

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AGRICULTURE AND ALLIED INDUSTRY

What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualifications Pack- Mushroom Grower

SECTOR: AGRICULTURE AND ALLIED

SUB-SECTOR: Agriculture Industries

OCCUPATION: Agri Entrepreneurship & Rural Enterprises

REFERENCE ID: AGR/Q7803

ALIGNED TO: NCO-2015/NIL

The person should be able to cultivate mushrooms using good agricultural practices.

Brief Job Description: A mushroom grower primarily carries out ex-situ cultivation of mushrooms intensively or extensively depending upon the availability of land, investment & resources.

Personal Attributes: Needs to have knowledge of the different types of mushroom and their different growing conditions, and possess an eye for details. Should use appropriate rule and tool, using quality concept, be responsible and work in a team, and have knowledge in basic arithmetic calculations, and oral & written communication skill.

Job Details	Qualifications Pack Code	AGR/Q7803		
	Job Role	Mushroom Grower		
	Credits	TBD	Version number	1.0
	Sector	Agriculture and Allied	Drafted on	31/01/16
	Sub-sector	Agriculture Industries	Last reviewed on	30/10/16
	Occupation	Agri Entrepreneurship & Rural Enterprises	Next review date	30/10/19
	NSQC Clearance On	NA		

Job Role	Mushroom Grower
Role Description	Grows mushroom in ex-situ habitat in small landholdings or at a larger depending upon the availability of land, investment and resource.
NSQF level	4
Minimum Educational Qualifications	8 th Standard pass, preferably
Maximum Educational Qualifications	NA
Training (Suggested but not mandatory)	NA
Minimum Job Entry Age	18 years
Experience	NA
Applicable National Occupational Standards (NOS)	Compulsory: <ol style="list-style-type: none"> 1. AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms 2. AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms 3. AGR/N7815 Undertake disease control and pest management activities, casing and pinning for mushroom cultivation 4. AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms 5. AGR/N9908 Undertake basic entrepreneurial activities for small enterprise 6. AGR/N9903 Maintain health & safety at the workplace Optional: NA
Performance Criteria	As described in the relevant OS units

Definitions

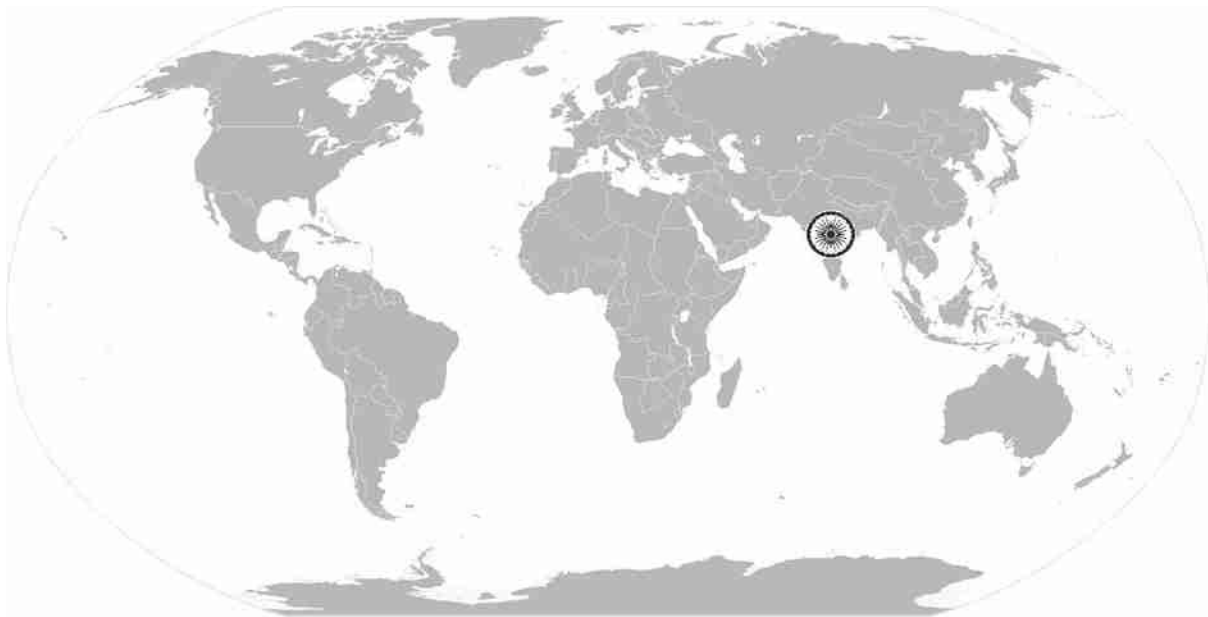
Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-Sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Sub-functions	Sub-functions are sub-activities essential for achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an 'N'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.

Acronyms

Keywords /Terms	Description
NSQF	National Skill Qualification Framework
NSQC	National Skill Qualification Committee
GAP	Good Agricultural Practices

AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms

National Occupational Standard



Overview


This unit refers to the necessary skills and knowledge of a mushroom grower to prepare and pasteurize the compost necessary to cultivate mushrooms.

AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms

National Occupational Standard

Unit Code	AGR/N7813
Unit Title (Task)	Prepare and pasteurize the compost necessary to cultivate mushrooms
Description	This OS is designed to summarize the required skills and knowledge of a mushroom grower in preparing a compost appropriate for mushroom cultivation, using suitable tools, materials and techniques.
Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> • Select appropriate materials to prepare the compost • Identify different types compost • Select the methods of composting • Post-work activities
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Select appropriate materials to prepare the compost	<p>The user/individual on the job should be able to:</p> <p>PC1. identify different types of base materials from various agricultural by-products, e.g. freshly harvested paddy straw, wheat straw, mustard straw, etc.</p> <p>PC2. select materials which acts as a reservoir of cellulose, hemi-cellulose and lignin, and is utilized by the mushroom species during its growth as a carbon source</p> <p>PC3. identify materials that have nitrogen (N) and carbon (C) ratio 1: 10 for the establishment of the bacterial flora in the compost</p> <p>PC4. select materials that acts as a nutrient source, impart proper physical structure to the substrate, ensure adequate aeration during composting, and add bulk to the compost</p> <p>PC5. select chemicals for rectifying the mineral deficiencies in the compost such as muriate of potash, super phosphate, urea, calcium ammonium nitrate, ammonium sulphate, etc.</p> <p>PC6. identify chemicals which has a stabilizing effect on ammonium content, serves as a calcium source for the mushroom and also for the oxalic acid produced by the mushroom mycelium, which gets converted into calcium oxalate, e.g. gypsum and calcium carbonate</p> <p>PC7. select the necessary tools required to produce a compost</p>
Identify different types compost	<p>The user/individual on the job should be able to:</p> <p>PC8. compute different formulations of composting ingredients to achieve the required nitrogen and carbon ratio for mushroom compost</p> <p>PC9. identify the types of compost—natural and synthetic</p> <p>Natural compost: Horse manure, wheat straw, chicken manure, urea,</p>

AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms

	brewer's grain, paddy straw, bagasse, mustard straw and gypsum Synthetic compost: Wheat straw, paddy straw, calcium ammonium nitrate, urea, superphosphate, muriate of potash, wheat bran, molasses, gypsum and lindane dust
Select the methods of composting	The user/individual on the job should be able to: PC10. select the method of composting with respect to the availability of steam pasteurization Methods: Short, Long; Indoor, Outdoor PC11. ensure to sprinkle water over the compost regularly after an interval of a day PC12. rotate the compost after an interval of 2–3 days regularly to allow gas exchange, adequate moisture, and carbohydrates throughout the process PC13. store the agricultural by-products under cover to minimize growth of unwanted and potentially detrimental fungi and bacteria PC14. pasteurize the compost to kill insects, nematodes, pest fungi, or other pests
Post-work activities	The user/individual on the job should be able to: PC15. identify the attributes of a good compost—dark brown in colour, non-greasy, inoffensive sweet smell, ammonia free, no insects and nematodes PC16. leave the work in a safe condition  PC17. return used tools and materials in appropriate storage area PC18. dispose wastes materials in accordance with environmental health & safety guidelines PC19. report any work related problems or issues to responsible authority and seek guidance on how to rectify problems PC20. exercise safe handling practices while handling sharp tools and equipment
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant health and safety requirements applicable in the mushroom farm KA2. own job role and responsibilities and sources for information pertaining to mushroom growing KA3. who to approach for support in order to obtain mushroom growing related information, clarifications and support KA4. importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business KA5. documentation and related procedures applicable in the context of mushroom growing
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. role of compost in mushroom cultivation KB2. what is composting, its purpose and features as a process Features: Controlled, temperature-dependent, ecological process, uses air to maintain a temperature range, best suited for microorganisms to grow and reproduce

AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms

	KB3. appropriate equipment and materials used during the preparation of compost KB4. varied types of compost KB5. how to bring Carbon: Nitrogen ratio to the desired level to activate microflora in the compost KB6. how to evaluate formulation of different compost KB7. various methods of composting Method: Short, Long: Indoor, Outdoor KB8. role and where to use steam pasteurization in composting methods KB9. sequence and duration of composting in various methods KB10. pasteurization and its different methods KB11. hazards and risks associated with composting and how to control injury to self KB12. how to determine quality of compost
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. formulate the values of components of different compost using basic arithmetic calculations SA2. note down the activity schedules in logs, registers, etc. in English or local language SA3. write down the chemical formulas SA4. fill details of expenditure incurred, materials, tools, etc. in English or local language
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA5. read basic instructions and information in English or local language related to mushroom growing SA6. read & interpret safety warnings, symbols, signs, formulas, etc. mentioned on tools, equipment and materials
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA7. communicate effectively with co-workers, subordinates, etc. SA8. seek clarification when instructions are not clear in any language understood locally
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. choose the materials to be used for composting SB2. decide on the type of compost to be used for mushroom cultivation SB3. determine the method of composting to be used SB4. assess the quality of the compost

