate activities at various stages.
2. Trainees can be evaluated in form of project whereby they carry out growing activities on small piece of land from land preparation.
3. Trainers can design another integration situation adapted to the context.

Resources

Tools	Nails, Bamboo, Rake, Hammer, Ropes, Panga, Hoe, Ruler, measuring tape, Pots, Hoe, Dibber, Stick, Mat, Containers, Bags soil, Sieve, Spades, Baskets, Knife, Measuring tape and PPE
Equipment	wheelbarrow, Knapsack sprayer, watering can, Power tiller, Motor sprayer
Materials/ Consumables	Citrus seeds for rootstock, Manure, Woods, Pencils, Rubber, Papers, Sandy soil, Citrus mother plants, Pots, Loamy soil, Clay soil, Seeds, Water, and chemicals (H ₂ SO ₄) Mulch

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
Learning outcome 1: Prepare for nursery establishment operations (30%)	1.1. Instructions provided by supervisor are Correctly interpreted.	Interpretation of instructions			3
	1.2. Tools and equipment are adequately selected considering nursery activities.	Materials used in nursery operations			3
		Small farm tools and equipment used in			2

		nursery activities			
		Respect the selection criteria of tools and equipment used in nursery activities			2
	1.3. Site is appropriately identified according to specific nursery requirements and enterprise plan.	Factors considered when selecting a site			3
		Types of nurseries			2
	1.4. Occupational health and safety (OHS) hazards and risks are properly identified referring to Food and Environmental standards.	Risks of hazards associated with nursery establishment			3
	1.5. PPE are well selected according to the desired operation.	Categories of PPE			3
		Selection criteria of PPE			3
		Use of PPE			2
	1.6. Environmental implications of nursery are properly identified according to regulations.	Impacts of nursery activities on the environment			4
	Learning outcome 2: Carry out plant propagation in nursery (40%)	2.1. Site is Properly prepared for nursery establishment	Methods of site clearing		2
			Types of tillage		2
			Criteria for designing layout		3
			Nursery structure		4
		2.2. Planting materials are effectively treated following species requirements.	seeds pre-treated		2
			Quality of planting materials		4
		2.3. Substratum is appropriately prepared following requirements of species and media availability.	Quality of media		3
			Quality of Media sterilized		4

	2.4 Planting in nursery is appropriately done depending on species and enterprise plan.	Methods of sowing			3
		Seedbeds prepared			3
		Types of sowing			2
		Post immediate care after planting			3
	2.5 Records are properly kept as required by the supervisor.	Template of record keeping form			4
		Data collected.			4
Learning outcome 3: Maintain the established nursery (30%)	3.1 Cultural practices in nursery are properly performed depending on species.	Cultural practices Performed in nursery			3
	3.2. Grafting is properly performed following species requirements and market demand	Grafted seedlings			4
		Quality of grafted seedling			4
	3.3. Pest and diseases are effectively controlled following specific measures and standards.	Methods of pests and diseases control applied			3
		Evaluation of pests and diseases control			4
	3.4 Seedlings are appropriately delivered considering to standards and customers’ requirements.	Quality of Seedlings delivered			3
		Seedling Handling activities performed			4
		Key Precautions during seedlings delivery			3
	3.5 Records are properly kept as required by supervisor	Template of record keeping form			1
		Data collected			1
Total marks		100			
Percentage Weightage		100%			
Minimum Passing line % (Aggregate): 70%					

Reference books:

1. Yashwantrao Chavan Maharashtra Open University. Horticulture Nursery Management. Indian Council of Agricultural Research, New Delhi – 110012. Resource available online.
2. Perry, L.P., (1998). Herbaceous Perennials Production. A Guide from Propagation to Marketing. University of Vermont Extension System
3. Kolotelo, D., Steenis, E.V., Peterson, M., Bennett, R. and Trotter, D. (2001) Handling Guidebook. British Columbia. Ministry of Forests. Tree Improvement Branch. ISBN 0-7726-4658-9
4. Munjuga, M.R., Gachuri A.N., Ofori DA, Mpanda MM, Muriuki JK, Jamnadass RH, Mowo J.G., (2013). Nursery management, tree propagation and marketing: A training manual for smallholder farmers and nursery operators. Nairobi: World Agroforestry Centre.