



Model Curriculum

Micro Credential: Quality Assurance in Grain Storage

MCr Code: AGR/MCr-0005

Version: 1.0

NSQF Level: 3.5

Model Curriculum Version: 1.0

Agriculture Skill Council of India || Unit No. 101, First Floor, Greenwoods Plaza,
Block 'B', Greenwoods City, Sector 45, Gurugram -122009, Haryana.

Table of Contents

Training Parameters.....	3
Program Overview	3
Training Outcomes.....	4
Compulsory Modules.....	4
Module 1: Prepare grain storages and maintain hygiene.....	4
Module 3: Monitor grain quality.....	5
Module 4: Control weeds and pests in storage area	6
Trainer Requirements	8
Assessor Requirements.....	8
Assessment Strategy.....	9
References	15
Glossary.....	15
Acronyms and Abbreviations.....	16

Training Parameters

Sector	Agriculture
Sub-Sector	Agriculture Industries
Occupation	NA
Country	India
NSQF Level	3.5
Aligned to NCO/ISCO/ISIC Code	NCO/2015-NIL
Minimum Educational Qualification and Experience	<p>11th Grade pass or equivalent with 1 year of relevant experience in Agriculture and Allied Sectors</p> <p>OR</p> <p>Completed 1st year of 3-year diploma* after 10th</p> <p>OR</p> <p>10th grade pass with 1.5-year of relevant experience in Agriculture and Allied Sectors</p> <p>OR</p> <p>8th Grade pass with 4.5-years of relevant experience in Agriculture and Allied Sectors</p> <p>OR</p> <p>Previous relevant Qualification of NSQF Level 3 with 1.5-year experience in Agriculture and Allied Sectors</p> <p>OR</p> <p>Previous relevant Qualification of NSQF Level 2.5 with 3-year experience in Agriculture and Allied Sectors</p> <p><i>*Agriculture/Horticulture/Forestry/Agriculture Engineering</i></p>
Pre-Requisite License or Training	NA
Minimum Job Entry Age	NA
Last Reviewed On	30-04-2024
Next Review Date	30-04-2027
NSQC Approval Date	30-04-2024

QP Version	1.0
Model Curriculum Creation Date	30-04-2024
Model Curriculum Valid Up to Date	30-04-2027
Model Curriculum Version	1.0
Minimum Duration of the Course	15 Hours
Maximum Duration of the Course	15 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:

- Prepare grain storages
- Maintain hygiene in storage areas
- Monitor grain quality from arrival to dispatch
- Monitor and maintain grain condition in storage
- Control weeds and pests in storage area

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
AGR/MCr-0005: Quality Assurance in Grain Storage MCr Version: 1.0 MCr Level: 3.5	10:00	5:00	0:00	0:00	15:00
Module 1: Prepare grain storages and maintain hygiene	04:00	01:00	0:00	0:00	05:00
Module 2: Monitor grain quality	04:00	02:00	0:00	0:00	06:00
Module 3: Control weeds and pests in storage area	02:00	02:00	0:00	0:00	04:00
Total Duration	10:00	5:00	0:00	0:00	15:00

Module Details

Module 1: Prepare grain storages and maintain hygiene

Mapped to AGR/MCr-0005

Terminal Outcomes:

- Prepare grain storages
- Maintain hygiene in storage areas

Duration: 04:00	Duration: 01:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> ● Explain the work program instructions in the storage area ● Discuss work health and safety hazards in grain storage ● Enlist and discuss about the tools and equipment required in the storage area ● Explain the safe disposal methods of the storage area ● Explain the procedure to clean the storage site contaminants and residues ● Explain the significance of maintaining the hygiene in the grain storage area ● Explain about the hygiene standards according to the grain storage programme ● Explain types, levels and control methods for a range of pests and contaminants ● Discuss permanent and temporary storage configurations and operations in the storage area ● Explain the steps to maintain proper aeration and ventilation in the storage area to prevent mold growth and insect infestation ● Discuss the safe chemical handling and dangerous goods requirements ● Explain the range of applicable pesticides, their uses, application methods and handling requirements ● Discuss grain commodity types, varieties and grades, marketing requirements and options for grain growers 	<ul style="list-style-type: none"> ● Select and check, personal protective equipment (PPE) required in the storage ● Dispose of waste according to workplace Standard Operating Procedures (SoP) ● Demonstrate the procedure to clean storage site contaminants and residue from bulk material storage facility according to workplace and biosecurity procedures ● Examine structural integrity, damage or deterioration of bulk material storage facility according to workplace procedures ● Demonstrate conducting pre checks and required adjustment of bulk material handling equipment according to manufacturer instructions and workplace requirements ● Demonstrate updating grain storage preparation records according to workplace procedures ● Inspect, report or repair damage and faults in the storage areas according to workplace procedures ● Demonstrate application of treatments to storage facilities to ensure hygiene standards are maintained according to grain storage program ● Record application of treatments according to workplace procedures
Classroom Aids	

White board, Marker, Overhead projector, Laptop, Internet access,

Tools, Equipment and Other Requirements

Disinfectant, sprayer/duster, PPE kit, different types of grain commodity, record-book

Module 2: Monitor grain quality

Mapped to AGR/MCr-0005

Terminal Outcomes:

- Monitor grain quality from arrival to dispatch
- Monitor and maintain grain condition in storage

