

Model Curriculum

Mango Grower

SECTOR: AGRICULTURE & ALLIED
SUB-SECTOR: AGRICULTURE CROP PRODUCTION
OCCUPATION: HORTICULTURE- FRUIT CROP CULTIVATION
REF ID: AGR/Q0302, V1.0
NSQF LEVEL: 4



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

AGRICULTURE SKILL COUNCIL OF INDIA

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/Qualification Pack: **'Mango Grower'** OP No. **'AGR/Oo302 NSQF Level 4'**

Date of Issuance: March 15th, 2015

Valid up to: March 31st, 2016

* Valid up to the next review date of the Qualification Pack


S. S. Arora
Authorised Signatory
(Agriculture Skill Council of India)

Mango Grower

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “Mango Grower”, in the “Agriculture & Allied” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	Mango Grower		
Qualification Pack Name & Reference ID. ID	AGR/Q0302, v1.0		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	No entry barrier, 5 th standard pass preferable		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Select the Crop variety: Analyse the Geographical conditions, resources available, select the crop variety, high yielding variety, pest and disease tolerant variety, hybrid varieties • Grow and manage crop: Inputs requirement, Preparation of field, sowing, soil testing, application of fertilizer & nutrients, quality management, crop management • Maintain the quality of the produce: Time of Harvesting, Moisture level of the produce, post harvest practice, packing and transportation. • Become well versed with Environment Health & Safety: Well versed with health and safety measures in terms of personal safety and others as well. 		

This course encompasses 10 out of 10 National Occupational Standards (NOS) of “Mango Grower” Qualification Pack issued by “Agriculture Skill Council of India”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	Introduction Theory Duration (hh:mm) 5:00 Practical Duration (hh:mm) 5:00 Corresponding NOS Code	<ul style="list-style-type: none"> Understand the General Discipline in the class room (Do's & Don'ts) Understand the Role of a Mango Grower Study the different varieties and hybrids of Mango Understand and study the Scopes and Opportunities of Horticulture Crops cultivation 	White Board, Marker, Laptop, projector
2	Prepare planting material for Mango Cultivation Theory Duration (hh:mm) 10:00 Practical Duration (hh:mm) 12:00 Corresponding NOS Code AGR/No310	<ul style="list-style-type: none"> Identify, Select and use the tools and equipments for the plant material preparation Understand the Vegetative propagation Prepare the stock and scion Understand the method of cutting the stock and scion Understand the importance of grafting, budding Practice the Grafting, budding Consult the Agriculture Universities for Planting material Procure the planting material Select the Mother plant for vegetative propagation Understand and select the insect pest tolerant variety as a mother plant 	White Board, Marker, Laptop, projector, budding knife, grafting knife, dormant scions, Tying material such as grafting tape, adhesive tape, electrician's ber tape or rubber strips
3	Prepare land and do planting for Mango cultivation Theory Duration (hh:mm) 11:00 Practical Duration (hh:mm) 17:00 Corresponding NOS Code AGR/ No311	<ul style="list-style-type: none"> Plan the Layout for Mango Plantation Level the land as per the requirement Understand the crop spacing required for Mango plantation Understand the Pre-planting activities Perform planting Understand the soil moisture level required for the plant Practice the mulching and watering 	Marker, Laptop, projector, land leveler, digger, spade, mulching materials
4	Manage Post plantation nursing in Mango Cultivation	<ul style="list-style-type: none"> Understand the Post plantation management Understand the importance of pruning 	Marker, Laptop, projector, pruning shears

