Model Curriculum

Seed Processing Plant Technician

SECTOR: AGRICULTURE & ALLIED
SUB-SECTOR: AGRICULTURE INDUSTRIES
OCCUPATION: SEED PRODUCTION AND PROCESSING
REF ID: AGR/Q7104, 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: '**Seed Processing Plant Technician**' QP No. '**AGR/ Q7104 NSQF Level 4**'

Date of Issuance: January 20th, 2016

Valid up to: March 31st, 2019

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

Authorised Signatory
(Agriculture Skill Council of India)

TABLE OF CONTENTS

Seed Processing Plant Technician

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Seed Processing Plant Technician", in the "Agriculture & Allied" Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	**Seed Processing Plant Technician**		
Qualification Pack Name & Reference ID. ID	AGR/Q7104, v1.0		
Version No.	1.0	**Version Update Date**	
Pre-requisites to Training	Class 8, preferably		
Training Outcomes	**After completing this programme, participants will be able to:** • **Familiarise with various steps involved in seed processing-** Understand the quality of raw seed and adopt proper processing steps to obtain good quality seed. • **Understand basic principles of seed processing-**Seed size, shape, weight colour viz a viz size, shape and weight of undesirable materials like trash, clods pebbles. • **Select appropriate processing machinery-** Select the most suitable processing equipments based on various physical characters of seed for processing. • **Attend pre-cleaning-**Undertake pre-cleaning based on quality and use appropriate processing machine. • **Undertake basic cleaning-**Prepare the machinery required for basic seed cleaning and undertake basic seed cleaning. • **Undertake upgrading of the seed-**Decide as to whether the cleaned seed require further upgrading and use appropriate equipment to upgrade the seed. • **Document various operations-**Ensure maintenance of various documents and enter the details of operations as per the seed act requirement. • **Practice health and safety at the work place-**familiarise with various safety and health measures both at the processing plant, store place and adopt the same.		

This course encompasses 5 out of 5 National Occupational Standards (NOS) of "Seed Processing Plant Technician" 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	• Understand General Discipline in the class room (Do's & Don'ts) • Study the importance of good quality seed in crop production and higher productivity • Understand basic principles involved in seed processing to achieve good quality seed • Study various methods of seed cleaning / processing • Understand the Role of a Seed Processing Plant Technician and the progression pathway	Laptop, white board, marker, projector
2	**Prepare and maintain work area and process machineries for seed processing** **Theory Duration** (hh:mm) 15:00 **Practical Duration** (hh:mm) 25:00 **Corresponding NOS Code** AGR /N7115	• Understand about the quality of raw seed meant for processing and familiarise with the methods to check the raw seed quality properly • Decide whether seed moisture in the raw seed is suitable for processing and take a decision to dry the raw seed if required. • Dry the seed either in the sun or use equipments for drying. • Familiarise with the working of various equipments, such as scalper air cleaner, gravity separators. • Know about the kind of crops seed that is to be processed and its initial quality. • Decide the type of machine to be used based on the raw seed quality to achieve proper cleaning. • Ensure proper sequencing of machine to process given volume of seed without back log. • Prepare an alternate plan which is flexible enough to bypass any machine/step in processing if required. • Ensure returning of full/part of seed for re cleaning if needed.	Laptop, white board, marker, projector, Audio-visual aids, Seed trier, moisture meter, hot air oven for seed drying / testing the moisture, scalper, seed cleaner (air screen cleaner) elevators conveyors and storage bins

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		Cleaning and maintenance of tools, equipments & machineries	
3	**Prepare for operating seed processing machineries** **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 20:00 **Corresponding NOS Code** AGR/N7116	• check the raw seed moisture • Know about various air drying methods and choose the right one, whether sun drying or forced air drying • Examine the raw seed quality and choose proper cleaning machine based on the physical properties of the undesirable material. • Ensure functioning of all machines meant for pre cleaning and basic cleaning. • Undertake minor adjustments and repair in any machine if required after proper checking	Laptop, white board, marker, projector, Audio-visual aids, Drying yard for sundrying, forced air driers, heated air dryer. Layer in Bin, Batch in Bin, Batch Dryer, continuous dryer, Bag drying.
4	**Operate seed processing machineries** **Theory Duration** (hh:mm) 15:00 **Practical Duration** (hh:mm) 25:00 **Corresponding NOS Code** AGR/N7117	• Undertake Rough cleaning (Pre cleaning) the seed by Scalping/scarifying to remove trash, stones, clods which are larger than seed. • Undertake actual cleaning and grading (basic seed cleaning) of pre cleaned seed. • Remove undesirable material from pre cleaned seed using air screen cleaner. • Choose the right type of seives based on the size, shape and weight of the seed. • Adjust the processing equipment regulating the feeding level of seed, use of variable screen shake, adjusting the screen pitch to ensure precision cleaning • Undertake precision cleaning if needed by using either screen dams or scalper apron or oil cloth drape or blanking screen • Decide whether upgrading the cleaned seed is desirable & if so, undertake the upgrading • Collect the seed after upgrading in appropriate packing material such as	Laptop, white board, marker, projector, Audio-visual aids, Scalper / rough cleaner Huller + scarifier pebble mill, maize sheller. Air screen cleaner various types of sieves such as oblong, round, triangular and wire mesh, elevators conveyors. gravity separators, ESM pneumatic separators, spiral separator indented cylinder. Gunny bags, HDPE bags, Cloth bag, metal container (tins) Cartoon boxes, lead seal, sealing machine. Scale balance or electronic balance for weighing, automatic weighing, filling and closing machine for