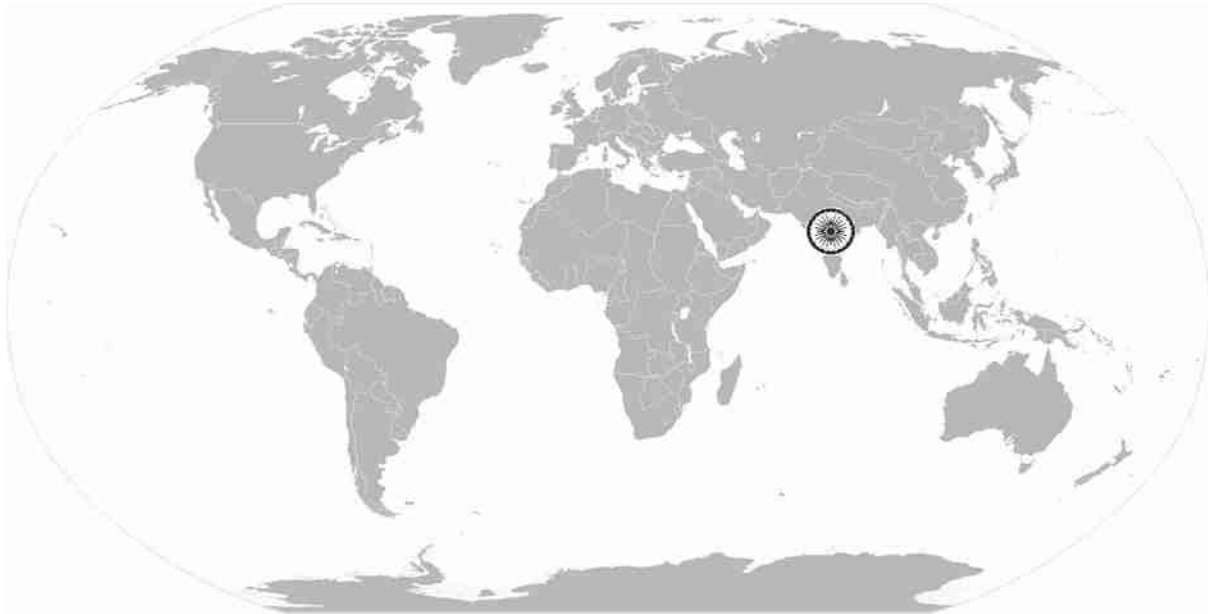
AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms

	Plan and Organize
	The user/individual on the job needs to know and understand: SB5. all activities necessary to prepare a good compost for mushroom cultivation as per standard quality procedures
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB6. use customer demand as a key factor for production targets SB7. assess and meet customer satisfaction objectives to guide quality considerations at work SB8. present oneself and deal with customers in a professional and courteous manner SB9. ensure customer receives a fair deal in business transactions with the organization
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB10. solve various problems faced during the preparation of the compost and methods of composting SB11. avoid the heating up tendency of the compost
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB12. use materials for the compost to make it more cost effective SB13. assume the labour cost for composting SB14. analyze the method of composting which is commercially beneficial
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB15. apply, analyze, and evaluate the information gathered from observation, experience, reasoning, or communication, as a guide to thought and action

AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms

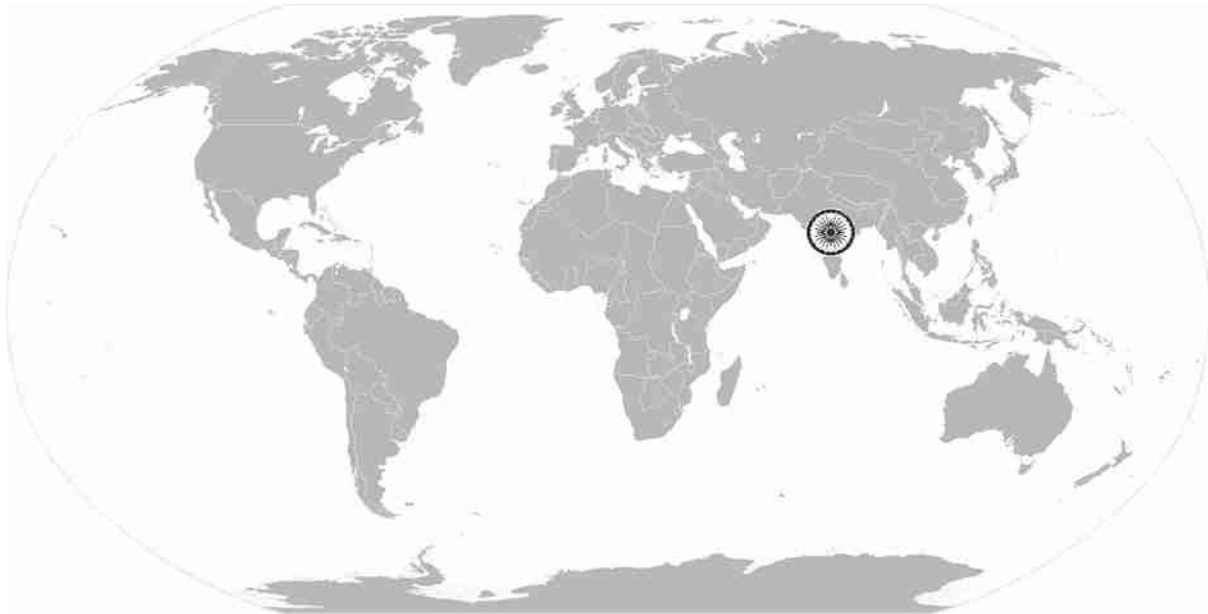
NOS Version Control

NOS Code	AGR/N7813		
Credits	TBD	Version number	1.0
Industry	Agriculture and Allied	Drafted on	31/01/16
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Occupation	Agri Entrepreneurship & Rural Enterprises	Next review date	30/10/19



AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms

National Occupational Standard



Overview

This unit refers to the necessary skills and knowledge of a mushroom grower to select commercially important species of mushrooms and design the appropriate site for mushroom cultivation.

AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms

National Occupational Standard

Unit Code	AGR/N7814
Unit Title (Task)	Select commercially important species of mushroom and design appropriate site to cultivate mushrooms
Description	This OS is designed for the mushroom grower to identify the commercially important species of mushrooms and to design the layout of the farm suitable for mushroom cultivation.
Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Select commercially important type of mushroom • Select appropriate mushroom cultivation site • Design and construct mushroom farm
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Select commercially important type of mushroom	The user/individual on the job should be able to: <ul style="list-style-type: none"> PC1. select the type of mushroom based on market's demand, climatic conditions of the farm, growing season, investments, etc. Type: Example— <i>Agaricus bisporus</i> (white button), <i>Lentinula edodes</i> (shiitake), <i>Pleurotus</i> species (oyster), <i>Calocybe indica</i> (milky mushrooms), etc. PC2. collect mushroom spawns from reliable sources, e.g. nearest Krishi Vigyan Kendra (KVK), etc. PC3. select species which will be cost effective and economically beneficial according to market research PC4. identify the type of mushroom with more shelf life as per industry standard PC5. select freshly prepared spawns because the mycelium is in the state of active growth
Select appropriate mushroom cultivation site	The user/individual on the job should be able to: <ul style="list-style-type: none"> PC6. undertake site assessment based on the following requirements Requirements: size of available land, agro-climatic conditions like high moisture level—humid, temperature, availability of water resource, availability of farm labour for carrying out construction activities, etc. PC7. locate site easily accessible by main roads and pathways PC8. ensure that the site is deprived of sunlight PC9. ensure proper drainage of rain water
Plan and design a mushroom farm	The user/individual on the job should be able to: <ul style="list-style-type: none"> PC10. prepare and check the suitability of design and layout of the farm according to the growing conditions required for different kinds of mushrooms Types: Example— Simple brick walls covered with asbestos sheets with false ceiling, Thatched roof with false polythene ceiling, Steel pipe frame with heavy density polythene covering, Bamboo frame and synthetic fibre cloth

AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms

	<p>inside and paddy straw insulation outside, Polythene bags, Puf panelled bulk chamber, etc.</p> <p>PC11. ensure availability of fresh water supply for the mushroom growing facility</p> <p>PC12. ensure effective underground drainage system or gutters for carrying out waste water</p> <p>PC13. use safe and reliable construction techniques to build required fixtures for mushroom growing</p> <p>PC14. use crop rotation method for mushroom cultivation</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant legislation, standards, policies, and procedures in mushroom farms</p> <p>KA2. relevant health and safety requirements applicable in the mushroom farms</p> <p>KA3. own job role and responsibilities and sources for information pertaining to mushroom growing</p> <p>KA4. who to approach for support in order to obtain mushroom growing related information, clarifications and support</p> <p>KA5. importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business</p> <p>KA6. documentation and related procedures applicable in the context of mushroom growing</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. types of mushroom species, its growing conditions, and commercial important</p> <p>Types: Example— <i>Agaricus bisporus</i> (white button mushrooms), <i>Pleurotus</i> species (oyster mushrooms), <i>Calocybe indica</i> (milky mushrooms), etc.</p> <p>Growing conditions: e.g. temperature, humidity, season, type of compost</p> <p>KB2. purpose and process of using mushroom spawns</p> <p>KB3. reliable sources of information</p> <p>KB4. importance of selecting the correct spawn</p> <p>KB5. hazards and risks associated with mushroom farms in agricultural land and how to control injury to self</p> <p>KB6. factors determining site selection</p> <p>KB7. various types of tools, equipment, materials and machinery used in construction of mushroom farms</p> <p>KB8. how to determine land requirement for mushroom growing</p> <p>KB9. role of good drainage system in the farm</p> <p>KB10. importance of preparing accurate and effective design and layout</p> <p>KB11. different types of mushroom growing facilities and fixtures</p> <p>Types: Example— Simple brick walls covered with asbestos sheets with false ceiling, Thatched roof with false polythene ceiling, Steel pipe frame with heavy density polythene covering, Bamboo frame and synthetic fibre cloth inside and paddy straw insulation outside, Polythene bags, Puf panelled bulk chamber, etc.</p>

AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms

	<p>KB12. types, components and their specifications of bulk chamber conducive for good quality mushroom growing</p> <p>Types: Single door and two door</p> <p>Components: Foundation, floor of chamber, layer of broken bricks/stones, insulation, walls, roof, doors, exhaust vents, fungal filters, fresh air dampers, centrifugal blower fan</p> <p>Specifications: Materials, depth, thickness, location, numbers, height, etc.</p>
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to:
	SA1. record different types of mushrooms, spawns, activity schedules, construction materials and fixtures, etc. in logs, registers, etc. in English or local language
	SA2. fill details of expenditure incurred, materials, etc. in English or local language
	Reading Skills
	The user/individual on the job needs to know and understand how to:
B. Professional Skills	SA3. read basic instructions and information in English or local language related to work
	SA4. read and interpret safety warnings, symbols, signs, etc. mentioned on tools, equipment and materials
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to:
	SA5. communicate effectively with co-workers, subordinates, etc.
	SA6. seek clarification and understanding where instructions are not clear in any language understood locally
	Decision Making
	The user/individual on the job needs to know and understand how to:
	SB1. decide the commercially important mushrooms
	SB2. decide the quality of spawns
	SB3. decide site based on technical criteria and feasibility such as agro-climatic conditions, size of land, budget, accessibility, type of mushroom to be grown, etc.
	SB4. seek clarification from responsible authority when faced with difficult decisions
	Plan and Organize
	The user/individual on the job needs to know and understand:
	SB5. all activities necessary in a mushroom farm are completed in time and as per standard quality procedures

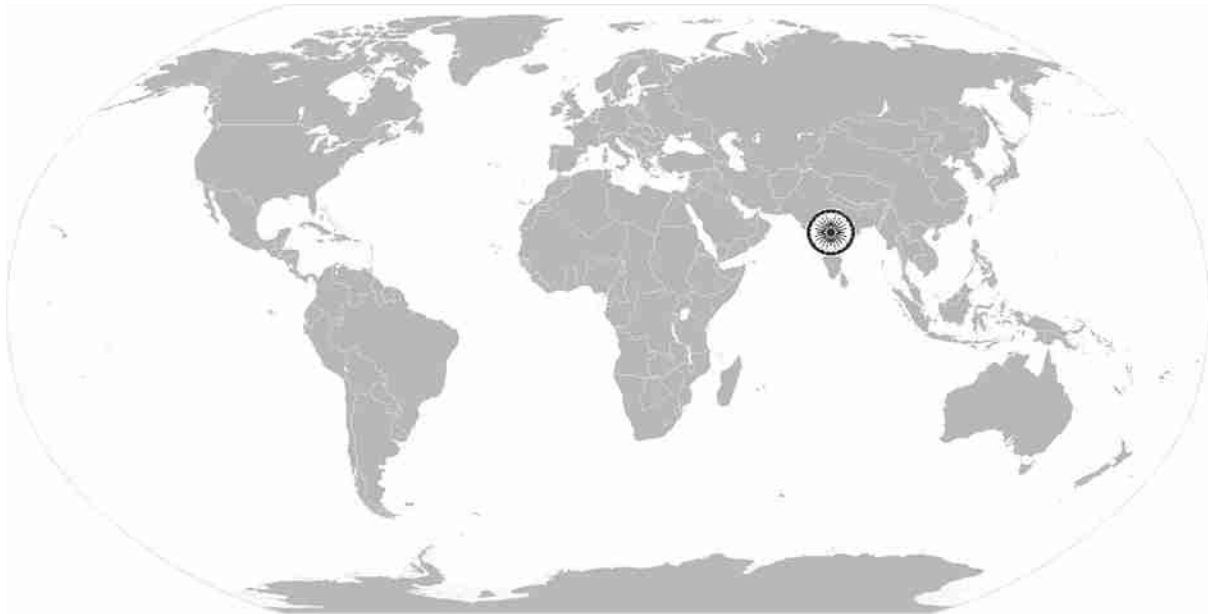
AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms

	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB6. use customer demand as a key factor for production targets SB7. assess and meet customer satisfaction objectives to guide quality considerations at work SB8. present oneself and deal with customers in a professional and courteous manner
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB9. solve various problems faced during the site selection of the farm
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB10. analyze the demand of commercially important mushrooms SB11. assess the design and layout of the farm SB12. analyze cost effective facilities and fixtures required for mushroom farms SB13. assume the labour cost for the construction of mushroom farm
	Critical Thinking
	NA

AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms

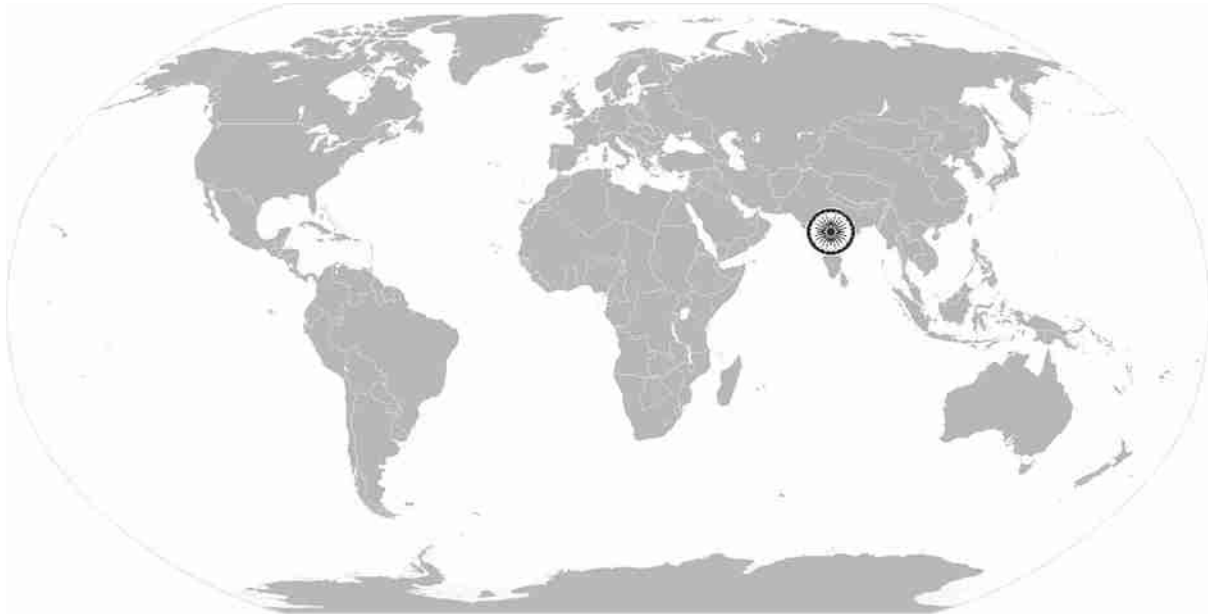
NOS Version Control

NOS Code	AGR/N7814		
Credits	TBD	Version number	1.0
Industry	Agriculture and Allied	Drafted on	31/01/16
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Occupation	Agri Entrepreneurship & Rural Enterprises	Next review date	30/10/19



AGR/N7815 Undertake disease control and pest management activities, casing and pinning for mushroom cultivation

National Occupational Standard



Overview

This unit describes different methods to control disease and pests in mushroom farms along with the necessary skills and knowledge of a mushroom grower for casing and pinning in mushroom cultivation.

AGR/N7815 Undertake disease control and pest management activities, casing and pinning for mushroom cultivation

National Occupational Standard	Unit Code	AGR/N7815
	Unit Title (Task)	Undertake disease control and pest management activities, casing and pinning for mushroom cultivation
	Description	This OS is designed to equip mushroom grower with the required skills and knowledge on how to exercise disease control measures, casing and pinning to cultivate the selected species of mushroom.
	Scope	This unit/task covers the following: <ul style="list-style-type: none"> Control diseases and exercise preventive care Prepare casing soil and pinning
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Control diseases and exercise preventive care	The user/individual on the job should be able to: <ul style="list-style-type: none"> PC1. ensure substrates are not exposed to pathogens or pests during spawning PC2. inspect mushroom bags or beds carefully for early detection of pests and diseases PC3. ensure that flies do not enter the mushroom farms, e.g. not dumping any waste near mushroom farms, installing screens on windows and doors, etc. PC4. use sterilized casing soil, proper disposal of spent compost to control nematodes, mites, insect pests, etc. PC5. spray fungicide after casing to check dry bubble, e.g. dithane Z-78, sporgon, topsin M, chlorothalonil, prochloraz, daconil, etc. PC6. control local infections by spraying the affected patch with commercial formalin PC7. spray chlorinated water to manage bacterial diseases PC8. disinfest mushroom farms by spraying pesticide as a prophylactic measure, e.g. dicofol, etc. PC9. control mites by spraying insecticide on the compost, e.g. diazinon emulsion, etc. PC10. maintain hygiene by wearing clean clothes and shoes and wash hands before entering mushroom farms PC11. pasteurize the mushroom farm to remove nematode in mushroom cultivation PC12. treat the mushroom farms with small amount of caustic chemical to keep rodents away, e.g. zinc phosphate, etc. PC13. use fungicides to control major fungal pathogens, e.g. bavistin, etc.
	Prepare casing soil and pinning	The user/individual on the job should be able to: <ul style="list-style-type: none"> PC14. prepare casing soil to hold moisture for the development of a firm mushroom PC15. use freshly prepared spawn because the mycelium is in the state of active

AGR/N7815 Undertake disease control and pest management activities, casing and pinning for mushroom cultivation