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Theory Duration (hh:mm) 4:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code AGR/No312	<ul style="list-style-type: none"> Understand the right time for pruning Understand the different canopy formations for plants Practice the pruning of Mango Plantations Maintain the canopy in appropriate formations 	
5	Nutrient Management in Fruit Crops Theory Duration (hh:mm) 9:00 Practical Duration (hh:mm) 11:00 Corresponding NOS Code AGR/No307	<ul style="list-style-type: none"> Understand the Nutrient requirement for the cultivation of Mango fruit Understand and perform the soil sampling for test Understand the Micro and Macro Nutrients in soil Understand the required fertilizer dosage for the nutrient enrichment in soil Understand the method of nitrogen fixation in soil Understand the various soil microorganisms beneficial for the nutrient enrichment in soil Use the bio fertilizer/organic manure in the cultivation of fruit crop Estimate the quantity of fertilizer to be applied at various stages in relation to NPK and other secondary nutrients. It Maintain the record of application of fertilizers and intervals 	White Board, Marker, Laptop, projector, Sprayer, fertilizers, bio fertilizers,
6	Integrated Pest and Disease Management for Fruit Crops Theory Duration (hh:mm) 9:00 Practical Duration (hh:mm) 11:00 Corresponding NOS Code AGR/No308	<ul style="list-style-type: none"> Understand the major pests and disease in Mango Understand the Characters of different insect pests Understand the symptoms of and precaution measures for different diseases Follow the Package of Practice for the Mango Cultivation Understand the suitable chemical for the insect pest and diseases attack Identify, select and place the different insect traps in the field Understand the importance of Integrated Pest and Disease Management Perform the Integrated Pest and Disease Management 	White Board, Marker, Laptop, projector, traps, chemicals, mask, sprayer, gloves
7	Irrigation Management for Fruit Crops	<ul style="list-style-type: none"> Understand the Water requirement for the cultivation of fruit crop Plan for the Irrigation system 	White Board, Marker, Laptop, projector, irrigation

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Theory Duration (hh:mm) 9:00 Practical Duration (hh:mm) 11:00 Corresponding NOS Code AGR/No309	<ul style="list-style-type: none"> Understand the importance of fertigation and perform as and when required Understand the root spreading of the Mango Plant Understand the soil texture, porosity etc Understand the importance of and perform the water drainage in the field Understand the effects of water clogging in the field Understand the required optimum moisture level in the field for Mango Fruit cultivation Prepare Irrigation Schedule Perform the Irrigation Management 	equipments,
8	Manage Harvest and post-harvest in Mango Cultivation Theory Duration (hh:mm) 10:00 Practical Duration (hh:mm) 10:00 Corresponding NOS Code AGR/No313	<ul style="list-style-type: none"> Do's and don'ts during crop harvesting Harvesting of the crop: Crop maturity, moisture content during harvesting, Size of the fruit, colour, time of harvesting etc Understand and practice the proper method of harvesting and handling of fruits Understand about the physical admixture during harvesting and post harvesting process Understand the chemical properties of the Mango fruit Understand the normal shelf life of the Mango fruit Understand the importance of Post harvest Management Perform the pre cooling technique for the harvested Mango fruit crops Perform the Grading of harvested Mango fruits Identify and use the tools/equipments required for the packing of fruits Practice the packing of the fruits Understand the different storage pest Make arrangements for the Transportation of the packed fruits 	White Board, Marker, Laptop, projector, pre cooling chamber, packing materials, dividers,
9	Basic farm management Theory Duration (hh:mm) 4:00 Practical Duration (hh:mm) 4:00	<ul style="list-style-type: none"> Estimate the cost of production of Mango Plantation Estimate the required investment Practice Farm management- Soil testing, selection of crop variety, Crop Calendar, Crop rotation, intercrops, schedule for fertilizer, pesticide/chemical application, irrigation schedule, harvesting schedule etc Identify the near market area and keep 	White Board, Marker, Laptop, projector, record keeping book,