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		gunny bags, HOPE bags, cloth bags, cartoons, tin containers as per requirements. close the bags using bag closure. • Draw sample for seed testing in the STL as well as in organization's lab. • Attach producer label and certification tag and ensure sealing of the seed pack.	seeds like vegetables. Producer labels, blue tag, white tag.
5	**Complete documentation and record keeping related to seed processing** **Theory Duration** (hh:mm) 05:00 **Practical Duration** (hh:mm) 10:00 **Corresponding NOS Code** AGR/N7118	• Maintain Raw seed register-Enter the quantity of raw seed received from field. • Check the quantity mentioned in the harvesting report and tally the entry • Maintain Moisture register • Keep the Record of following things: - Initial moisture of raw seed - Record of Dried lots - Final Moisture level of the dried lots - Rejected Seeds lot, Quantity, Date etc - Quantity of Raw seed Processed - Quality of Cleaned seed obtained i.e. crop wise, variety wise and lot wise etc • Maintain Processing register mentioning the time of starting & closing of the processing machine. • Maintain separate register for recleaning of any seed (Crop, variety and lot-wise) and mention the reason for recleaning. • Maintain register for handing over the rejected seed to the respective farmer. • Maintain Stock ledger for packing material (gunny bags, HDPE bags, cloth bags, lead seal etc) • Maintain Stock register for seed treatment chemical with proper entry for issuing the chemical for seed treatment.	Raw seed register, processing register, Moisture register, Register for rejected seed. Stock ledger for packing material, stock register for treatment chemicals. Register for receipt and issuance of producer label. Register for accounting certification tags. Register for seed sampling and entry of test report, movement register for handing over the cleaned tested seed to the store incharge.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		• Maintain register for labels, received enter the details with serial number issued for packing date wise. • Maintain separate register for the receipt and issuance of certification tag received from the certification officer • Maintain separate register for withdrawal of seed sample for seed testing date wise, crop, variety and class wise and enter test result reported from the seed testing laboratory. • Maintain record for handing over of the cleaned / tested seed to the store i/c. • Maintain Muster roll register with proper entries for various group of workers unskilled, semi skilled, daily paid etc.	
6	**Ensure safety hygiene and sanitation for seed processing** **Theory Duration** (hh:mm) 10:00 **Practical Duration** (hh:mm) 15:00 **Corresponding NOS Code** AGR/N7114	• Familiarise with various risks involved in various stages of seed processing. • Use dust mask and if needed dust glasses (goggles) to avoid respiratory, skin and eye irritation. • Provide protection by erecting screen in such part of the machine where damage to operator's body is possible • Use emergency switches in case of emergency to stop machine. • Remove accumulated dust inside the plant to avoid fire hazard. • Use fire control system if there is any fire break • Store seed treatment chemicals at safe place • Handle the chemicals as per instruction in the label. • Dispose empty container safely and immediately after use. • Avoid smoking, drinking, eating while handling pesticides. • Use antidote in case of emergency clean the processing machinery regularly to avoid dust accumulation and chocking of machine. • Maintain sanitation of processing	Laptop, white board, marker, projector, , Personal protective equipment Like: Helmet / head gear, safety gloves, Safety boots, First Aid Kit: Bandages, Adhesive bandages, Betadine Solution / ointment, Pain relief spray / ointment, Antiseptic liquid; Antidote, Phone directory, Search lights, fire extinguisher Metal screen at various part, Cleaning machine with forced air flow, Spray equipments, fumigation cover.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		plant and store by spraying pesticides and fumigation.	
7	**Soft Skills/ Computer Literacy/ Financial Literacy/ Entrepreneurship Skills** **Theory Duration** (hh:mm) 20:00 **Practical Duration** (hh:mm) 20:00 **Corresponding NOS Code**	• Basic Communication & Presentation Skills • Organizational 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 etc • 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) **120:00**	**Unique Equipment Required:** Laptop, white board, marker, projector, Audio-visual aids, Seed trier, moisture meter, hot air oven for seed drying / testing the moisture, scalper, seed cleaner (air screen cleaner) elevators conveyors and storage bins, Drying yard, forced air driers, heated air dryer, Layer in Bin, Batch in Bin, Batch Dryer, continuous dryer, Bag drying, Scalper / rough cleaner Huller + scarifier pebble mill, maize sheller, Air screen cleaner various types of sieves such as oblong, round, triangular and wire mesh, elevators conveyors, gravity separators, ESM pneumatic separators, spiral separator indented cylinder, Gunny bags, HDPE bags, Cloth bag, metal container (tins) Cartoon boxes, lead seal, sealing machine, Scale balance or electronic balance for weighing, automatic weighing, filling and closing machine for seeds like vegetables. Producer labels, blue tag, white tag, Various registers, PPEs	