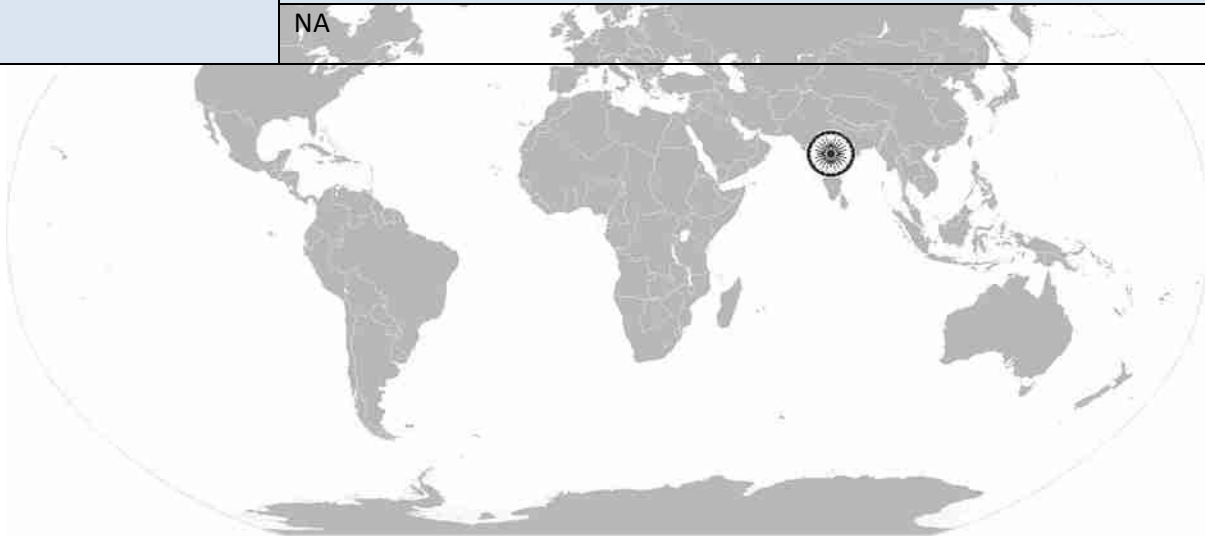
	<p>growth</p> <p>PC16. protect the compost from drying, and provide support for the developing mushrooms and resisting structural breakdown following repeated watering</p> <p>PC17. promote the formation of primordia, or mushroom pins by supplying water with a sprayer pump to the mycelium for growth and development</p> <p>PC18. maintain proper hygienic condition by wearing gloves and boots dipped in disinfectant while entering the mushroom farms for casing</p> <p>PC19. adjust compost temperature and relative humidity</p> <p>PC20. fertilize with nitrogen to increases yield of mushrooms</p> <p>PC21. maintain carbon dioxide concentration at a higher level to accelerate the growth of mushrooms</p> <p>PC22. apply water to casing in a few instalments so that water does not run into spawn run compost</p> <p>PC23. detect the earliest formation of recognizable mushrooms from mycelium</p> <p>PC24. case at a regular interval of three days after harvesting or cover the holes after mushroom picking</p> <p>PC25. pick the mushrooms daily</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant legislation, standards, policies, and procedures in mushroom cultivation</p> <p>KA2. relevant health and safety requirements applicable in mushrooms farms</p> <p>KA3. own job role and responsibilities and sources for information pertaining to mushroom cultivation</p> <p>KA4. who to approach for support in order to obtain work related information, clarifications and support</p> <p>KA5. importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and business</p> <p>KA6. relevant people and their responsibilities within the mushroom farm</p> <p>KA7. escalation matrix and procedures for reporting regulatory issues</p> <p>KA8. documentation and related procedures applicable in mushroom growing</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. threats to mushroom cultivation—diseases and pests</p> <p>KB2. casing—top-dressing applied to the spawn-run compost on which the mushroom grows</p> <p>KB3. limitation of chemical use for controlling diseases or pests in mushroom cultivation</p> <p>KB4. sanitation and strict hygiene are the most important preventive methods for pest and disease control.</p> <p>KB5. hazards and risks associated with mushroom collection and how to control injury to self</p> <p>KB6. water usage management</p> <p>KB7. various types of tools, equipment, materials and machineries used in</p>

AGR/N7815 Undertake disease control and pest management activities, casing and pinning for mushroom cultivation

	mushroom cultivation KB8. various kinds of chemicals used to treat diseased plants KB9. role of temperature, soil composition, relative humidity and cleanliness in mushroom farms KB10. how to control pests and insect infestation KB11. casing soil preparation from 2/3rd cow dung (3–4 years old), 1/3rd saline soil, rice husk and coco peat in order to hold moisture, essential for the development of a firm mushroom
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. record activities of pest management and disease control, etc. in logs, registers, etc. in English or local language SA2. fill details of expenditure incurred in pest management and casing materials, etc. in English or local language
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA3. read basic instructions and information in English or local language related to pest management and disease control SA4. read and interpret safety warnings, symbols, signs, etc. mentioned on tools, equipment and pesticides
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. communicate effectively with co-workers, subordinates, etc. SA6. seek clarification and understanding where instructions are not clear in any language understood locally SA7. follow instructions from responsible authority completely in order to avoid miscommunication or conflicts at work
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. decide on the appropriate casing time and agro-climatic condition of various types of mushrooms SB2. decide on the treatment for pest and disease control of mushrooms SB3. face difficult situation decisions seek clarification from responsible authority
	Plan and Organize
	The user/individual on the job needs to know and understand: SB4. work such that all activities are completed in time and as per standard quality procedures
	Customer Centricity

**AGR/N7815 Undertake disease control and pest management activities, casing and pinning
for mushroom cultivation**

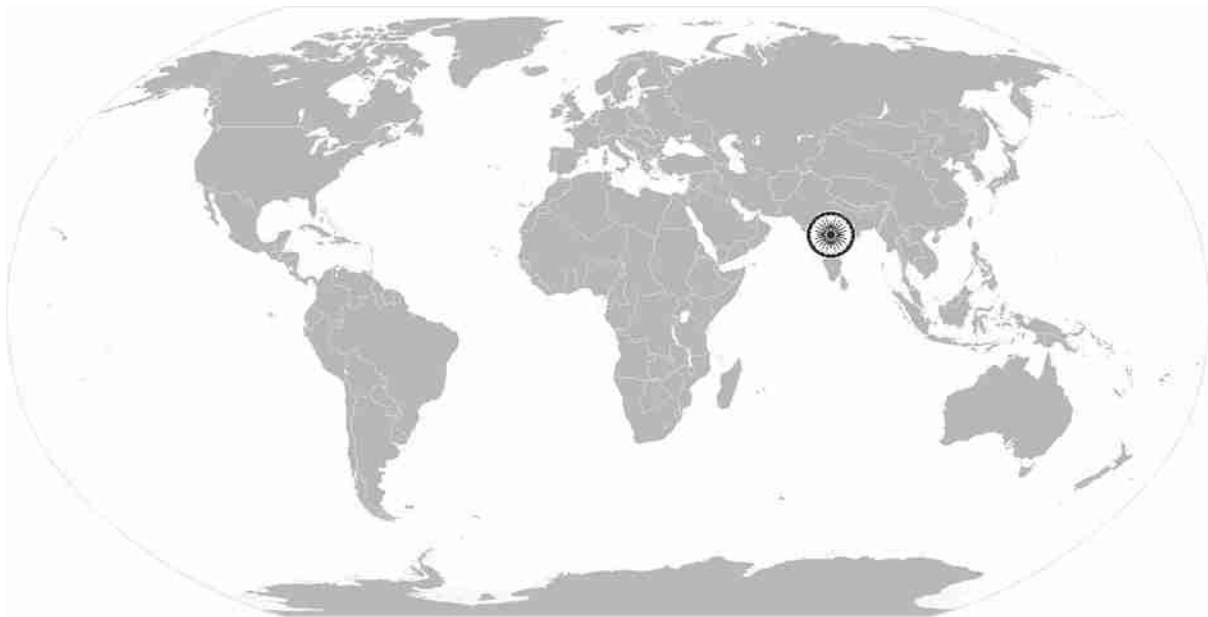
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB5. use customer demand as a key factor for production targets</p> <p>SB6. assess and meet customer satisfaction objectives to guide quality considerations at work</p> <p>SB7. present oneself and deal with customers in a professional and courteous manner</p>
	Problem Solving
	<p>The user/individual on the job needs to know and understand:</p> <p>SB8. work such that all activities are completed in time and as per standard quality procedures</p>
	Analytical Thinking
	NA
	Critical Thinking
	NA



AGR/N7815 Undertake disease control and pest management activities, casing and pinning for mushroom cultivation

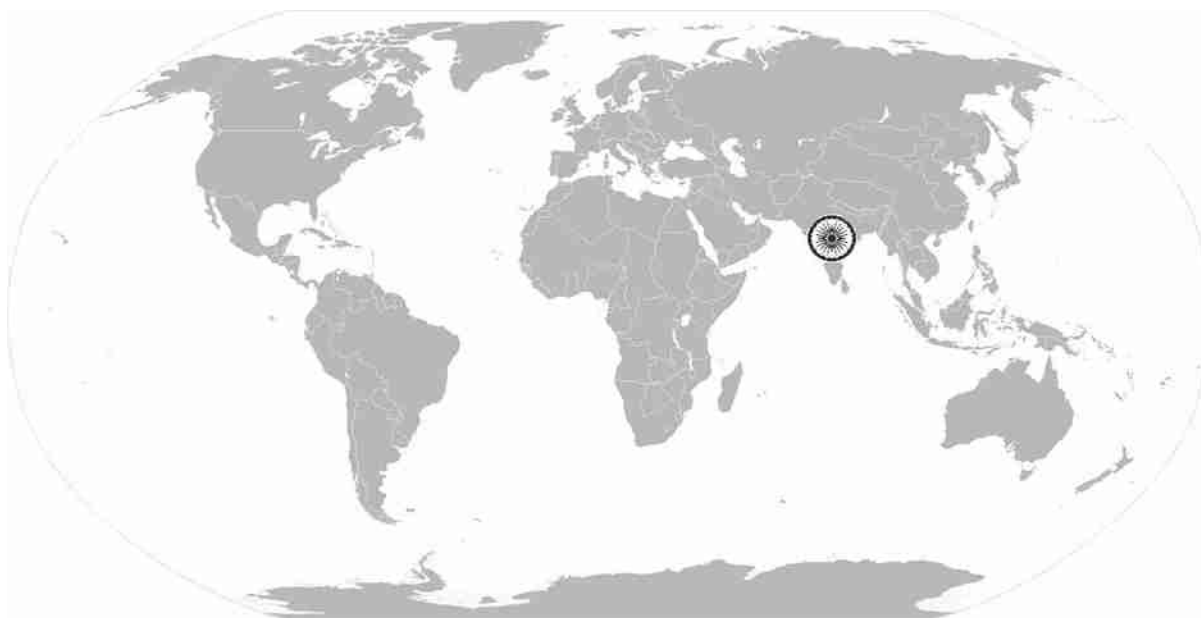
NOS Version Control

NOS Code	AGR/N7815		
Credits	TBD	Version number	1.0
Industry	Agriculture and Allied	Drafted on	31/01/16
Industry Sub-sector	Agriculture Industries	Last reviewed on	30/10/16
Occupation	Agri Entrepreneurship & Rural Enterprises	Next review date	30/10/19



AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms

National Occupational Standard



Overview

This unit refers to the skills and knowledge required by a mushroom grower to carry out harvesting and post-harvesting of mushrooms using approved harvesting practices.

AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms

National Occupational Standard	Unit Code	AGR/N7816
	Unit Title (Task)	Undertake harvest and post-harvest procedures of mushrooms
	Description	This OS unit mentions the range of learning outcomes required of a learner to competently carry out harvesting and post-harvesting procedures of mushroom.
	Scope	<p>This unit/task covers the following:</p> <ul style="list-style-type: none"> Identify the quality of mushrooms and methods of harvesting Cut, sort and dry harvested mushroom using approved procedures Store, pack and transport produce Post-harvest procedures and utilization of spent mushroom substrate
	Performance Criteria (PC) w.r.t. the Scope	
	Element	Performance Criteria
	Identify the quality of mushrooms and methods of harvesting	<p>The user/individual on the job should be able to:</p> <p>PC1. select mushrooms that are young and healthy</p> <p>PC2. assess the maturity of a mushroom by how far the veil is stretched respective of their types, and select mushrooms from medium- to large-size, e.g. For white button mushroom, cap size 30–40mm in diameter</p> <p>PC3. identify harvest periods, e.g. 3- to 5-day during the cropping cycle; followed by a few days when no mushrooms are available to harvest</p> <p>PC4. apply good harvesting practices, e.g. air temperature during cropping should be held between 14°C to 17°C and relative humidity should be high to minimize the drying of casing</p> <p>PC5. twist and pluck the mushrooms from its base by undertaking control measures to prevent contamination of the mushroom</p>
	Cut, sort and dry harvested mushroom using approved procedures	<p>The user/individual on the job should be able to:</p> <p>PC6. use approved cutting techniques for harvesting</p> <p>PC7. use approved cleaning methods to remove soil particles, compost, and other foreign materials, e.g. washing in water and sodium meta bisulphite solution</p> <p>PC8. remove the water content from the mushroom, as it is highly perishable</p> <p>PC9. sort and grade the harvests as per required quality specifications</p>
	Store, pack and transport produce	<p>The user/individual on the job should be able to:</p> <p>PC10. store freshly harvested mushrooms at lower temperature e.g. 2°C to 7°C</p> <p>PC11. select packaging material with respect to the shelf life, type of market where it is to be sold, and investment, e.g. non-waxed paper bag is used for prolong shelf life, tin cans for export, etc.</p> <p>PC12. identify packaging materials which is strong in nature, does not get contaminated easily, available abundantly, lucrative and attractive</p> <p>PC13. check the selected storage area is clean, well-ventilated and dry</p> <p>PC14. protect the storage area from direct sunlight, dust, rain, rodents, insects, and livestock, etc.</p>

AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms

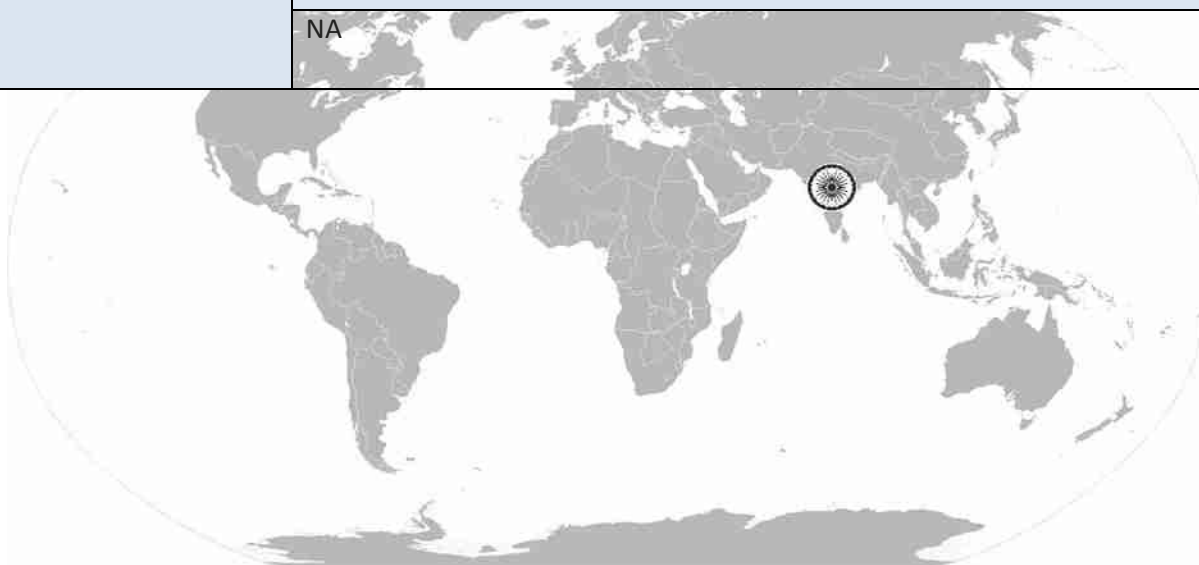
	<p>PC15. select the type of storage according to the shelf life of mushrooms—short-term and long-term</p> <p>PC16. pack the mushrooms in bags (usually polypropylene) of different capacities or perforated polythene pouches with 0.5 percent venting area or polystyrene/pulp-board punnets for sale</p> <p>PC17. transport precooled mushrooms in insulated ice containers internally lined with thermocole and covered with tin sheets on both the sides</p>
Post-harvest procedures and utilization of spent mushroom substrate	<p>The user/individual on the job should be able to:</p> <p>PC18. label the packed item correctly with all the required information Information: type of mushroom, month and year of harvest and the name of farmer/farming agency, etc.</p> <p>PC19. record information, e.g. quality, quantity, type, expenditure incurred in operation, etc. in appropriate registers, record book and logs</p> <p>PC20. use spent mushroom substrate in organic farming as it is rich in nutrient resources</p> <p>PC21. utilize spent mushroom substrate in vermicomposting and bioremediation of contaminated soil</p>
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. relevant legislation, standards, policies, and procedures related to mushroom farms</p> <p>KA2. relevant health and safety requirements applicable in mushroom farms</p> <p>KA3. own job role and responsibilities and sources for information pertaining to harvesting of mushrooms</p> <p>KA4. who to approach for support in order to obtain work related information, clarifications and support</p> <p>KA5. importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business</p> <p>KA6. relevant people and their responsibilities within the mushroom farm</p> <p>KA7. documentation and related procedures applicable to harvesting and post-harvesting of mushrooms</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. importance of appropriate personal protective equipment</p> <p>KB2. hazards and risks in the work environment and how to control injury to self and others</p> <p>KB3. relevant regulations in packaging and storage of mushrooms</p> <p>KB4. tools and materials used in harvesting, packaging, storage and transport of mushrooms</p> <p>KB5. various types of mushrooms and their methods of harvesting</p> <p>KB6. types of storage: Short-term: Pre-packing coupled with low temperature storage, irradiation and steeping preservation Long-term: Drying, freezing, freeze-drying, sun drying, slicing, blanching, canning, pickling and chemical treatment</p> <p>KB7. how to prevent contamination of mushrooms while harvesting, processing,</p>

AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms

	drying, storing and transporting KB8. good agricultural practices used in cultivation of mushrooms KB9. approved safe handling & transporting procedures KB10. different types of drying KB11. inference of traditional knowledge and practices KB12. importance and uses of spent mushroom substrate
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	The user/ individual on the job needs to know and understand how to: SA1. record activity schedules in harvesting, etc. in logs, registers, etc. in English or local language SA2. fill details of expenditure incurred, stock status of materials, tools and labour in harvest and post-harvest activities, etc. in English or local language
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA3. read basic instructions and information in English or local language related to work SA4. read and interpret safety warnings, symbols, signs, etc. mentioned on tools, equipment and materials
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. communicate effectively with co-workers, subordinates, etc. SA6. seek clarification and understanding where instructions are not clear in any language understood locally SA7. follow instructions from responsible authority completely in order to avoid miscommunication or conflicts at work
B. Professional Skills	Decision Making
	The user/individual on the job needs to know and understand how to: SB1. decide on the appropriate casing time and agro-climatic condition of various types of mushrooms SB2. decide on the treatment for pest and disease control of mushrooms SB3. face difficult situation and seek clarification from responsible authority
	Plan and Organize
	The user/individual on the job needs to know and understand: SB4. work such that all activities are completed in time and as per standard quality procedures
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB5. use customer demand as a key factor for production targets

AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms

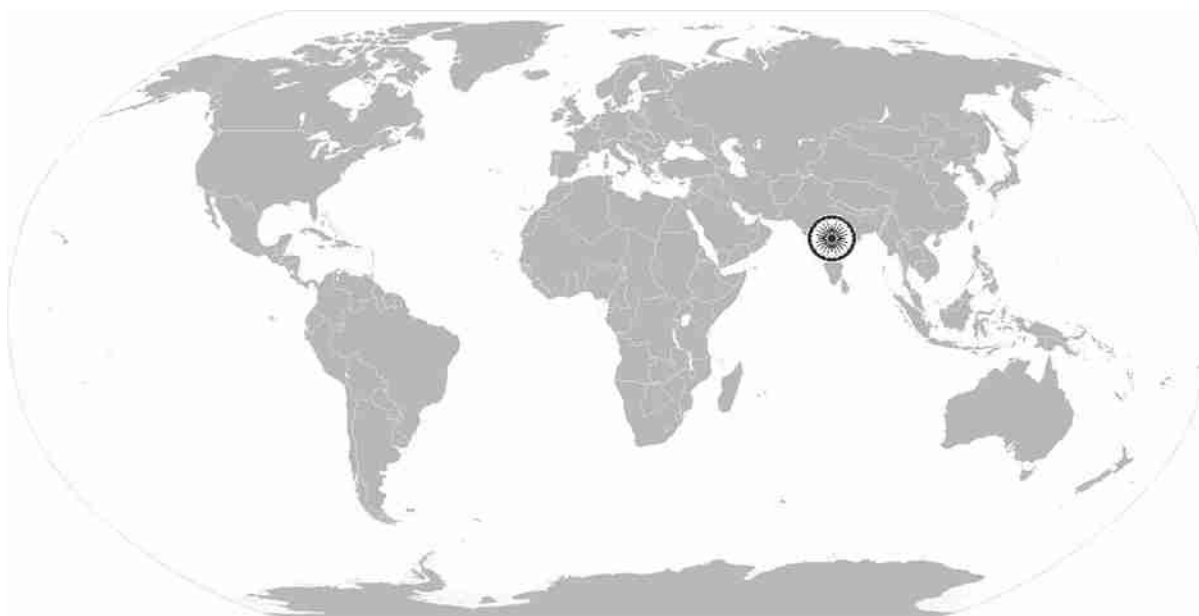
	SB6. assess and meet customer satisfaction objectives to guide quality considerations at work
	SB7. present oneself and deal with customers in a professional and courteous manner
	SB8. ensure customer receives a fair deal in business transactions with the organisation
	Problem Solving
	NA
	Analytical Thinking
	NA
	Critical Thinking
	NA



AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms

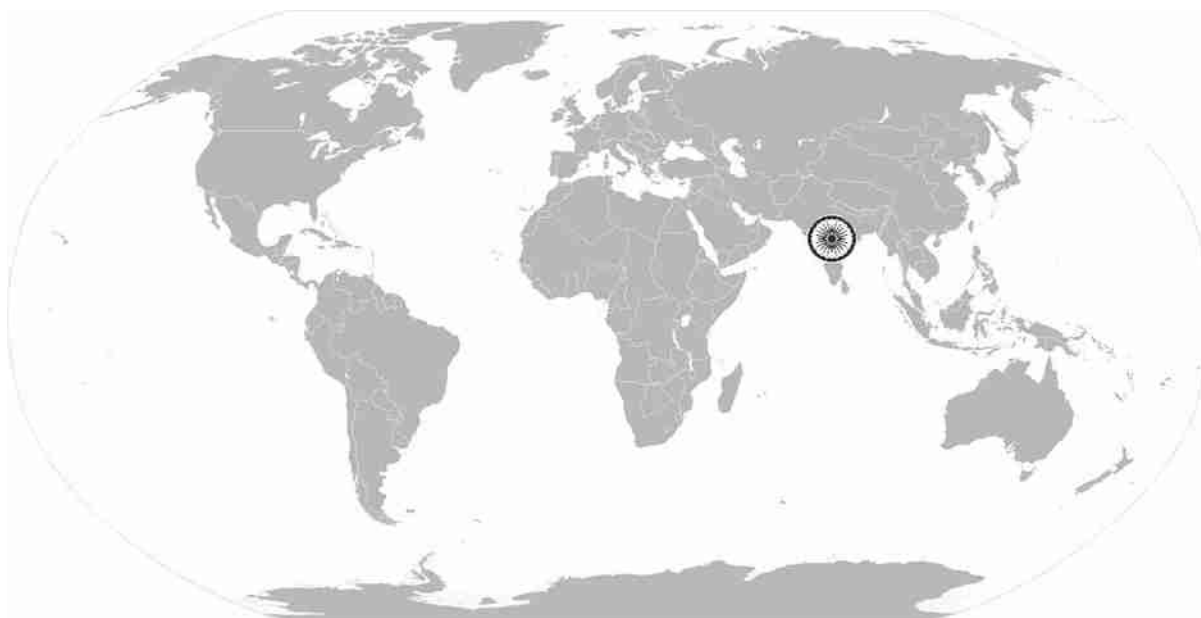
NOS Version Control

NOS Code	AGR/N7816		
Credits	TBD	Version number	1.0
Industry	Agriculture and Allied	Drafted on	31/01/16
Industry Sub-sector	Agriculture Industries	Last reviewed on	30/10/16
Occupation	Agri Entrepreneurship & Rural Enterprises	Next review date	30/10/19



AGR/N9908 Undertake basic entrepreneurial activities for small enterprise

National Occupational Standard



Overview

This unit refers to trading skills and knowledge recommended for small entrepreneur to market and sell produces.

AGR/N9908 Undertake basic entrepreneurial activities for small enterprise

National Occupational Standard

Unit Code	AGR/N9908
Unit Title (Task)	Undertake basic entrepreneurial activities for small enterprise
Description	The OS unit deals with the job duties of small entrepreneur and how to undertake basic entrepreneurial activities.
Scope	This unit/task covers the following: <ul style="list-style-type: none"> Undertake basic small entrepreneurial activities
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Undertake basic small entrepreneurial activities	The user/individual on the job should be able to: <ul style="list-style-type: none"> PC1. seek information regarding demand and supply of produce in the market PC2. identify target customers and assess their needs such as amount required, purpose, quality, expectations, etc. PC3. perform basic accounting such calculating expenditure incurred, costing and pricing of produce PC4. ensure that the cost of production, transportation and marketing are included in costing and pricing PC5. collect information related to various subsidies/funds offered by the Government, authorized state units and other financial institutions involved with the promotion of the produce PC6. comply with relevant regulations in marketing of the produce PC7. track information related to wholesale and retail price of the produce PC8. record daily sell and purchase of items in designated log books, register, etc. PC9. record quantity, quality, date of manufacture and batch number of every produce accurately PC10. identify appropriate marketing channels related to the produce considering requirements and constraints
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: <ul style="list-style-type: none"> KA1. relevant legislation, standards, policies, and procedures related to the produce KA2. relevant health and safety requirements applicable in the enterprise KA3. own job role and responsibilities and sources for information pertaining to marketing of produce KA4. who to approach for support in order to obtain market related information and clarifications KA5. importance of following health, hygiene, safety and quality standards and the impact of not following the standards on consumers and the business KA6. relevant people and their responsibilities within the market KA7. escalation matrix and procedures for reporting regulatory issues KA8. documentation and related procedures applicable in the context of work

AGR/N9908 Undertake basic entrepreneurial activities for small enterprise

B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. basic accounting such calculating expenditure incurred, total cost of production</p> <p>KB2. how to determine market value of the produce</p> <p>KB3. relevant regulations related to marketing and sale of the produce</p> <p>KB4. various trading channels of produce and their margin of profit</p> <p>KB5. various subsidies/funds offered by the Government, authorized state units and other financial institutions involved with the promotion and sale of produce</p> <p>KB6. strategies for choosing and exploiting marketing channels related to the produce such as retailers, farms, vendors, whole-sellers (mandi), related companies, marketing associations, cold storage owners, exporters, etc.</p>
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. record marketing activities, schedules, etc. in logs, registers, etc. in English or local language</p> <p>SA2. fill details of expenditure incurred, stock status of material, monthly sales and distribution, etc. in English or local language</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. read basic instructions and information in English or local language related to entrepreneurial activities</p>
	Oral Communication (Listening and Speaking skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. communicate effectively with co-workers, subordinates, customers, exporters, etc.</p> <p>SA5. seek clarification and understanding where instructions are not clear in any language understood locally</p> <p>SA6. follow instructions from responsible authority completely in order to avoid miscommunication or conflicts at work</p>
B. Professional Skills	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. seek clarification from responsible authority when faced with difficult decisions</p>
	Plan and Organize
	<p>The user/individual on the job needs to know and understand, how to:</p> <p>SB2. all activities necessary for the marketing and selling of the produces are completed in time and as per standard quality procedures</p>

AGR/N9908 Undertake basic entrepreneurial activities for small enterprise

	Customer Centricity
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB3. use customer demand as a key factor for production targets</p> <p>SB4. assess and meet customer satisfaction objectives to guide quality considerations at work</p> <p>SB5. present oneself and deal with customers in a professional and courteous manner</p> <p>SB6. ensure customer receives a fair deal in business transactions with the organisation</p>
	Problem Solving
	NA
	Analytical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB7. analyze right timing to market the main product and by-products</p> <p>SB8. prepare plan to get right price of product without compromising the quality of product and by-products</p> <p>SB9. identify the cost effective marketing channels related to produce considering requirements and constraints</p>
	Critical Thinking
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB10. evaluate the demand and supply gaps related to product</p> <p>SB11. Identify target customers whose needs can be serviced at mutually acceptable price and quality</p>

