



Model Curriculum

QP Name: Banana Farmer cum Primary Processor

QP Code: AGR/Q0301

Version: 3.0

NSQF Level: 3

Model Curriculum Version: 2.0

Agriculture Skill Council of India || Agriculture Skill Council of India (ASCI), 6th Floor, GNG Tower, Plot No. 10, Sector - 44

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Training Parameters

Sector	Agriculture
Sub-Sector	Agriculture Crop production
Occupation	Fruit Crops Cultivation
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/6112.0901
Minimum Educational Qualification and Experience	<p>Minimum Educational Qualification: Grade 10 OR Grade 8 with two years of (NTC/ NAC) after 8th OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2-year relevant experience OR 5th grade pass with 5-year relevant experience OR Previous relevant Qualification of NSQF Level 2 with 1-year relevant experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months' relevant experience</p>
Pre-Requisite License or Training	NA
Minimum Job Entry Age	16 Years
Last Reviewed On	27/01/2022
Next Review Date	27/01/2025
NSQC Approval Date	27/01/2022
QP Version	3.0
Model Curriculum Creation Date	27/01/2022
Model Curriculum Valid Up to Date	27/01/2025
Model Curriculum Version	2.0

Minimum Duration of the Course	300 Hours
Maximum Duration of the Course	300 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills to:

- Describe the process of selecting and preparing the site and planting of banana crop.
- Demonstrate the process of carrying out macro and micronutrient management of banana crop.
- Describe the process of managing weed growth in banana crop.
- Demonstrate the process of performing integrated pest and disease management for the banana crop
- Demonstrate the process of performing irrigation management for the banana crop.
- Demonstrate the process of carrying out harvesting, processing and marketing of banana crop
- Demonstrate the primary processing activities carried out post-harvest
- Explain the basic entrepreneurial activities for small enterprise.
- Demonstrate the process of extraction of fiber from pseudo-stems
- Demonstrate the process of harvesting, processing, storage and marketing of banana fiber
- Describe the process of undertaking employability and entrepreneurial practices.
- Describe the process of engaging in collective farming/activity.
- Demonstrate various practices to maintain personal hygiene, cleanliness, and safety at the workplace.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	05:00	00:00	0:00	0:00	05:00
Module 1: Introduction to the role of a Banana Farmer cum Primary Processor	05:00	0:00	0:00	0:00	05:00
AGR/N0301: Planting material preparation in banana cultivation NOS Version- 1.0 NSQF Level- 4	05:00	20:00	0:00	0:00	25:00
Module 2: Process of preparing planting materials in banana cultivation	05:00	20:00	0:00	0:00	25:00
AGR/N0302: Land preparation and plantation in banana cultivation NOS Version- 2.0	10:00	20:00	0:00	0:00	30:00

NSQF Level- 4					
Module 3: Process of land preparation and plantation in banana cultivation	10:00	20:00	0:00	0:00	30:00
AGR/N0303: Integrated nutrient management in banana cultivation NOS Version-2.0 NSQF Level- 4	10:00	20:00	0:00	0:00	30:00
Module 4: Process of carrying out nutrient management in banana cultivation	10:00	20:00	0:00	0:00	30:00
AGR/N0304: Integrated Pest and disease management in banana cultivation NOS Version-1.0 NSQF Level- 4	10:00	20:00	0:00	0:00	30:00
Module 5: Process of performing integrated pest and disease management for banana Cultivation	10:00	20:00	0:00	0:00	30:00
AGR/N0305: Irrigation management and other operations in banana cultivation NOS Version- 2.0 NSQF Level-4	10:00	20:00	0:00	0:00	30:00
Module 6: Process of performing irrigation management for banana cultivation	10:00	20:00	0:00	0:00	30:00
AGR/N0306: Harvesting and post-harvest management in banana cultivation NOS Version- 2.0 NSQF Level-4	10:00	20:00	0:00	0:00	30:00
Module 7: Process of carrying out harvesting, post-harvest management in banana cultivation	10:00	20:00	0:00	0:00	30:00

AGR/N0357: Carry out banana fiber extraction from banana pseudo stem NOS Version- 1.0 NSQF Level-4	10:00	20:00	0:00	0:00	30:00
Module 8: Process of carrying out banana fiber extraction from banana pseudo stem	10:00	20:00	0:00	0:00	30:00
AGR/N9908 Undertake basic entrepreneurial activities for small Enterprise NOS Version- 2.0 NSQF Level- 4	10:00	20:00	0:00	0:00	30:00
Module 9: Basic entrepreneurial activities for small enterprise	10:00	20:00	0:00	0:00	30:00
AGR/N9903 Maintain health and safety at the workplace NOS Version- 3.0 NSQF Level- 4	10:00	20:00	0:00	0:00	30:00
Module 10: Hygiene and cleanliness	03:00	03:00	0:00	0:00	06:00
Module 11: Safety and emergency procedures	12:00	12:00	0:00	0:00	24:00
DGT/VSQ/N0102 Employability Skills NOS Version-1.0 NSQF Level-4	30:00	00:00	0:00	0:00	30:00
Module 12: Employability Skills	30:00	00:00	0:00	0:00	30:00
Total Duration	120:00	180:00	0:00	0:00	300:00