Grand Total Course Duration: **210 Hours, 0 Minutes**

*(This syllabus/ curriculum has been approved by **Agriculture Skill Council of India)***

Trainer Prerequisites for Job role: "Seed Processing Plant Technician" mapped to Qualification Pack: "AGR/Q7104, v1.0"

Sr. No.	Area	Details
1	**Description**	Trainer is responsible for educating the trainees – Maintain the work area, Organize raw seeds & equipments for processing, Operate and maintain process machineries and tools for seed processing, Store & pack processed seeds, Maintain different types of register, Ensure safety & sanitation at the workplace
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**	B.Sc. (Agriculture)
4a	**Domain Certification**	Certified for Job Role: "Seed Processing Plant Technician" mapped to QP: "AGR/Q7104, 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**	• 3+ Years experience in seed production especially in seed processing/ Seed quality control for B.Sc (Ag.) • 2 years experience in seed production / processing / quality control for M.Sc. (Ag) (agronomy, Plant breeding) • 1 Years experience in seed production/ processing/ quality control for M.Sc (Ag) seed technology.

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Seed Processing Plant Technician
Qualification Pack	AGR/Q7104, 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 canter based on this criteria
5	To pass the Qualification Pack, every trainee should score a minimum of 70% in aggregate
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack

Assessable outcomes	Assessment criteria	Total Marks	Out Of	Theory	Skills Practical
1. AGR/Q7115: Prepare and maintain work area and process machineries for seed processing	PC1. clean and maintain the cleanliness of the work area using approved sanitizers and keep it free from dust, waste, and pests		15	5	10
	PC2. ensure that work area is safe and hygienic for seed processing		10	2	8
	PC3. dispose waste materials as per organisation standards and industry requirements		15	5	10
	PC4. check the working and performance of all machineries and equipments used for the process such as cleaner, scalper, air screen cleaner, specific gravity separator, indented cylinder, bucket elevator, treater, etc.		15	5	10
	PC5. clean the machineries and tools used with recommended sanitizers following specifications and organisation standards		15	5	10
	PC6. place the necessary tools required for process		5	1	4
	PC7. attend minor repairs/faults of all machines, if required		15	5	10
	PC8. select and set the machines and tools required		10	2	8
			100	**30**	**70**
2. AGR/Q7116: Prepare for operating seed processing machineries	PC1. ensure working and performance of all machineries required for process		15	5	10
	PC2. report malfunctions of machine, if any, to the supervisor		10	2	8

	PC3. calculate the process time for effective utilization of machineries and manpower		15	5	10
	PC4. allot responsibilities/ work to the assistants and helpers		15	5	10
	PC5. check the quality of raw seeds by verifying the quality analysis report and assessing its physical parameters		15	5	10
	PC6. start machine and check the working condition and performance of the machine		15	5	10
	PC7. make minor adjustments and repairs (if required)		5	1	4
	PC8. keep the tools accessible to attend repairs/faults in case of breakdown		10	2	8
			100	**30**	**70**
3. AGR/Q7117: Operate seed processing machineries	PC1. receive the raw seed into the processing plant		5	2	3
	PC2. ensure that the seed is fed into the input pit for the processing to begin		5	2	3
	PC3. allow the bucket elevator to transfer the seed into the pre-cleaner		5	2	3
	PC4. turn on the pre-cleaner to remove external materials such as trash, stones, dust, etc.		5	2	3
	PC5. turn valves to feed the partially cleaned seed into the cleaner cum grader to remove undersized seeds.		5	1	4
	PC6. set and control the bucket elevator to feed the cleaned and sized seed into the indented cylinder wherein broken and short seeds would be separated.		5	1	4
	PC7. ensure that the graded seed is fed into the specific gravity separator for removing light seeds, as they are immature		5	1	4