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code AGR/N9901	update on the market prices <ul style="list-style-type: none"> Keep record on the investment and expenditures 	
10	Assimilating market information Theory Duration (hh:mm) 4:00 Practical Duration (hh:mm) 4:00 Corresponding NOS Code AGR/N9902	<ul style="list-style-type: none"> Understand the suitable market platform for Mango crops Collect the Market information from the reliable sources Understand the right time, place for the market of the produce Analyse the market information 	White Board, Marker, Laptop, projector,
11	Maintain Health & Safety at the work place Theory Duration (hh:mm) 5:00 Practical Duration (hh:mm) 5:00 Corresponding NOS Code AGR/N9903	<ul style="list-style-type: none"> Perform General safety Rules Gain Knowledge of various health hazards relevant to workplace and basic first aid training. Understand the basic safety checks and other common reported hazards before all farm operation Understand, identify and study the use of equipment, processing machine and materials safely and correctly Understand and handle the emergency situation in workplace and during any farm operation 	White Board, Marker, Laptop, projector, Nose masks, first aid kit,
	Total Duration: Theory Duration (hh:mm) 80:00 Practical Duration (hh:mm) 100:00	Unique Equipment Required: White Board, Marker, Laptop, projector, Record Keeping Book, chemicals, budding knife, grafting knife, dormant scions, Tying material such as grafting tape, adhesive tape, electrician's ber tape or rubber strips, land leveler, digger, spade, mulching materials, pruning shears, chemicals, traps, sprayer, mask, gloves, irrigation equipments, pre cooling chamber, packing materials, dividers	

Grand Total Course Duration: **180 Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Agriculture Skill Council of India](#))

Trainer Prerequisites for Job role : "Mango Grower" mapped to Qualification Pack: "AGR/Q0302, v1.0"

Sr. No.	Area	Details
1	Description	Trainer is responsible for providing the education and skills development training on Mango plantation from preparation of planting material to harvesting (includes procuring seed material, preparing nursery, cultivation and intercultural operations, harvesting, marketing, etc)
2	Personal Attributes	Trainer should be Subject Matter Specialist. He/ She should have good communication and observation skill, leadership skill, practical oriented skill
3	Minimum Educational Qualifications	Diploma, Bachelor Degree in Agriculture Science
4a	Domain Certification	Certified for Job Role: <u>"Mango Grower"</u> mapped to QP: <u>"AGR/Q0302, v1.0"</u> . Minimum accepted score is 80%.
4b	Platform Certification	Certified for the Job Role: "Trainer", mapped to the Qualification Pack: "SSC/Q1402". Minimum accepted score is 70%
5	Experience	<ul style="list-style-type: none"> • Post graduate with an experience of 1 Year, • Graduate with experience of 3 + Years, • Diploma with relevant experience of 5+ Years.

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Mango Grower
Qualification Pack	AGR/Q0302, v1.0
Sector Skill Council	Agriculture

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 70% in aggregate
6	The marks are allocated PC wise; however, every NOS will carry a weight age in the total marks allocated to the specific QP

Assessable Outcome	Assessment Criteria	Total Marks	Out Of	Marks Allocation	
				Theory	Skills Practical
1. AGR/N0310 Prepare planting material for Mango cultivation	PC1. identify the agro-climatic zone in which cultivation is taken up	60	2	1	1
	PC2. list the varieties that are suitable to the zone		5	2	3
	PC3. select economically attractive variety		5	2	3
	PC4. prepare the appropriate planting material through practices suitable to variety like grafting, budding, inarching, etc.		5	2	3
	PC5. use vegetative propagation to get true to type planting material		5	3	2
	PC6. treat planting material appropriately		3	2	1
	PC7. store planting material hygienically		3	2	1
	PC8. ascertain the right storage time for planting material based on the practice adopted		2	1	1
	PC9. identify various vendors / suppliers (including government nurseries / Universities) of the planting material , if the farmer is not preparing the planting material		2	1	1
	PC10. ascertain the quality of seedling and planting material from each source in terms of 'free from pests and diseases', 'survival rate' etc.		2	1	1
	PC11. ascertain the prevailing market price for the planting material		2	1	1
	PC12. procure the planting material		2	1	1
	PC13. identify an appropriate storage space (free of infestation and having congenial		2	1	1