Module Details

Module 1: Introduction to the role of a Banana Farmer cum Primary Processor

Bridge Module

Terminal Outcomes:

- Discuss the job role of Banana Farmer cum primary processor

Duration: 05:00	Duration: 0:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the size and scope of the agriculture industry and its sub-sectors. • Discuss the role and responsibilities of a Banana Farmer Cum Primary Processor • Identify various employment opportunities for a Banana Farmer Cum Primary Processor 	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Process of preparing planting materials in banana cultivation

Mapped to AGR/N0301 v2.0

Terminal Outcomes:

- Describe the process of procuring the planting material.
- Describe the varieties suitable to the agro-climatic region
- Demonstrate the process of preparing the planting material
- Demonstrate the storage of the planting material till planting

Duration: 10:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the criteria in selecting the site with suitable agro-climatic conditions for banana cultivation • Explain various requirements suitable for growing banana like climate, soil type, soil fertility, nature of subsoil and soil depth • Explain various climatic parameters such as maximum and minimum temperatures, intensity and distribution of precipitation (rainfall), relative humidity etc., • Explain various agro-climatic zones in India suitable for banana cultivation • Describe the risks associated with banana growing and possible precautions that need to be taken • List out various banana varieties and the cultivation duration and their yield • Explain the key considerations in selecting the banana varieties • Explain the significance of disease-resistant and high-yielding varieties of banana • Discuss pest and diseases specific to a given agro climatic region, the life cycles of these pests and diseases and the sources of infection • Explain the uses and harmful effects of various pesticides • Explain relevant legislation, standards, policies, and procedures 	<ul style="list-style-type: none"> • select the banana variety to be cultivated based on the local biotic and abiotic situations, available resources and constraints, market need and prices, production costs and time of harvest • identify appropriate varieties based on the agro-climatic zone • Demonstrate the implementation of measures to make the site suitable for banana growing • Create drainage channels in the field for the effective drainage of water • Create irrigation channels in the field • Show how to maintain the condition of tools and equipment required for seedling and planting material preparation • identify various vendors / suppliers (including government nurseries / department) of the planting material • Estimate the quality of seedling and material from each source in terms of free from pests and diseases, survival rate etc. • Analyse the prevailing market rates for the planting material • Demonstrate the procurement of the planting material from the authorized vendors • Demonstrate the procedure to store the planting material • Analyse the suitability of the variety

<p>in work</p> <ul style="list-style-type: none"> • Explain relevant health and safety requirements applicable in the work environment • Explain importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business • Explain biotic and abiotic stress resistance (in terms of temperature fluctuations, dry spells, heavy downpour during critical stages etc.,) in banana varieties 	<p>to the given soil type</p> <ul style="list-style-type: none"> • Analyse the appropriate pesticides available for planting treatment • Demonstrate the process of treatment of planting material with the pesticide as per dosage recommended by the state agriculture university/department or as prescribed by the manufacturer's guidelines • Demonstrate the safety precautions while handling the pesticide/chemicals • Demonstrate the safety and first aid measures
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Sickle, khurpi, spade, chemicals	

Module 3: Process of land preparation and plantation in banana cultivation

Mapped to ARG/N0302 v2.0

Terminal Outcomes:

- Describe the process of selecting and preparing the site for cultivation of bananas
- Demonstrate the process of planting suckers.
- Demonstrate various practices for effective resource optimisation.
- Demonstrate various waste management practices.
- Discuss ways to promote diversity and inclusion at the workplace.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain relevant legislation, standards, policies, and procedures in work • Explain relevant health and safety requirements applicable in the work environment • Explain the importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business • Explain the concept of mulching and its importance • List out various mulching materials used for growing banana • Distinguish between the plastic mulch and natural mulch • State the appropriate time and no of times ploughing and mulching to be carried • Explain about soil weathering and its importance • Discuss soil types, their advantages and disadvantages in the light of banana cultivation • Explain various methods of land preparation based on the soil type to maintain soil tilth • Explain various farm machinery available and their utility to maintain soil tilth and health • Explain High Density Planting (HDP) 	<ul style="list-style-type: none"> • select generic / specific nematicides to a given agro-climatic zone • Demonstrate the application of nematicides and fumigants • Demonstrate the clearing of existing planting material in the field and burning in eco-friendly manner • Demonstrate the preparation of ditch for wet soil that will carry away all the water as per the recommendation • Demonstrate the making of furrows in the soil length wise and breadth wise • Demonstrate the use of blade harrows for land levelling • Demonstrate the use of rotavator to plough the soil to make it fine as per the recommendations • Demonstrate the demarcation of spacing with the use of sticks • Demonstrate the digging of pits at the intersection of rows and furrows • Demonstrate planting the banana suckers/tissue culture seedlings as per the pit or furrow method • Demonstrate the application of basal dose of fertilisers • Demonstrate dipping of suckers in water in which potassium permanganate is mixed with