Duration: 04:00	Duration: 02:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> ● Enlist the grain storage activities and storage management according the grain storage programme ● Explain the sampling and classification requirements of grains ● Explain the methods for storing grain in grain storage facilities ● Explain the commodity quality standards for grain storage ● Explain the machinery and equipment used in grain storage work ● Enlist common problems and contingencies in grain storage situations ● Discuss workplace health and safety practices and personal protection ● Explain the appropriate handling and transportation methods of grains to avoid damage and contamination ● Explain the grain sample collection methods ● Discuss necessary documentation requirements in the grain storage area according the SOP ● Explain the grain storage monitoring methods according to the SOP 	<ul style="list-style-type: none"> ● Collect samples of grain and refer for testing prior to storage sample grain at a frequency specified in sampling procedures to ensure compliance with purity standards ● inspect grain quality at time of dispatch against records at point of storage for consistency ● Take, prepare and forward test samples for analysis according to workplace procedures and industry standards ● Maintain records of grain storage movement according to workplace standard operating procedures (SOP) ● inspect stored grain for contaminants and deterioration according to workplace procedures and schedules ● Check grain in long-term storage for quality factors and viability according to workplace procedures and schedules ● Collect, prepare and send samples of grain for laboratory testing according to industry quality assurance and laboratory standards ● Create and maintain records of grain tests and inspections according to grain storage program. ● Monitor condition of stored grain according to schedule and methods specified in grain storage program and Implement corrective action to maintain grain quality standards according to workplace procedures ● Ensure grain storage activities and facilities management are conducted according to grain storage program
Classroom Aids	
White board, Marker, Overhead projector, Laptop, Internet access,	

Tools, Equipment and Other Requirements

Plastic bags, labels, cutting knife

Module 3: Control weeds and pests in storage area

Mapped to AGR/MCr-0005

Terminal Outcomes:

- Control weeds and pests in storage area
- Implement Integrated Pest management practices

Duration: 02:00	Duration: 02:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain Integrated Pest Management (IPM) principles and the procedures used within the organization • Discuss about insect life cycles and optimum conditions for development • Explain about range of applicable pesticides, their uses, application methods and handling requirements • Explain legislative requirements, codes of practice and workplace procedures relating to quality standards and grain storage 	<ul style="list-style-type: none"> • Monitor grain according to the monitoring parameters, moisture content, temperature and insect infestation as per workplace procedures • Collect samples of grain to test for pest infestation • Prepare and forward sample for analysis according to workplace procedures and industry standards • Identify pests in storage according arrange for the necessary control measures • oversee the regular fumigation and treatments in enclosed stored grain and surrounding environment according to pest management strategy • Identify and control sources of infestation according to the pest management strategy and biosecurity procedures in grain storage facility • Create and maintain records of treatments to grain and storage facilities according to workplace procedures
Classroom Aids	
White board, Marker, Overhead projector, Laptop, Internet access,	
Tools, Equipment and Other Requirements	
Pesticides, fumigants, sprayer, duster, PPE kit, record-book	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Diploma	Regular Diploma in Supply Chain Management, Logistics Management, Inventory Control/Management or equivalent degree [After 10+2]	3	Post-harvest Supply Chain Management	0		
Any Graduate	BSc/ BBA in Logistics and Supply Chain Management, Inventory Control, Inventory Management or an equivalent degree	2	Post-harvest Supply Chain Management	0		For school Program minimum qualification of Trainer should be Graduate. Their Teaching experience will be considered industry experience
Graduate	Graduate (Agriculture / Horticulture)	1	Post-harvest Supply Chain Management	0		
Post- Graduate	Post-Graduate (Agriculture / Horticulture/ Agriculture Statistics)	0	Post-harvest Supply Chain Management	0		
Trainer Certification						
Domain Certification			Platform Certification			
Certified for NOS “ Quality Assurance in Grain Storage ”, mapped to NOS: “AGR/MCr-0005, v1.0”, 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	
Graduation	B.Sc. (Agriculture/Botany/SCM/Inventory Management Agriculture Statistics /Horticulture and related streams)	3	Post-harvest Supply Chain Management	0		
Post-graduation	M.Sc. (Agriculture/Botany/SCM/Inventory Management/Agriculture Statistics /Horticulture and related streams)	2	Post-harvest Supply Chain Management	0		
PhD	PhD (Agriculture/ Botany/SCM/ Inventory Management/Agriculture Statistics/Horticulture and related streams)	1	Post-harvest Supply Chain Management	0		

Assessor Certification

Domain Certification	Platform Certification
Certified for NOS “ Quality Assurance in Grain Storage ”, mapped to NOS: “AGR/MCr-0005, v1.0”, 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:

- GeoTagging 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
NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
DF	Dense Forest
PA	Protected Areas
NTFP	Non-Timber Forest Produce
MFFCM	Modern Forest fire Control Methods
JFM	Joint Forest Management
FSI	Forest Survey of India
FRI	Forest Research Institute
FFCM	Forest Fire Control & Management
CS	Conservation & Survey
CNFA	Cultivable Non-Forest Area
AFM	Advanced Forest Management
PPE	Personal Protective Equipment
WII	Wildlife Institute of India
OJT	On-the-job Training
PwD	People with Disability
PPE	Personal Protective Equipment