AGR/N9908 Undertake basic entrepreneurial activities for small enterprise

NOS Version Control

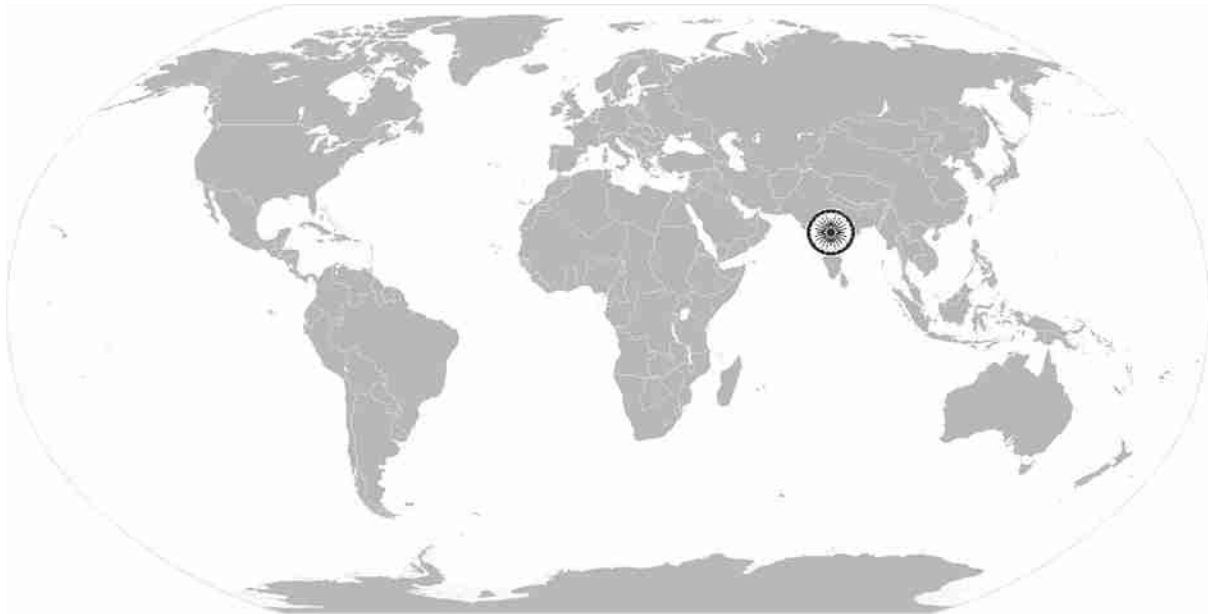
NOS Code	AGR/N9908		
Credits	TBD	Version number	1.0
Industry	Agriculture and Allied	Drafted on	31/01/16
Industry Sub-sector	Agriculture allied activity; Agriculture Crop Production; Forestry, Environment and Renewable Energy Management; Agriculture Industries; Generic Occupations	Last reviewed on	30/10/16
Occupation	Generic	Next review date	30/10/19



AGR/N9903

Maintain health & safety at the workplace

National Occupational Standard



Overview


This unit is about dealing with health and safety of the farmers and coworkers at workplace.

AGR/N9903
Maintain health & safety at the workplace

National Occupational Standard

Unit Code	AGR/N9903
Unit Title (Task)	Maintain health & safety at the workplace
Description	This OS is for the cultivator who is responsible for maintaining health and safety of self and others coworkers at workplace
Scope	This unit/task covers the following: <ul style="list-style-type: none"> • Maintain clean and efficient workplace • Render appropriate emergency procedures
Performance Criteria (PC) w.r.t. the Scope	
Element	Performance Criteria
Maintaining clean and efficient workplace	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC1. undertake basic safety checks before operation of all machinery and vehicles and hazards are reported to the 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 PC3. read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants etc PC4. assess risks prior to performing manual handling jobs, and work according to currently recommended safe practice. PC5. use equipment and materials safely and correctly and return the same to designated storage when not in use PC6. dispose of waste safely and correctly in a designated area PC7. recognize risks to bystanders and take action to reduce risk associated with jobs in the workplace PC8. perform your work in a manner which minimizes environmental damage all procedures and work instructions for controlling risk are followed closely PC9. report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger
Render appropriate emergency procedures	To be competent, the user/individual on the job must be able to: <ul style="list-style-type: none"> PC10. follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to emergency PC11. follow emergency procedures to company standard / workplace requirements PC12. use emergency equipment in accordance with manufacturers' specifications and workplace requirements PC13. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques PC14. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate

AGR/N9903
Maintain health & safety at the workplace

	PC15. report details of first aid administered in accordance with workplace procedures
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	<p>The user/individual on the job needs to know and understand:</p> <p>KA1. personal hygiene and fitness requirements</p> <p>KA2. your general duties under the relevant health and safety legislation</p> <p>KA3. what personal protective equipment and clothing should be worn and how it is cared for</p> <p>KA4. the correct and safe way to use materials and equipment required for your work</p> <p>KA5. the importance of good housekeeping in the workplace</p> <p>KA6. safe disposal methods for waste</p> <p>KA7. methods for minimizing environmental damage during work</p>
B. Technical Knowledge	<p>The user/individual on the job needs to know and understand:</p> <p>KB1. the risks to health and safety and the measures to be taken to control those risks in your area of work</p> <p>KB2. workplace procedures and requirements for the treatment of workplace injuries/illnesses</p> <p>KB3. basic emergency first aid procedure </p> <p>KB4. local emergency services</p> <p>KB5. why accidents, incidents and problems should be reported and the appropriate action to take</p>
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The user/ individual on the job needs to know and understand how to:</p> <p>SA1. mention the data which are required for record keeping purpose</p> <p>SA2. report problems to the appropriate personnel in a timely manner, write descriptions and details about incidents in reports</p>
	Reading Skills
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA3. read instruction manual for hand tool and equipment</p>
	Oral Communication (Listening and Speaking Skills)
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SA4. communicate clearly and effectively with others like farmers, concerned officer/stakeholders</p> <p>SA5. comprehends information shared by senior people and experts</p>
B. Professional Skills	Decision Making
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. make decisions pertaining to types of tools to be used identify need of first aid and render it accordingly</p>

AGR/N9903
Maintain health & safety at the workplace

	Plan and Organize
	The user/individual on the job needs to know and understand how to: SB2. schedule daily activities and drawing up priorities; allocate start times, estimation of completion times and materials, equipment and assistance required for completion
	Customer Centricity
	The user/individual on the job needs to know and understand how to: SB3. manage relationships with co-workers and managers of who may be stressed, frustrated, confused or angry
	Problem Solving
	The user/individual on the job needs to know and understand how to: SB4. think through the problem, evaluate the possible solution(s) and suggest an optimum /best possible solution(s) SB5. deal with clients lacking the technical background to solve the problem on their own SB6. identify immediate or temporary solutions to resolve delays
	Analytical Thinking
	NA
	Critical Thinking
	The user/individual on the job needs to know and understand how to: SB7. Identify risks and hazards at the workplace SB8. evaluate the available safety and health measures to check if they are ready for use

AGR/N9903

Maintain health & safety at the workplace

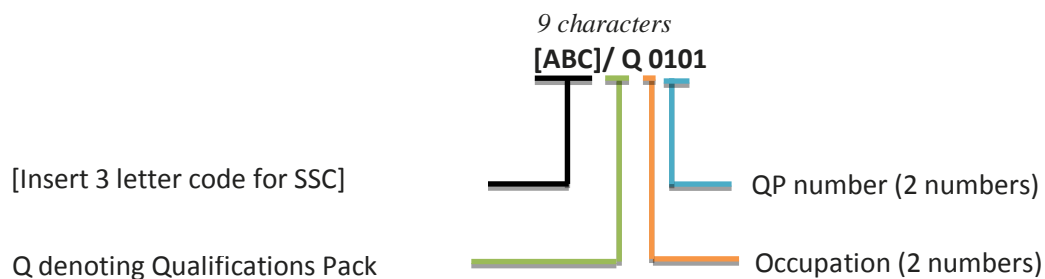
NOS Version Control

NOS Code	AGR/N9903		
Credits	TBD	Version number	1.0
Industry	Agriculture and Allied	Drafted on	31/01/16
Industry Sub-sector	Agriculture allied activity; Agriculture Crop Production; Forestry, Environment and Renewable Energy Management; Agriculture Industries; Generic Occupations	Last reviewed on	30/10/16
Occupation	Generic	Next review date	30/10/19

Annexure

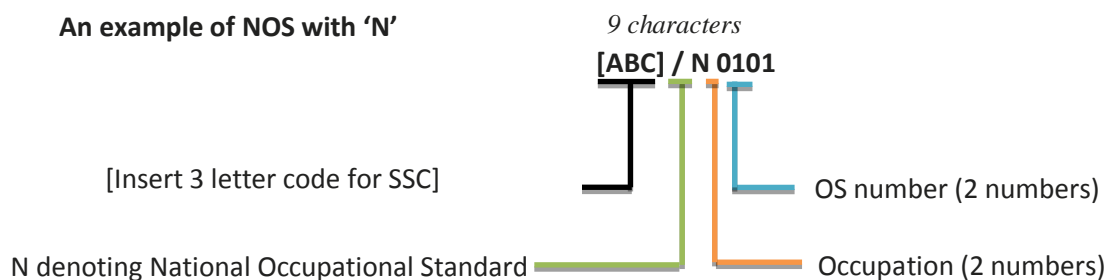
Nomenclature for QP and NOS

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Agriculture Crop Production	01 – 40
Dairying	41 – 42
Poultry	43 – 44
Animal Husbandry	45 – 48
Fisheries	49 – 51
Agriculture Allied Activities	52 – 60
Forestry, Environment and Renewable Energy Management	61 - 70
Agriculture Industries	71 – 90
Generic Occupations	96 - 99

Sequence	Description	Example
Three letters	Agriculture	AGR
Slash	/	/
Next letter	Whether QP or NOS	N
Next two numbers	Occupation code	01
Next two numbers	OS number	01

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role: Mushroom Grower

Qualification Pack: AGR/Q7803

Sector Skill Council: Agriculture Skill Council of India

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 center (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. 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	Theroy	Practical Skills
1. AGR/N7813 Prepare and pasteurize the compost necessary to cultivate mushrooms	PC1. identify different types of base materials from various agricultural by-products, e.g. freshly harvested paddy straw, wheat straw, mustard straw, etc.	100	10	5	5
	PC2. select materials which acts as a reservoir of cellulose, hemi-cellulose and lignin, and is utilized by the mushroom species during its growth as a carbon source		10	5	5
	PC3. identify materials that have nitrogen (N) and carbon (C) ratio 1: 10 for the establishment of the bacterial flora in the compost		6	3	3
	PC4. select materials that acts as a nutrient source, impart proper physical structure to the substrate, ensure adequate aeration during composting, and add bulk to the compost		6	3	3
	PC5. select chemicals for rectifying the mineral deficiencies in the compost such as muriate of potash, super phosphate, urea, calcium ammonium nitrate, ammonium sulphate, etc.		6	3	3