<p>in banana</p> <ul style="list-style-type: none"> • Explain the criteria for segregating waste into appropriate categories • Explain how to recycle and dispose different types of waste • Explain the growth cycle of Banana - Vegetative phase and Reproductive phase • Explain about various tools and equipment required for land preparation and planting • Explain the ratoon Management in banana • Discuss methods of pre-treatment of suckers • State appropriate time , system and methods of planting • Explain the concepts of Plant canopy and light intersection • Explain Various cropping system and Intercultural Operations 	<p>recommended dosage</p> <ul style="list-style-type: none"> • Show how to place suckers in the hole • Demonstrate the installation of props to support the uniform development of the plants • Demonstrate various practices to optimise the usage of various resources such as water and electricity
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Plough, Disc Harrow, Sub-Soiler, Tiller, Land Leveller, Cultivator, nematicides, rotavator, pesticides, suckers, potassium permanganate, Chemicals, Sprayer, Weeder, Hoe, Sickle</p>	

Module 4: Process of carrying out nutrient management in banana cultivation

Mapped to AGR/N0303 v2.0

Terminal Outcomes:

- Explain how to determine the macro and micronutrients requirements.
- Demonstrate the process of applying fertilisers to the soil.
- Demonstrate the process of performing soil conservation
- Describe the process of identifying weed growth.
- Demonstrate the process of performing weed management.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the basic concepts of plant nutrition and soil fertility. • Explain different types of macro and micronutrients, their properties and their functions. • List common symptoms of nutrient deficiency in plants. • Explain different types of green manure and nitrogen-fixing crops. • Describe the process of soil sampling and testing. • Explain the importance of getting the soil tested through a government-approved lab. • Explain how to interpret the soil analysis report to determine the macro and micronutrient requirements of the soil. • Explain different soil types, their advantages and disadvantages with reference to the presence of various nutrients. • State the appropriate time and methods for the application of different types of fertilisers. • Explain the importance of regulating the dose of fertiliser according to the crop cycle. • State the recommended dosage and 	<ul style="list-style-type: none"> • Demonstrate the process of preparing organic fertilisers such as farmyard manure, vermicompost and inorganic fertiliser solutions. • Demonstrate the process of preparing the mixture of liquid fertilisers for application in the field, using them in the recommended quantity. • Show how to prepare the field for the application of fertilisers. • Demonstrate various cultural practices that enhances the soil nutrient status for the benefit of banana crop stand • Demonstrate the process of applying organic and inorganic fertilisers containing the required macro and micronutrients to the soil in the recommended dose. • Show how to regulate the dose of fertiliser according to the crop cycle. • Demonstrate the preparation of a sample record of fertilisers used in the field. • Analyse the soil sample report to determine the micro and macronutrients requirements of the soil based on the planned crop variety

<p>application time of fertiliser for different types of crops.</p> <ul style="list-style-type: none"> • Explain the importance of soil conservation and various soil conservation practices. • Explain various varieties of organic and inorganic fertilisers to be applied to the soil to improve its fertility, and nutrient content. • Explain the harmful effects of the over-dosage of fertilizers. • Describe the process of preparing a soil nutrition supplementation calendar based on the stages of the crop's growth. • Explain different types of intercultural and mechanical methods for effective weed control such as trash mulching, solarisation and pasteurisation • Explain relevant legislation, standards, policies, and procedures in work • Explain relevant health and safety requirements applicable in the work environment 	<ul style="list-style-type: none"> • Demonstrate the preparation of a sample soil nutrition supplementation calendar based on the stages of the crop's growth. • Inspect the field, bunds, composting area, and irrigation and drainage channels periodically to identify weed growth • Demonstrate the use of appropriate hand tools and implements to control weed growth
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Sprayer, Fertilisers, Bio Fertilisers, Cloth Bags for Soil Sample, Khurpa, vermicompost</p>	

Module 5: Process of performing integrated pest and disease management for banana Cultivation

Mapped to ARG/N0304 v2.0

Terminal Outcomes:

- Explain the importance of following the relevant preventive measures to control pests and diseases.
- Describe the process of identifying pests and diseases in the banana crop.
- Describe the process of identifying and applying the necessary treatment.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain various types of diseases found in banana and their symptoms. • Explain different biotic and abiotic factors causing diseases and disorders in plants. • Explain different modes of transmission of disease such as implements, vectors, rain, wind. • Explain the importance of adopting safe production methods for safe produce. • Explain the advantages of biological control of insects, pests & diseases, bio-pesticides and pheromones used in IPM (Integrated Pest Management). • State the minimum residue levels and Protected Health Information (PHI) for different types of pesticides. • Explain the use of the pesticide spraying tools and equipment. • Explain the applicable national and international standards on pesticide residues. • Explain the benefits of using pest and disease-resistant varieties of banana • State the recommended practices to be followed to restrict the entry of pathogens into the field through planting material, irrigation water, workers, tools and equipment, and vectors such as whitefly. • Explain the practice of crop rotation with suitable crops. 	<ul style="list-style-type: none"> • Demonstrate the process of removal of the diseased crop to prevent the spread of pests and disease to healthy crop • Demonstrate the use of light and pheromone traps to identify the presence and population of pests, insects and vectors. • Demonstrate the process of applying the recommended treatment as per the prescription to remove pests and diseases. • Demonstrate the use of relevant PPE. • Demonstrate the preparation of a sample record of the use of any pesticides, insecticides and any other treatment. • Identify different types of pests associated (banana weevil, thrips, nematodes, etc) • identify the stage of crop and pest incidence as per the crop calendar • identify the signs and symptoms of damage • identify the pest life cycle and estimate the duration • identify the natural enemies of the pests (naids/dragon flies, trichogramma, mirid bug, lady

