

Model Curriculum

Greenhouse Operator

SECTOR: AGRICULTURE & ALLIED
SUB-SECTOR: AGRICULTURE CROP PRODUCTION
OCCUPATION: PRECISION FARMING
REF ID: AGR/Q1003, V1.0
NSQF LEVEL: 3



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: **'Greenhouse Operator'** QP No. **'AGR/Q1003 NSQF Level 3'**

Date of Issuance: August 15th, 2016
Valid up to: March 31st, 2018

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



Authorised Signatory
(Agriculture Skill Council of India)

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Greenhouse Operator

CURRICULUM / SYLLABUS

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

Program Name	Greenhouse Operator		
Qualification Pack Name & Reference ID. ID	AGR/Q1003, v1.0		
Version No.	1.0	Version Update Date	
Pre-requisites to Training	5 th Standard Appeared or Passed		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Identify/familiarize with different components of greenhouse: Understand the working of different components of greenhouse • Maintain the required environment of greenhouse: temperature, humidity, light on daily basis as per the crop requirement • Undertake various greenhouse operations: preparing growth media, planting, weeding, irrigation, harvesting etc • Care and maintenance: monitor the plants regularly for their healthy growth • Document various operations: ensure proper labelling & document the details as required by the organization • Practice health & safety at the work place: Well versed with health and safety measures in terms of personal as well as others’ safety. 		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “Greenhouse Operator” Qualification Pack issued by “Agriculture Skill Council of India”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	Introduction Theory Duration (hh:mm) 05:00 Practical Duration (hh:mm) 00:00 Corresponding NOS Code Bridge Module	<ul style="list-style-type: none"> Understand General Discipline in the class room (Do’s & Don’ts) Study the Scope & importance of Greenhouse in India Different crops that can be grown in greenhouse Understand the Role of a Greenhouse Operator 	Laptop, white board, marker, projector
2	Operate & maintain various greenhouse components Theory Duration (hh:mm) 25:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code AGR / N1007	<ul style="list-style-type: none"> Understand various greenhouse components Familiarize with the working of different greenhouse components Operate & maintain various greenhouse equipments Familiarize with Sprinklers, Foggers & Misters Ensure maintenance of proper environment in greenhouse as per the crop requirement 	Laptop, white board, marker, projector, Audio-visual aids, Drawing Sheet, Chart Paper, Pencil, Eraser, Colour Marker, ventilating fans and air circulation tubes, carbon dioxide units, shade cloth, special lighting designed to stimulate plant growth, cooling pads and other devices to maintain, control and monitor temperature, moisture and carbon dioxide levels in greenhouses; Germination equipment, including heating mats and plant containers; Greenhouse equipments including identification tags and plant markers; Heavy duty electrical generators used exclusively for emergency back-up

Sr. No.	Module	Key Learning Outcomes	Equipment Required
			power supply for the greenhouse; Spraying equipment for the application of insecticides, herbicides, fungicides and fertilizers; Watering equipment including sprinkler systems, pumps, distribution lines, hoses, nozzles, fertilizer injectors and propagation misters
3	Manage greenhouse operations Theory Duration (hh:mm) 30:00 Practical Duration (hh:mm) 40:00 Corresponding NOS Code AGR/N1008	<ul style="list-style-type: none"> • Understand the crop growth requirements • Prepare different growing media for plants • Undertake planting, weeding etc • Undertake irrigation/ fertigation • Undertake various control measures for insects, rodents, pest, diseases & nutritional deficiencies prevention • Harvest/ grade the crop as per the organization's requirement • Monitor the plant growth regularly and register anomalies & actions undertaken • Maintain greenhouse register 	Laptop, white board, marker, projector, Audio-visual aids, Benches, tables and plant carts used in the production area; Containers (including flats and pots) for plants; Greenhouse equipments including identification tags and plant markers; Spraying equipment for the application of insecticides, herbicides, fungicides and fertilizers; Watering equipment including sprinkler systems, pumps, distribution lines, hoses, nozzles, fertilizer injectors and propagation misters, Sickle, hoe, khurpa, spade, hand trowel, cocopeat; compost/ vermicompost
4	Maintain Health & Safety at the work place Theory Duration	<ul style="list-style-type: none"> • Maintain a clean & efficient workplace • Render appropriate emergency procedures • On Time Reporting to appropriate person. 	Laptop, white board, marker, projector, safety shoes, first aid box,