	climatic conditions for the planting material				
	PC14. store the planting material (if there is time lag between procurement and planting)		2	1	1
	PC15. ascertain the prevalent pests and diseases of mango in a given agro-climatic zone		2	1	1
	PC16. ascertain the appropriate pesticides and fungicides available for Planting material treatment		4	2	2
	PC17. treat the planting materials per the dosage recommended by the State Agriculture University / Department or as prescribed by the pesticide Manufacturer		4	2	2
	PC18. read the safety precautions in the label/instruction that comes with the pesticide		2	1	1
	PC19. keep ready all the necessary first aids as suggested in the safety measures		2	1	1
	PC20. use all the necessary safety material and follow all the preventive measures		2	1	1
	PC21. to avoid any injury during use / application of pesticide		2	1	1
	Total		60	30	30
2. AGR/No311 Prepare land and plant in Mango cultivation	PC1. level the land appropriately for cultivation	60	6	3	3
	PC2. create proper drainage systems		6	3	3
	PC3. select the appropriate field layout (square system, rectangle system, triangle system, quincunxial system, contour system) based on the variety, yield expected and canopy arrangement		5	3	2

	PC4. place markers at the site at appropriate distances		5	2	3
	PC5. create pits at appropriate depths		2	1	1
	PC6. irrigate the pits at right amounts and allow dryness		4	2	2
	PC7. place grafts/planting material carefully in pits dug		4	2	2
	PC8. ascertain the number of grafts and the distances for planting		6	4	2
	PC9. water grafts and appropriately stake the same		6	0	6
	PC10. protect the graft from effects like heat with construction of shed, etc.		4	2	2
	PC11. apply mulch to conserve soil moisture		6	4	2
	PC12. select and sow intercrops which are appropriate to the chosen mango variety planted		6	4	2
	Total		60	30	30
3- AGR/No312 Manage post plantation nursing in Mango cultivation	PC1. engage in formative pruning in early stages of the plant in appropriate locations and time for the plant	90	15	6	9
	PC2. practice heading back pruning for the mango plant at the appropriate stage of growth of plant		15	9	6
	PC3. prune at the correct location in plant		10	5	5
	PC4. prune following the accepted method		10	5	5
	PC5. dress the locations after pruning with appropriate chemicals		10	5	5
	PC6. maintain the land clean after the pruning		5	3	2

	PC7. maintain the canopy in appropriate formations – open center, ladder, conventional, dwarfing – depending on the land layout, variety and yield		10	5	5
	PC8. peg the heavier branches with poles to ensure the right canopy formation		10	5	5
	PC9. ensure that post canopy management there is sufficient sunlight at the base of the mango tree		5	2	3
	Total		90	45	45
4. AGR/No307 Nutrient management in fruit crops	PC1. understand the basic macro & micro nutrients with their functions	60	15	7	8
	PC2. test soil to determine its nutrient and fertilizer needs from authorized laboratory		10	5	5
	PC3. collect soil testing report		5	3	2
	PC4. select appropriate organic fertilizer including farm yard manure for its application		10	5	5
	PC5. apply fertilizer at various stages of plant cycle		10	5	5
	PC6. application of micro nutrients based on soil testing report		10	5	5
	Total		60	30	30
5. AGR/No308 Integrated insect, pest and disease management for fruit crops	PC1. understand the common pest in fruit cultivation	90	5	2	3
	PC2. identify the various pests in the specific fruit crop such as flower and leaf webber, citrus black fly, mealy bugs, etc		5	2	3
	PC3. identify the stage of crop when the pests attack		4	2	2
	PC4. identify the location on the crop where the pests will attack		4	2	2