<ul style="list-style-type: none"> • Explain the importance of identifying and removing the diseased crop to prevent the spread of pests and disease to the healthy crop. • Explain the use of the recommended combination of biological, mechanical and chemical control methods for effective pest and disease prevention such as traps, sticky plates etc. • Describe the process of determining the stage of pest incidence along with the extent of damage and Economic Threshold Levels (ETL) of the pests. • Explain the use of IPM methods such as light and pheromone traps to identify the presence and population of insects and vectors • Describe the process of determining the causal organism for the disease and its treatment. • List natural enemies of banana pests and explain the benefits of adopting them. • Explain the importance of applying the recommended treatment as per the prescription and maintaining the record of their use. • Explain how to minimize pollution caused by the overuse of pesticides. • List the banned pesticide formulations. • Explain how to deal with chemical poisoning. 	<p>bird beetles, spiders, preying mantidsetc)</p> <ul style="list-style-type: none"> • identify the types of diseases associated (sigathoka, bunchy top, panama wilt, bacterial blight, cercospora leaf sport etc.,) • Demonstrate the IPM practices and techniques • identify the signs and symptoms of different diseases (leaf spots, discoloured areas, leaf margins drying, stunted growth) • Demonstrate the identification and disposal of diseased plants
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Chemicals, Sprayer, Face Mask, Rubber Gloves, Pheromone Traps, Light Traps, Bird Perches, Sticky Traps, PPE	

Module 6: Process of performing irrigation management for banana cultivation

Mapped to NOS AGR/N0305 v2.0

Terminal Outcomes:

- Describe the process of preparing for field irrigation.
- Demonstrate the process of irrigating the field.
- Describe the process of managing water usage.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the timing and method of irrigation appropriate for a given soil type and climatic conditions. • State the quantity of water required for the specific variety and its effect on the yield. • Explain the importance of sampling irrigation water through an authorized lab to determine its quality. • Explain various measures to be followed to improve the water quality. • Describe the process of setting up different types of irrigation systems such as surface irrigation, drip irrigation, sub-surface irrigation system. • Explain the advantages and disadvantages of different types of irrigation systems. • Explain the importance of irrigating the field according to the recommended irrigation schedule for the crop and the factors to consider in scheduling irrigation. • Explain the importance of fertigation • Explain the recommended practices to prevent over and under irrigation. • Explain the recommended practices for effective drainage of excess water from the field. • Explain the importance of 	<ul style="list-style-type: none"> • Demonstrate the process of setting up the appropriate irrigation system such as surface irrigation, drip irrigation, sub-surface irrigation system based on the requirement of the specific field crop. • Demonstrate the process of irrigating the field according to the recommended irrigation schedule for the crop. • Prepare a sample record of field irrigation to ensure irrigation as per the schedule. • Demonstrate how to plug water spills and leakages to prevent its wastage. • Demonstrate the process of pruning and removal of dry leave, water shoots as per requirement and procedures • Demonstrate how to maintain the micro irrigation system • Demonstrate the use of methods of precision farming (drip irrigation), if any • Demonstrate the process of fertigation

<p>maintaining the recommended level of water in the soil to prevent the harmful effects of inappropriate levels of moisture in it.</p> <ul style="list-style-type: none"> • Explain the importance of growing tall plants along the farm border or stacking of plants by wooden stick tide or bamboo poles to protect the plantation from strong winds • Explain various practices for optimized use of water and prevent its wastage. 	
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Fertilizers, drip irrigation equipment, khurpi, sickle,</p>	

Module 7: Process of carrying out harvesting, post-harvest management in banana cultivation

Mapped to AGR/N0306 v2.0

Terminal Outcomes:

- Demonstrate the process of harvesting the bananas.
- Demonstrate how to process and pack the bananas
- Describe the process of managing the inventory and market the produce.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the ideal climate and conditions for harvesting banana • Explain about the maturity indices of banana to ensure its readiness for being harvested. • Explain precautions to be taken while handling the fruits during harvest • Describe the manual and mechanical methods for harvesting banana and the use of relevant tools and equipment. • Explain the signs of biological infestation in banana and the importance of segregating the infested and damaged bananas • Explain the relevant parameters to sort out the harvested banana such as quality, colour, size, appearance, etc. • State the appropriate packing material for packing of bananas such as jute bags, • Polypropylene (PP) pouches, High-Density Polyethylene (HDPE) packaging, etc. • Explain the importance and ways of protecting the produce from damage and contamination. • State the appropriate temperature and humidity for storing the bananas. • Explain the basic inventory 	<ul style="list-style-type: none"> • Demonstrate the process of harvesting the bananas using necessary tools, equipment and machinery. • Demonstrate the process of sorting the harvested bananas on the applicable parameters such as quality, colour, size and appearance. • Show how to pack the bananas following the relevant packaging standards and label the packs with the necessary information as per the applicable regulatory requirements. • Show how to weigh the packed bananas to ensure correct weight in the packs and seal them. • Demonstrate the process of applying the recommended treatment in the storage area to remove pests and rodents and store the packed bananas. • Demonstrate how to process the payment using an e-payment method. • Show how to calculate the benefit-cost (B:C) ratio. • Prepare a sample manual and/ or electronic record of the sales and payments. • Demonstrate controlled atmosphere storage conditions • Assess the loading capacity of the transport vehicle