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 15:00 Practical Duration (hh:mm) 15:00 Corresponding NOS Code AGR/N9903	<ul style="list-style-type: none"> Practice General safety and first aid 	fire extinguisher
5	Soft Skills/ Computer Literacy/ Financial Literacy Theory Duration (hh:mm) 15:00 Practical Duration (hh:mm) 15:00 Corresponding NOS Code	<ul style="list-style-type: none"> Basic Communication Skills Basic Computer Skills Various types of documents and their uses- Birth certificate, 10th Certificate, Ration Card, Voter Id Card, Aadhar Card, PAN card, Driving License, Bank Pass Book Various types of loan/credit available (relevant to the trainees' requirement) and the process to avail the same 	Computer, Audio-visual aids, Projector
	Total Duration: Theory Duration (hh:mm) 90:00 Practical Duration (hh:mm) 110:00	Unique Equipment Required: Laptop, white board, marker, projector, Audio-visual aids, Benches, tables and plant carts used in the production area; Containers (including flats and pots) for plants, Furnaces, ventilating fans and air circulation tubes, carbon dioxide units, shade cloth, special lighting designed to stimulate plant growth, cooling pads and other devices to maintain, control and monitor temperature, moisture and carbon dioxide levels in greenhouses; Germination equipment, including heating mats and plant containers; Greenhouse equipments including identification tags and plant markers; Heavy duty electrical generators used exclusively for emergency back-up power supply for the greenhouse; Spraying equipment for the application of insecticides, herbicides, fungicides and fertilizers; Watering equipment including sprinkler systems, pumps, water tanks, distribution lines, hoses, nozzles, fertilizer injectors and propagation misters, safety shoes, goggles, fire extinguisher, first aid box, Sickle, hoe, khurpa, spade, hand trowel, cocopeat; compost/vermicompost	

Grand Total Course Duration: **200 Hours, 0 Minutes**

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

Trainer Prerequisites for Job role: "Greenhouse Operator" mapped to Qualification Pack: "AGR/Q1003, v1.0"

Sr. No.	Area	Details
1	Description	Trainer is responsible for educating the trainees – Different components of greenhouse & their working, Maintenance of greenhouse environment as per the crop requirement, Undertaking various greenhouse operations
2	Personal Attributes	Trainer should be Subject Matter Expert. He/ she should have good communication, leadership, observation and practical oriented skills.
3	Minimum Educational Qualifications	Bachelor's Degree, Preferably in Agriculture/Horticulture
4a	Domain Certification	Certified for Job Role: "Greenhouse Operator" mapped to QP: "AGR/Q1003, v1.0". Minimum accepted score is 80%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "SSC/Q1402". Minimum accepted % as per respective SSC guidelines is 70%.
5	Experience	<ul style="list-style-type: none"> • M.Sc (Horticulture) with 1 Year experience • B.Sc.(Horticulture) with 3 Years experience • Any Graduate with 5+ years experience in relevant field • Any +2 having 7/8 Years of experience in Greenhouse operations

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Greenhouse Operator
Qualification Pack	AGR/Q1003, 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 50% 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 (200)	Out Of	Marks Allocation	
				Theory	Skills Practical
1. AGR/N1007 Operate & maintain various greenhouse components	PC1. understand various components of greenhouse: galvanized structure, covering, cooling system, exhaust fan, heating system, motorized shading net/ thermal net, fogging/sprinkler system, drip system, control panel, motorized ventilation		5	3	2
	PC2. get familiarized with the working of different components of greenhouse		5	3	2
	PC3. ensure personal hygiene by using of gloves, masks, goggles, boots, etc. whenever required		5	2	3
	PC4. check all tools and equipments before operating them		5	3	2
	PC5. perform all procedures and follow work instructions for controlling operational risks		5	2	3
	PC6. ensure the entire system is shut-off before leaving in the evening		2	1	1
	PC7. take care to avoid water logging in greenhouse		5	3	2
	PC8. check the level of water in the tanks daily		5	3	2
	PC9. maintain temperature, humidity, light on daily basis as per the crop requirement		5	2	3
	PC10. maintain the temperature with the help of cooling pad and fan as per the crop and season		5	3	2
	PC11. maintain humidity by the operation of foggers as per the crop & season		5	2	3
	PC12. ensure proper ventilation through exhaust fan/ motorized ventilation		5	2	3
	PC13. position and regulate greenhouse irrigation systems to water plants		5	2	3
	PC14. set up irrigation systems in soil-less growing media		5	3	2
	PC15. maintain boilers, furnaces, electrical systems and fans		5	2	3
	PC16. operate & maintain various greenhouse equipments like water treatment machines, carbon dioxide generators and ultraviolet sterilizers etc		8	2	6
	PC17. clean & place all the tools & equipments at the designated places after use		5	3	2
			85	41	44