PC5. identify and document the pest behaviour	3	2	1
PC6. document the preventive measures for the pests	3	1	2
PC7. adopt direct pest control methods	5	3	2
PC8. adopt promotion of natural enemies to the various pests that can control the same naturally	5	2	3
PC9. prepare a pest calendar with all pest characteristics for fruit crop in relation to different stages of growth	3	2	1
PC10. identify the specific disease in the specific fruit crop like powdery mildew, root stock-end rot, powdery mildew, scooty mould etc	4	2	2
PC11. identify the stage of crop when it is vulnerable to disease	5	2	3
PC12. identify the location on the crop where the disease will occur	5	3	2
PC13. identify the signs and symptoms for the diseases	6	3	3
PC14. identify the mode of disease transfer	5	3	2
PC15. ascertain the appropriate pest management techniques such as pheromone traps, light traps, bird perches, sticky traps	8	4	4
PC16. use appropriate chemicals in right quantities	8	4	4
PC17. use of pest and disease resistant varieties	4	2	2
PC18. use preventive techniques like water logging, destruction of infected plant debris, pruning, etc	8	4	4

			90	45	45
6. AGR/No309 Irrigation management for fruit crops	Total				
	PC1. identify characteristics of good irrigation systems	60	5	3	2
	PC2. ascertain the right amount of water required in the flowering and post flowering phase, germination and maturity phase		5	2	3
	PC3. ascertain the number of days of irrigation required for fruit crop based on the crop stage		8	4	4
	PC4. prepare irrigation schedule by understanding water requirement of the plant and its holding capacity		4	2	2
	PC5. interact with micro irrigation expert on their purpose, usage and advantages		4	2	2
	PC6. incorporate applicable micro irrigation techniques such drip irrigation using appropriate equipments		4	2	2
	PC7. interact with micro irrigation expert for irrigation practices for specific crop		6	3	3
	PC8. ensure water supply to the crop at various life cycles (from sowing to entire life cycle)		6	3	3
	PC9. ensure spread of water in the root zone		6	3	3
	PC10. ensure proper water drainage at all stages		6	3	3
PC11. identify disease due (root rot) to increase in moisture/water content	6		3	3	
	Total		60	30	30
7. AGR/No313 Manage	PC1. calculate the number of days from the flowering to be have an estimate on the ripening day	90	15	8	7

harvest and post-harvest in Mango cultivation	PC2. ascertain the right indicators when the mango is ready for harvesting by checking the colour, bloom on the surface, the flattening in the fruit, roundness, etc		10	5	5
	PC3. encourage natural ripening process		5	2	3
	PC4. harvest the crop at the right time		10	5	5
	PC5. use of fruit harvesters, wherever applicable		10	5	5
	PC6. keep the harvested mangoes away from heat and moisture		4	2	2
	PC7. transport the harvested mangoes to the storage site		4	2	2
	PC8. use wooden or cardboard boxes / plastic crates / bamboo baskets / gunny bags or any other material as per the market requirement and demand and for handling in an efficient and effective manner		12	6	6
	PC9. choose means for transportation, say by trucks/lorries / rail wagons for distant markets based on the requirement and cost dynamics involved.		10	5	5
	PC10. decide on storage or sale based on the prevailing market rates across the markets and the cost of storage		10	5	5
		Total		90	45
8. AGR/ N9901 Basic farm management	PC1. choose the crop based on agro-climatic condition of the region	30	2	1	1
	PC2. take sample of the soil for testing		1	0	1
	PC3. perform intercropping with suitable and recommended crops (as per the main crop cultivated)		2	1	1

PC4. perform crop rotation with suitable crops	2	1	1
PC5. interact with agriculture / extension expert for crop planning	1	1	0
PC6. choose crop based on the economic advantage	2	1	1
PC7. maintain crop production activity record	1	1	0
PC8. maintain crop calendars	1	1	0
PC9. maintain calendars of weed	1	1	0
PC10. maintain insect and pest calendar	2	1	1
PC11. ascertain total cost of production (land, production practices, labour, equipment , fuel, administrative cost etc.)	2	1	1
PC12. maintain records of investment and expenditure	2	1	1
PC13. maintain necessary books of accounts	2	1	1
PC14. identify government schemes and their eligibility for availing themselves of the same	2	1	1
PC15. identify the nearest market	2	1	1
PC16. identify local traders, mandis in the villages and nearby and compare the rates	2	1	1
PC17. identify market rates of the produce season wise	2	1	1
PC18. arrange cost-effective transportation of produce to the market	1	0	1