<p>management practices.</p> <ul style="list-style-type: none"> • Describe the process of identifying and negotiating with potential buyers. • State the appropriate mode of transport for transporting a variety of bananas • Explain various opportunities for production of values added products for better profitability 	
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>Sickle, Harvester, Thresher, Sprayer, Fumigants, Storage Bags, Bag Sealing Machine/ Tools, Weighing Machine, Polypropylene (PP) pouches</p>	

Module 8: Process of carrying out banana fiber extraction from banana pseudo stem

Mapped to AGR/N0357 v2.0

Terminal Outcomes:

- Demonstrate the process of banana fiber extraction
- Demonstrate the latest technologies in banana extraction
- Describe the process of quality pulp extraction
- Describe the storage of the pulp
- Describe the marketing aspects of the extracted pulp

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the characteristics of the banana pseudo-stem fiber, such as morphological, physical and mechanical, durability, degradability, thermal, chemical, and antibacterial properties • Explain the maturity indices of the pseudo-stems suitable for fiber extraction • Discuss about the varieties suitable for fiber extraction and its characteristics • Explain the process of production and extraction of banana pseudo-stem fiber • Explain the importance of retting and degumming of the fiber • Explain the ways to use biomass obtained post-harvest of banana • Explain the functioning of decorticator machine • Explain the tuxing process and its importance • Explain the importance of aerobic or anaerobic microorganisms by the action of fungi or bacteria in the retting process • Explain the importance of hydrogen 	<ul style="list-style-type: none"> • Demonstrate the Process of production and extraction of banana pseudo-stem fiber • Demonstrate the procedure for harvesting of pseudo stem using the relevant tools and implements, ensuring minimum damage during harvesting • Identify the appropriate varieties suitable for fiber extraction • Demonstrate the Process of retting and degumming of the fiber • Demonstrate the use of decorticator machine • Demonstrate the use of chemicals for retting, scraping and gumming process for quality outcome • Demonstrate the process of quality pulp extraction • Demonstrate the latest technologies used in Banana fiber extraction • Demonstrate the procedure for washing of fibers with water for neutralizing • Demonstrate the process of fiber bleaching with dilute hydrogen peroxide or hypochlorite • Demonstrate the process of oiling of

<p>peroxide or hypochlorite in the bleaching process of fiber</p> <ul style="list-style-type: none"> • Explain the pest and diseases specific to a given agro climatic region, that may affect the quality of pseudo stem and there after the fiber quality • Explain potential use and applications of banana pseudo-stem fiber viz. to fabricate rope, place mats, paper cardboard, string thread, tea bags, high-quality textile materials, absorbent, polymer/fiber composites, baby pampers, textiles, and papers such as banknotes etc. 	<p>fiber with a sulfonated hydrocarbon after washing</p> <ul style="list-style-type: none"> • Demonstrate the procedure for storage of fiber pulp in recommended storage area • Identify the various organizations or entrepreneur involved in making of value-added products from banana pseudo-stem fiber for collaboration opportunities • Identify the market and buyers of the pseudo-stem fiber such as e-trading platforms, cooperatives, local traders, exporters, etc. • Analyse the information related to the wholesale and retail price of the pseudostem fiber • Demonstrate the negotiation process with the potential buyers to secure a profitable price for the produce • calculate the benefit-cost (B:C) ratio of fibre extraction • Show how to maintain manual and electronic records using the physical registers and relevant computer application
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>hydrogen peroxide, hypochlorite, sulfonated hydrocarbon, decorticator, sickle, chemicals, storage bags/containers, mask, gloves, PPE</p>	

Module 9: Basic entrepreneurial activities for small enterprise

Mapped to AGR/N9908 v2.0

- Describe the process of planning the agricultural enterprise/ business.
- Describe the process of managing the agricultural production process.
- Describe the process of managing the post-production and marketing processes.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain how to analyse the demand and supply of the relevant agricultural produce in the market • Describe the process of identifying the target customers and assess their needs and expectations with respect to the quality and price of the produce. • Explain how to identify various types of agricultural entrepreneurship/ business opportunities. • Explain how to prepare a basic business plan for agricultural entrepreneurship/business activities. • State the appropriate sources of funding for the agricultural entrepreneurship/ businesses • State the relevant government schemes and programs • Explain the importance of ensuring compliance with the government structural reforms and • framework, along with the applicable rules and regulations. • List various resources required for agricultural production • Describe the process of planning agricultural production and the use of relevant technologies to enhance production • Explain the importance of ensuring no cause adverse impact on the environment and produce during production • State the recommended practices to be followed for efficient input 	<ul style="list-style-type: none"> • Demonstrate how to analyse the demand and supply of the relevant agricultural produce in the market. • Prepare a sample basic business plan for agricultural entrepreneurship/business activities. • Demonstrate how to calculate the costs incurred and determine the price of the product for profitability. • Prepare a sample marketing plan considering the 4Ps i.e., product, price, promotion, and place and 4As i.e., acceptability, affordability, accessibility, and awareness. • Demonstrate the process of using the relevant digital services such as e-commerce, e-payments, electronic recordkeeping, etc.

resource management.