PC8. treat seeds coming out of the specific gravity separator by making them pass through the treater, which treats seeds by coating seeds with chemicals, to prevent formation of fungus on seeds.	10	3	7
PC9. report malfunction/discrepancies/concerns in machineries to department supervisor for immediate action.	5	1	4
PC10. ensure collection of the processed seeds from the processing area	5	1	4
PC11. procure bags for bagging of seeds	5	1	4
PC12. fill the bag with seeds to an exact weight, using a weighing scale, and as advised by the department supervisor	5	1	4
PC13. close the bag either manually or by using a bag closer	2.5	0.5	2
PC14. label the seed bag by attaching it to the seed bag, or by printing it directly on the seed bag	10	3	7
PC15. ensure that the label contains all important information about the seed	5	2	3
PC16. ensure that complete processing records are maintained to trace the seed from the time it is received at the plant till storage, with full details of operations	5	2	3
PC17. monitor the storage of the processed seeds until planting time	2.5	0.5	2
PC18. ensure the seeds are stored in dry and cool conditions	5	2	3
PC19. ensure preservation of seed viability during storage	5	2	3

			100	**30**	**70**
4. AGR/Q7118: Complete documentation and record keeping related to seed processing	PC1. document and maintain records of seeds such as type of seeds, tag details such as supplier details, receiving date, supplier quality document, quality parameters for all seeds, internal quality analysis report, storage condition etc, as per company standards		8	6	2
	PC2. maintain record of observations (if any) related to seeds		7	4	3
	PC3. load the seeds details in ERP for future reference		7	4	3
	PC4. document details such as, equipments and machinery details, efficiency and capacity utilization of equipment etc		7	4	3
	PC5. document process details like type of seeds used, and other process parameters		7	4	3
	PC6. document batch size, production yield, and wastage of seeds, energy utilization and final seeds processed		7	4	3
	PC7. maintain record on observations (if any) or deviations related to process and production		7	4	3
	PC8. load the process details in ERP for future reference		7	4	3
	PC9. verify documents and track from finished product to raw materials , in case of quality concerns and for quality management system audits		7	4	3
	PC10. document and maintain records on the types of processed seeds produced		7	4	3
	PC11. document the processed seeds details such as seed type, batch		8	6	2

	number, time of packing, other label details, primary, secondary and tertiary packaging materials for all processed seeds, storage conditions etc, as per organisation standards				
	PC12. maintain record on observations or deviations (if any) related to finished products		7	4	3
	PC13. load the finished product details in ERP for future reference		7	4	3
	PC14. verify the documents and track from finished product to raw materials, in case of quality concerns and for quality management system audits		7	4	3
			100	**60**	**40**
5. AGR/Q7114: Ensure safety, hygiene and sanitation for processing seeds	PC1. comply with safety and sanitation procedures and standards		8	3	5
	PC2. ensure personal hygiene by use of gloves, hairnets, masks, ear plugs, goggles, shoes, etc.		8	2	6
	PC3. ensure testing of seeds is carried out in a hygienic manner		8	2	6
	PC4. use safety equipment such as fire extinguisher, first aid kit and eye-wash station when required		8	2	6
	PC5. follow housekeeping practices by having designated area for materials/tools		8	3	5
	PC6. attend training on hazard management to understand types of hazards such as physical, chemical and biological hazards and measures to control and prevent them		8	3	5
	PC7. identify, document and report problems such as rodents and pests to management		10	2	8

	PC8. conduct workplace checklist audits before and after work to ensure safety and hygiene		8	3	5
	PC9. document and maintain records of raw material, packaging material, process and finished products		8	3	5
	PC10. determine the quality of seeds using criteria such as appearance, size, weight, germination capacity, etc		8	3	5
	PC11. store raw seeds, processed seeds, separately to prevent cross-contamination		8	2	6
	PC12. label raw seeds and processed seeds and store them in designated storage areas according to standard operating procedures		10	2	8
			100	**30**	**70**
Total		**500**	**500**	**180**	**320**
Percentage Weightage:				**36%**	**64%**
Minimum Pass% to qualify (aggregate):				**70%**	