2. AGR/N1008 Manage greenhouse operations	PC1. receive planting material	5	2	3
	PC2. understand the type and quantity of plants to grow or stock (for example, cut or potted flowers, bedding plants, vegetables, plant varieties)	5	4	1
	PC3. determine the environmental conditions required to grow the selected plants and set planting and care schedules accordingly	5	3	2
	PC4. prepare soil or soil-less peat mix growing medium for planting	5	2	3
	PC5. plant bulbs, seeds and cuttings, graft plants, transplant seedlings and rooted cuttings grade-wise	10	4	6
	PC6. label each batch of plantlets indicating plant species/ variety, date of transplanting etc	5	2	3
	PC7. train and prune plants	5	2	3
	PC8. apply irrigation and schedule fertigation according to the crop requirement	5	2	3
	PC9. identify and control problems caused by insects, rodents, plant diseases or nutritional deficiencies	5	2	3
	PC10. remove weeds & off types, spray plants with pesticides and apply fertilizers	5	2	3
	PC11. ensure safe handling, use, storage and disposal of pesticides	5	2	3
	PC12. harvest/grade the crop as per the standards/ supervisor's instructions	10	4	6
	PC13. record the details of plantlets received & transplanted- plant species/ variety, Accession Number of clone/genotype, batch of production, no of plant lets, date of transplanting etc in the greenhouse register	5	2	3
	PC14. monitor the plantlets regularly for their growth and presence of any infestation/infection/off types	5	2	3
	PC15. remove the off types & dead plantlets promptly to avoid attack by saprophytic fungi and record the plantlet mortalities in green house register	5	2	3
	PC16. carry out vector monitoring at periodic intervals and record the same in the specified manner	5	2	3

	PC17. record any kind of treatment given to the plants such as application of fertilizers or micro-nutrients sprays or application of pesticides indicating date/time of application, fertiliser or other chemicals applied, dosage rate and if pesticides applied (including botanicals and microbial pesticides), pest against which applied and name/sign of applicator.		5	2	3
	PC18. maintain the greenhouse register		5	2	3
			100	43	57
3. AGR/Ngg03 Maintain Health and safety at the workplace	PC1. undertake basic safety checks before operation of all machinery and vehicles and hazards are reported to the appropriate supervisor	15	1	0	2
	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.		1	1	0
	PC3. read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants etc		1	1	0
	PC4. assess risks prior to performing manual handling jobs, and work according to currently recommended safe practice.		1	0	1
	PC5. use equipment and materials safely and correctly and return the same to designated storage when not in use		1	0	1
	PC6. dispose of waste safely and correctly in a designated area		1	0	1
	PC7. recognise risks to bystanders and take action to reduce risk associated with jobs in the workplace		1	1	0
	PC8. perform your work in a manner which minimizes environmental damage all procedures and work instructions for controlling risk are followed closely.		1	0	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.		1	1	0
	PC11. follow emergency procedures to company standard / workplace requirements		1	1	0
	PC12. use emergency equipment in accordance with manufacturers' specifications and workplace requirements		1	0	1

	PC13. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques		1	0	1
	PC14. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate		1	0	1
	PC15. report details of first aid administered in accordance with workplace procedures.		1	1	0
			15	6	9
Total		200	200	90	110
Percentage Weightage:				45%	55%
Minimum Pass% to qualify (aggregate):			50%		