- Describe the process of optimising the production processes and output through the amalgamation of existing practices with smart technologies.
- Explain the recommended sustainability practices to be followed during agricultural production to prevent and deal with deforestation, loss of biodiversity, soil degradation, etc.
- Explain how to collect information related to the wholesale and retail price of agricultural produce.
- Explain how to calculate the economics of the produce viz. production cost, price of the produce, B:C Ratio etc.
- Explain the relevant government schemes with the provision of subsidies/funds for the promotion of agricultural produce.
- Describe the process of selecting appropriate marketing channels for marketing agricultural produce, and the applicable requirements and constraints.
- List the relevant buyers of different types of agricultural produce.
- Explain how to identify and manage various risks to production and post-production processes.
- Explain how to undertake outreach programs to promote agricultural products and services, and expand agri-business.
- Explain the 4Ps i.e., product, price, promotion, and place and 4As i.e., acceptability, affordability, accessibility, and awareness considered while preparing and executing a marketing plan.
- Explain the use of the relevant digital services such as e-commerce, e-payments, electronic recordkeeping,

<p>etc.</p> <ul style="list-style-type: none"> • Explain the importance of using efficient post-production logistics. • Explain the importance of maintaining various records accurately. 	
<p>Classroom Aids</p>	
<p>Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>NA</p>	

Module 10: Hygiene and cleanliness

Mapped to NOS AGR/N9903 v3.0

Terminal Outcomes:

- Discuss how to adhere to personal hygiene practices.
- Demonstrate ways to ensure cleanliness around the workplace.

Duration: 03:00	Duration: 03:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the requirements of personal health, hygiene and fitness at work. • Describe common health-related guidelines laid down by the organizations/ Government at the workplace. • Explain the importance of good housekeeping at the workplace. • Explain the importance of informing the designated authority on personal health issues related to injuries and infectious diseases. 	<ul style="list-style-type: none"> • Demonstrate personal hygiene practices to be followed at the workplace. • Demonstrate the correct way of washing hands using soap and water, and alcohol-based hand rubs. • Demonstrate the steps to follow to put on and take off a mask safely. • Show how to sanitize and disinfect one's work area regularly. • Demonstrate adherence to the workplace sanitization norms. • Show how to ensure the cleanliness of the work area.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Personal Protective Equipment, Cleaning Equipment and Materials, Sanitizer, Soap, Mask	

Module 11: Safety and emergency procedures

Mapped to NOS AGR/N9903 v3.0

Terminal Outcomes:

- Describe how to adhere to safety guidelines.
- Show how to administer appropriate emergency procedures.

Duration: 12:00	Duration: 12:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the Personal Protective Equipment (PPE) required at the workplace. • Describe the commonly reported hazards at the workplace. • Describe the hazards caused due to chemicals/ pesticides/ fumigants. • Describe the basic safety checks to be done before the operation of any equipment/ machinery. • Describe the common first aid procedures to be followed in case of emergencies. • State measures that can be taken to prevent accidents and damage s at the workplace. • Explain the importance of reporting details of first aid administered, to the reporting officer/ doctor, in accordance with workplace procedures. • State common health and safety guidelines to be followed at the workplace. 	<ul style="list-style-type: none"> • Check various areas of the workplace for leakages, water-logging, pests, fire, etc. • Demonstrate how to safely use the PPE and implements it as applicable to the workplace. • Display the correct way of donning, doffing and discarding PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Sanitize the tools, equipment and machinery properly. • Demonstrate the safe disposal of waste. • Demonstrate procedures for dealing with accidents, fires and emergencies. • Demonstrate emergency procedures to the given workplace requirements. • Demonstrate the use of emergency equipment in accordance with manufacturers' specifications and workplace requirements. • Demonstrate the administration of first aid. • Prepare a list of relevant hotline/ emergency numbers.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator's Guide, Participant's Handbook.	
Tools, Equipment and Other Requirements	
Personal Protective Equipment, First Aid Kit, Equipment used in Medical Emergencies.	

Module 12: Employability Skills (60 hours)

Mapped to NOS DGT/VSQ/N0102 v1.0

Duration: 60:00

Key Learning Outcomes

Introduction to Employability Skills Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e-mail using basic English

Career Development & Goal Setting Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service Duration: 5 Hours

30. Describe the significance of analysing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

Annexure

Trainer Requirements

Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
10th class		5	Agriculture Crop Production	0		Banana Farmer with 5 Years' experience with 10th Pass. Experience certificate issued by BDO/Agriculture Officer/Head of Gram panchayat/Loan disbursing bank or financial institution on official letter Head
12th Class		4	Agriculture Crop Production	0		Ex-Service-Man including Ex-Paramilitary personnel: Minimum Qualification is 10+2 with an Honourable Discharge/Pension. SSC would consider a relaxation/waiver of sector specific experience on case to case basis.
Diploma	Agriculture/Horticulture	3	Agriculture Crop Production	0		
Graduate	Graduate in any stream except Agriculture / Horticulture/ Forestry	2	Agriculture Crop Production	0		For school Program minimum qualification of Trainer should be Graduate in botany/agriculture. Their Teaching experience will be considered industry experience
Graduate	Agriculture / Horticulture/ Forestry	0		0		