PC6. identify chemicals which has a stabilizing effect on ammonium content, serves as a calcium source for the mushroom and also for the oxalic acid produced by the mushroom mycelium, which gets converted into calcium oxalate, e.g. gypsum and calcium carbonate		6	3	3
PC7. select the necessary tools required to produce a compost		4	2	2
PC8. compute different formulations of composting ingredients to achieve the required nitrogen and carbon ratio for mushroom compost		6	3	3
PC9. identify the types of compost—Natural and synthetic		4	2	2
PC10. select the method of composting with respect to the availability of steam pasteurization		4	2	2
PC11. ensure to sprinkle water over the compost regularly after an interval of a day		3	1	2
PC12. rotate the compost after an interval of 2–3 days regularly to allow gas exchange, adequate moisture, and carbohydrates throughout the process		4	2	2
PC13. store the agricultural by-products under cover to minimize growth of unwanted and potentially detrimental fungi and bacteria		3	1	2
PC14. pasteurize the compost to kill insects, nematodes, pest fungi, or other pests		4	2	2
PC15. identify the attributes of a good compost—dark brown in colour, non-greasy, inoffensive sweet smell, ammonia free, no insects and nematodes		5	2	3
PC16. leave the work in a safe condition		3	0	3
PC17. return used tools and materials in appropriate storage area		3	0	3
PC18. dispose wastes materials in accordance with environmental health & safety guidelines		5	2	3
PC19. report any work related problems or issues to responsible authority and seek guidance on how to rectify problems		4	2	2
PC20. exercise safe handling practices while handling sharp tools and equipment		4	2	2
	Total	100	45	55

2. AGR/N7814 Select commercially important species of mushroom and design appropriate site to cultivate mushrooms	PC1. select the type of mushroom based on market's demand, climatic conditions of the farm, growing season, investments, etc.	100	10	5	5
	PC2. collect mushroom spawns from reliable sources, e.g. nearest Krishi Vigyan Kendra (KVK), etc.		10	5	5
	PC3. select species which will be cost effective and economically beneficial according to market research		10	5	5
	PC4. identify the type of mushroom with more shelf life as per industry standard		10	5	5
	PC5. select freshly prepared spawns because the mycelium is in the state of active growth		6	3	3
	PC6. undertake site assessment		4	2	2
	PC7. locate site easily accessible by main roads and pathways		4	2	2
	PC8. ensure that the site is deprived of sunlight		6	3	3
	PC9. ensure proper drainage of rain water		6	3	3
	PC10. prepare and check the suitability of design and layout of the farm according to the growing conditions required for different kinds of mushrooms		8	4	4
	PC11. ensure availability of fresh water supply for the mushroom growing facility		6	3	3
	PC12. ensure effective underground drainage system or gutters for carrying out waste water		6	3	3
	PC13. use safe and reliable construction techniques to build required fixtures for mushroom growing		6	3	3
	PC14. use crop rotation method for mushroom cultivation		8	4	4
	Total		100	50	50
3. AGR/N7815 Undertake disease control and pest management activities, casing and pinning for mushroom cultivation	PC1. ensure substrates are not exposed to pathogens or pests during spawning	100	4	2	2
	PC2. inspect mushroom bags or beds carefully for early detection of pests and diseases		4	2	2
	PC3. ensure that flies do not enter the mushroom farms, e.g. not dumping any waste near mushroom farms, installing screens on windows and doors, etc.		4	2	2
	PC4. use sterilized casing soil, proper disposal of spent compost to control nematodes, mites, insect pests, etc.		4	2	2

PC5. spray fungicide after casing to check dry bubble, e.g. dithane Z-78, sporgon, topsin M, chlorothalonil, prochloraz, daconil, etc.	4	2	2
PC6. control local infections by spraying the affected patch with commercial formalin	4	2	2
PC7. spray chlorinated water to manage bacterial diseases	4	2	2
PC8. disinfest mushroom farms by spraying pesticide as a prophylactic measure, e.g. dicofol, etc.	4	2	2
PC9. control mites by spraying insecticide on the compost, e.g. diazinon emulsion, etc.	4	2	2
PC10. maintain hygiene by wearing clean clothes and shoes and wash hands before entering mushroom farms	4	2	2
PC11. pasteurize the mushroom farm to remove nematode in mushroom cultivation	4	2	2
PC12. treat the mushroom farms with small amount of caustic chemical to keep rodents away, e.g. zinc phosphate, etc.	4	2	2
PC13. use fungicides to control major fungal pathogens, e.g. bavistin, etc.	4	2	2
PC14. prepare casing soil to hold moisture for the development of a firm mushroom	4	2	2
PC15. use freshly prepared spawn because the mycelium is in the state of active growth	4	2	2
PC16. protect the compost from drying, and provide support for the developing mushrooms and resisting structural breakdown following repeated watering	4	2	2
PC17. promote the formation of primordia, or mushroom pins by supplying water with a sprayer pump to the mycelium for growth and development	4	2	2
PC18. maintain proper hygienic condition by wearing gloves and boots dipped in disinfectant while entering the mushroom farms for casing	4	2	2
PC19. adjust compost temperature and relative humidity	4	2	2
PC20. fertilize with nitrogen to increases yield of mushrooms	4	2	2

	PC21. maintain carbon dioxide concentration at a higher level to accelerate the growth of mushrooms		4	2	2
	PC22. apply water to casing in a few instalments so that water does not run into spawn run compost		4	2	2
	PC23. detect the earliest formation of recognizable mushrooms from mycelium		4	2	2
	PC24. case at a regular interval of three days after harvesting or cover the holes after mushroom picking		4	2	2
	PC25. pick the mushrooms daily		4	2	2
		Total	100	50	50
4. AGR/N7816 Undertake harvest and post-harvest procedures of mushrooms	PC1. select mushrooms that are young and healthy	100	8	4	4
	PC2. assess the maturity of a mushroom by how far the veil is stretched respective of their types, and select mushrooms from medium- to large-size,		8	4	4
	PC3. identify harvest periods		8	4	4
	PC4. apply good harvesting practices, e.g. air temperature during cropping should be held between 14°C to 17°C and relative humidity should be high to minimize the drying of casing		4	2	2
	PC5. twist and pluck the mushrooms from its base by undertaking control measures to prevent contamination of the mushroom		4	2	2
	PC6. use approved cutting techniques for harvesting		4	2	2
	PC7. use approved cleaning methods to remove soil particles, compost, and other foreign materials, e.g. washing in water and sodium meta bisulphite solution		4	2	2
	PC8. remove the water content from the mushroom, as it is highly perishable		6	3	3
	PC9. sort and grade the harvests as per required quality specifications		5	2	3
	PC10. store freshly harvested mushrooms at lower temperature e.g. 2°C to 7°C		4	2	2

	PC11. select packaging material with respect to the shelf life, type of market where it is to be sold, and investment		4	2	2
	PC12. identify packaging materials which is strong in nature, does not get contaminated easily, available abundantly, lucrative and attractive		3	1	2
	PC13. check the selected storage area is clean, well-ventilated and dry		4	2	2
	PC14. protect the storage area from direct sunlight, dust, rain, rodents, insects, and livestock, etc.		4	2	2
	PC15. select the type of storage according to the shelf life of mushrooms—short-term and long-term		4	2	2
	PC16. pack the mushrooms in bags (usually polypropylene) of different capacities or perforated polythene pouches with 0.5 percent venting area or polystyrene/pulp-board punnets for sale		4	2	2
	PC17. transport precooled mushrooms in insulated ice containers internally lined with thermocole and covered with tin sheets on both the sides		3	1	2
	PC18. label the packed item correctly with all the required information		3	1	2
	PC19. record information, e.g. quality, quantity, type, expenditure incurred in operation, etc. in appropriate registers, record book and logs		5	1	4
	PC20. use spent mushroom substrate in organic farming as it is rich in nutrient resources		5	1	4
	PC21. utilize spent mushroom substrate in vermicomposting and bioremediation of contaminated soil		6	3	3
		Total	100	45	55
5. AGR/N9908 Undertake basic entrepreneurial	PC1. seek information regarding demand and supply of produce in the market	100	10	5	5
	PC2. identify target customers and assess their needs such as amount required, purpose, quality, expectations, etc.		10	5	5

activities for small enterprise	PC3. perform basic accounting such calculating expenditure incurred, costing and pricing of produce		10	5	5
	PC4. ensure that the cost of production, transportation and marketing are included in costing and pricing		10	5	5
	PC5. collect information related to various subsidies/funds offered by the Government, authorized state units and other financial institutions involved with the promotion of the produce		10	5	5
	PC6. comply with relevant regulations in marketing of the produce		10	5	5
	PC7. track information related to wholesale and retail price of the produce		10	5	5
	PC8. record daily sell and purchase of items in designated log books, register, etc.		10	5	5
	PC9. record quantity, quality, date of manufacture and batch number of every produce accurately		10	5	5
	PC10. identify appropriate marketing channels related to the produce considering requirements and constraints		10	5	5
			10	5	5
		Total	100	50	50
6. AGR/N9903 Maintain health & safety at the workplace	PC1. undertake basic safety checks before operation of all machinery and vehicles and hazards are reported to the appropriate supervisor	100	8	4	4
	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		8	4	4
	PC3. read and understand the hazards of use and contamination mentioned on the labels of pesticides/fumigants etc		8	4	4
	PC4. assess risks prior to performing manual handling jobs, and work according to currently recommended safe practice		8	4	4
	PC5. use equipment and materials safely and correctly and return the same to designated storage when not in use		8	4	4
	PC6. dispose of waste safely and correctly in a designated area		6	3	3

	PC7. recognize risks to bystanders and take action to reduce risk associated with jobs in the workplace		6	3	3
	PC8. perform your work in a manner which minimizes environmental damage all procedures and work instructions for controlling risk are followed closely		6	3	3
	PC9. report any accidents, incidents or problems without delay to an appropriate person and take necessary immediate action to reduce further danger		6	3	3
	PC10. follow procedures for dealing with accidents, fires and emergencies, including communicating location and directions to emergency		6	3	3
	PC11. follow emergency procedures to company standard / workplace requirements		6	3	3
	PC12. use emergency equipment in accordance with manufacturers' specifications and workplace requirements		6	3	3
	PC13. provide treatment appropriate to the patient's injuries in accordance with recognized first aid techniques		6	3	3
	PC14. recover (if practical), clean, inspect/test, refurbish, replace and store the first aid equipment as appropriate		6	3	3
	PC15. report details of first aid administered in accordance with workplace procedures		6	3	3
		Total	100	50	50
	GRAND TOTAL	600	600	290	310