	Total		30	16	14
9. AGR/N9902 Assimilating market information	PC1. understand the different sources of information at village-level through other farmers, neighbours, relatives, agricultural extension workers, agriculture specialists, concerned government and private departments like gram panchayat, co-operative societies and SHGs etc.	30	1	1	0
	PC2. identify different sources of information at market level through commission agents, mandi samitis and input dealers		1	1	0
	PC3. identify different sources of information through media sources like radio, newspapers, television, magazine internet, SMS in mobile phones etc.		1	0	1
	PC4. identify the appropriate sources of specific market information and proper ways to collect the required information		1	0	1
	PC5. identify the reliable source of information		1	0	1
	PC6. ascertain methods of collecting information through personal visit, telephone, internet and published reports, magazines and articles, workshops, attending seminars and training by agriculture extension service providers		2	1	1
	PC7. ascertain periodicity and cost of assessing market information		2	1	1
	PC8. ascertain availability and non-availability of specific market information		1	0	1
	PC9. perform documentation for analyzing market information		1	0	1
	PC10. evaluate the authenticity of information received		2	1	1

	PC11. analyze the information for taking decision		2	1	1
	PC12. utilize market information for taking cost effective production decisions		2	1	1
	PC13. understand quality-wise and variety-wise prices of different products such as seeds, pest, fertilizer, etc		2	1	1
	PC14. use market information and decide on crop and area to be sown which could result in better productivity for the season		2	1	1
	PC15. utilize market information for taking effective pre-harvesting decisions like seed preparation, land preparation, nutrition management, weed management, pest and diseases management and irrigation management		2	1	1
	PC16. utilize market information for appropriate post-harvesting decision like drying, grading, bagging, transportation, processing and storage		2	1	1
	PC17. decide on marketing parameters like where to sell, when to sell, to whom to sell and what quantity to sell etc. which leads to profit		2	1	1
	PC18. understand benefits derived from market information		1	0	1
	PC19. make projections/future price movements through information sources		1	1	0
	PC20. understand price fluctuations in markets and take appropriate decision		1	1	0
	Total		30	14	16
10. AGR/N9903 Health and safety at the workplace	PC1. undertake basic safety checks before operation of all machinery and vehicles and hazards are reported to the	30	2	1	1

	appropriate supervisor			
	PC2. work for which protective clothing or equipment is required is identified and the appropriate protective clothing or equipment is used in performing these duties in accordance with workplace policy.	2	1	1
	PC3. read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants etc	2	1	1
	PC4. assess risks prior to performing manual handling jobs, and work according to currently recommended safe practice.	2	1	1
	PC5. use equipment and materials safely and correctly and return the same to designated storage when not in use	2	1	1
	PC6. dispose of waste safely and correctly in a designated area	2	1	1
	PC7. recognize risks to bystanders and take action to reduce risk associated with jobs in the workplace	3	2	1
	PC8. Perform your work in a manner which minimizes environmental damage all procedures and work instructions for controlling risk are followed closely.	2	1	1
	PC9. Report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger.	1	0	1
	PC10. Follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to emergency.	2	1	1
	PC11. follow emergency procedures to company standard / workplace	2	1	1

	requirements				
	PC12. use emergency equipment in accordance with manufacturers' specifications and workplace requirements		2	1	1
	PC13. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques		2	1	1
	PC14. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate		2	1	1
	PC15. report details of first aid administered in accordance with workplace procedures.		2	1	1
			30	15	15
	TOTAL	600	600	300	300
	<u>Percentage Weightage:</u>			50%	50%
	<u>Minimum Pass% to qualify (aggregate):</u>			60%	