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role “ Banana Farmer cum Primary Processor ”, mapped to QP: “AGR/Q0301, v2.0”, Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: “Trainer (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2601, v2.0”. The minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
B.Sc	Agriculture/ Horticulture/ Plantation/ Forestry/Botany and related streams	5	Experience in production practices & processing of Banana/horticultural crops and other related experience	0		Practical skills and knowledge required in various tasks of banana cultivation
M.Sc	Agriculture / Horticulture/ Plantation and related streams	2	Experience in production practices & processing of Banana/horticultural crops and other related experience	0		Practical skills and knowledge required in various tasks of banana cultivation
PhD	Agriculture / Horticulture/ Plantation and related streams	1	Experience in production practices & processing of Banana/horticultural crops and other related experience	0		Practical skills and knowledge required in various tasks of banana cultivation

Assessor Certification

Domain Certification	Platform Certification
Certified for Job Role “ Banana Farmer cum Primary Processor ”, mapped to QP: “AGR/Q0301, v2.0”, Minimum accepted score is 80%	Certified for the Job Role: “Assessor (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, v2.0”, with a minimum score of 80%.

Assessment Strategy

Assessment System Overview

In Agriculture Sector it is of ultimate importance that individuals dealing with crop production or livestock have the requisite knowledge and competencies to undertake the task. Based on the Assessment Criteria, SSC in association with empaneled AAs, define the test structure for the given job roles to cover the required skills and competencies. Assessment strategy consists of the following:

1. Multiple Choice Questions: To assess basic knowledge (Objective/Subjective)
2. Viva: To assess awareness on processes (Oral and/or written questioning)
3. Practical: To evaluate skills and identify competencies. (Observation)

Assessments for knowledge and awareness on processes may be conducted through 'real-time' internet-based evaluation or by conducting the same 'offline' through TABs. Skills and competencies are to be assessed by conducting 'practical' on the ground through qualified and ToA certified assessors.

An individual must have adequate knowledge and skills to perform a specific task, weightage for different aspects of the assessment is given as follows:

- Multiple Choice Questions: 20%-30%, depending on the specific QP
- Viva: 20%
- Practical: 50% - 60% (Involves demonstrations of applications and presentations of procedures/tasks and other components)
- Assessment will be carried out by certified assessors through empaneled assessment partners. Based on the results of the assessment; ASCI will certify the learners/candidates

Testing Environment

Assessments are conducted on laptops, Mobiles and android tablets via both offline and online mode depending on the internet connectivity at the assessment location.

In remote locations/villages, assessments get delivered through tablets without the requirement of the Internet.

- Multilingual assessments (ASCI is conducting the assessments in 13 + languages pan India)
- Rubric driven assessments in Practical/Viva sections and responses recorded accordingly
- All responses, data, records and feedback are stored digitally on the cloud
- Advanced auto-proctoring features – photographs, time-stamp, geographic-tagging, toggle- screen/copy-paste disabled, etc.
- Android-based monitoring system
- End to end process from allocation of a batch to final result upload, there is no manual intervention

- Assessment will normally be fixed for a day after the end date of the training / within 7 days of completion of training.
- Assessment will be conducted at the training venue
- The room where assessment is conducted will be set with proper seating arrangements with enough space to curb copying or other unethical activities
- Question bank of theory and practice will be prepared by ASCI /assessment agency and approved ASCI. Only from approved Question Bank assessment agency will prepare the question paper. Theory testing will include multiple-choice questions, pictorial questions, etc. which will test the trainee on his theoretical knowledge of the subject.
- The theory, practical and viva assessments will be carried out on the same day. In case of a greater number of candidates, the number of assessors and venue facilitation be increased and facilitated

Assessment			
Assessment Type	Formative or Summative	Strategies	Examples
Theory	Summative	MCQ/Written exam	Knowledge of facts related to the job role and functions. Understanding of principles and concepts related to the job role and functions
Practical	Summative	Structured tasks/Demonstration	Practical application /Demonstration /Application tasks
Viva	Summative	Questioning and Probing	Mock interviews on the usability of job roles/advantages /importance of adherence to procedures. Viva will be used to gauge trainee's confidence and correct knowledge in handling the job situation

The question paper is pre-loaded in the computer /Tablet and it will be in the language as requested by the training partner.

Assessment Quality Assurance framework

Assessment Framework and Design:

Based on the Assessment Criteria, SSC in association with AAs will define the test structure for the given roles to cover the required skills and competencies. ASCI offer a bouquet of tools for multi-dimensional evaluation of candidates covering language, cognitive skills, behavioural traits and domain knowledge.

Theoretical Knowledge - Item constructs and types are determined by a theoretical understanding of the testing objectives and published research about the item types and constructs that have shown statistical validity towards measuring the construct. Test item types that have been reported to be coachable are not included. Based on these, items are developed by domain experts. They are provided with comprehensive guidelines of the testing objectives of each question and other quality measures.

Type – Questions based on Knowledge Required, Case-based practical scenario questions and automated simulation-based questions.

Practical Skills - The practical assessments are developed taking into consideration two aspects: what practical tasks is the candidate expected to perform on the job and what aspects of the job cannot be judged through theoretical assessments. The candidates shall be asked to perform either an entire task or a set of subtasks depending on the nature of the job role

Type – Standardized rubrics for evaluation against a set of tasks in a demo/practical task

Viva Voce - Those practical tasks which cannot be performed due to time or resource constraints are evaluated through the viva mode. Practical tasks are backed up with Viva for thorough assessment and complete evaluation

Type – Procedural questions, dos and don'ts, subjective questions to check the understanding of practical tasks.

The assessor has to go through an orientation program organized by the Assessment Agency. The training would give an overview to the assessors on the overall framework of QP evaluation. The assessor shall be given a NOS and PC level overview of each QP as applicable. The overall structure of assessment and objectivity of the marking scheme will be explained to them. The giving of marks will be driven by an objective framework that will maintain the standardization of the marking scheme.

Type of Evidence and Evidence Gathering Protocol:

During the assessment the evidence collected by AAs and ASCI are:

- Geo Tagging to track ongoing assessment
- AA's coordinator emails the list of documents and evidence (photos and videos) to the assessor one day before the assessment. The list is mentioned below:
 - Signed Attendance sheet
 - Assessor feedback sheet

- Candidate feedback sheet
 - Assessment checklist for assessor
 - Candidate Aadhar/ID card verification
 - Pictures of the classroom, labs to check the availability of adequate equipment's and tools to conduct the training and assessment
 - Pictures and videos of Assessment, training feedback and infrastructure.
- Apart from the Assessor, a Technical assistant is popularly known as Proctor also ensures the proper documentation and they verify each other's tasks.
 - To validate their work on the day of the assessment, regular calls and video calls are done.
 - On-boarding and training of the assessor and proctor are done on a timely basis to ensure that the quality of the assessment should be maintained.
 - Training covers the understanding of QP, NSQF level, NOS and assessment structure

Methods of Validation

- Morning Check (Pre-Assessment): Backend team of AA calls and confirms assessor/technical SPOC event status. Assessor/Technical SPOC are instructed to reach the centre on time by 9:30 AM / as decided with TC and delay should be highlighted to the Training Partner in advance.
- Video Calls: Random video calls are made to the technical SPOC/assessor so as to keep a check on assessment quality and ensure assessment is carried out in a fair and transparent manner
- Aadhar verification of candidates
- Evening Check (Post Assessment): Calls are made to the ground team to ensure the event is over by what time and the documentation is done properly or not.
- TP Calling: To keep a check on malpractices, an independent audit team calls the TP on a recorded line to take confirmation if there was any malpractice activity observed in the assessment on part of the AA/SSC team. If calls are not connected, an email is sent to TP SPOC for taking their confirmation
- Video and Picture Evidence: Backend team collects video and pictures for assessment on a real-time basis and highlights any issue such as students sitting idle/ trainer helping the candidates during the assessment.
- Surprise Visit: Time to time SSC/AA Audit team can visit the assessment location and conduct a surprise audit for the assessment carried out by the ground team.
- Geo Tagging: On the day of the assessment, each technical SPOC is required to login into our internal app which is Geotagged. Any deviation with the centre address needs to be highlighted to the assessment team on a real-time basis.

Method for assessment documentation, archiving, and Access:

- ASCI have a fully automated result generation process in association with multiple AAs
- Theory, Practical and Viva marks form the basis of the results and encrypted files generated to avoid data manipulation. All responses were captured and stored in the

System with Time-Stamps at the end of AAs and SSC. NOS-wise and PC-wise scores can be generated.

- Maker Checker concept: One person prepares the results and another audit result which is internally approved by AA at first and then gets vetted at the end of SSC
- All softcopies of documents are received from the on-ground tech team over email. The same is downloaded by our internal backend team and saved in Repository. The repository consists of scheme-wise folders. These scheme-wise folders have two job role-specific folders. These specific folders have Year wise and Month wise folders where all documents are saved in Batch specific folders. All Hard copies are filed and stored in the storeroom.

Result Review & Recheck Mechanism –

- Time-stamped assessment logs
- Answer/Endorsement sheets for each candidate
- Attendance Sheet
- Feedback Forms: Assessor feedback form, Candidate feedback form, TP feedback form
- The results for each of the candidates shall be stored and available for review (retained for 5 years/ till the conclusion of the project or scheme)

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	The key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on-site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on-site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	The terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
AGR	Agriculture
DSR	Direct Seeded Rice
ETL	Economic Threshold Levels
HDPE	High-Density Polyethylene
IPM	Integrated Pest Management
NOS	National Occupational Standard (s)
NSQF	National Skills Qualifications Framework
OJT	On-the-job Training
PP	Polypropylene
PHI	Protected Health Information
PwD	People with Disability
PPE	Personal Protective Equipment
QP	Qualifications Pack
SRI	System of Rice Intensification