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**ASCI**  
Agriculture Skill Council of India

# Facilitator Guide



Sector  
**Agriculture**

Sub-Sector  
**Agriculture Industries**

Occupation  
**Agriculture Entrepreneurship & Rural Enterprises**

Reference ID: **AGR/Q7803**, Version **3.0**  
NSQF Level: **4**

## Mushroom Grower (Entrepreneur)



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## Published by

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**Shri Narendra Modi**

Prime Minister of India

“ Skilling is building a better India.  
If we have to move India towards  
development then Skill Development  
should be our mission. ”



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It is expected that this publication would meet the complete requirements of QP/NOS based training delivery. We welcome the suggestions from users, industry experts and other stakeholders for any improvement in future.

## About this Guide

The objective of the guide is to provide an approach map for interacting with the trainees undergoing training on this job role. The aim of the course is to provide both theoretical and practical knowledge to the trainees, and also to guide them for marketing the product and generating income. The guide is neither a substitute nor complete road map, but an aid to help to pass on the knowledge on all the aspects to the trainees in a systematic manner. It is expected that the trainer is fully conversant with all the contents of the guide. The guide is just to indicate that how to proceed for covering a topic and includes some additional information that may be necessary for the trainer to develop better comprehension on following aspects:

- **Knowledge and Understanding:** Satisfactory operational learning and comprehension to play out the required chore.
- **Performance Criteria:** Pick up the required aptitudes through hands on preparing and play out the required operations inside the predetermined measures.
- **Professional Skills:** Capacity to settle on operational choices relating to the zone of work.

The job will also include judging the comprehension and also help them learn more by hands on training. But it has to be ensured that these are in accordance with the knowledge imparted and time spent on each unit. It is expected that irrespective of the region, knowledge on all aspects will be imparted to trainees.

## Symbols Used



Ask



Activity



Do



Demonstrate



Explain



Elaborate



Example



Exercise



Facilitation Notes



Field Visit



Learning Outcomes



Notes



Objectives



Practical



Resources



Team Activity



Summarize



Say

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# 1. Introduction to the Role of a Mushroom Grower (Entrepreneur)

Unit 1.1 - Introduction to Mushrooms

Unit 1.2 - History of Mushroom Cultivation and Global Scenario

Unit 1.3 - Different Types of Mushrooms Under Cultivation in India

Unit 1.4 - Some Basic Terms and Equipment Used in Mushroom Cultivation

Unit 1.5 - Steps in Mushroom Cultivation: Spawn-Compost-Cropping-Marketing



**Bridge Module**

## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. Describe the size and scope of the Agriculture industry and its subsectors.
2. Discuss the role and responsibilities of a Mushroom Grower/ Entrepreneur.
3. Identify various employment/entrepreneurship opportunities for a Mushroom Grower/ Entrepreneur..
4. Discuss economics of mushroom cultivation
5. Discuss Basic Concepts and characteristics of Entrepreneurship

## UNIT 1.1: Introduction to Mushrooms

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Discuss about mushroom and their different types in the world.
2. Recall whether mushrooms are plants or animals.
3. Identify the benefits of growing of mushrooms to the farmers and environment.
4. Describe about advantages of consuming mushrooms as a health food.
5. Recognise the medicinal benefits of consuming mushrooms.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images e.g. various types, mushroom as food, and its medicinal uses.

### Say

Initiate with formal introduction and ask about the name, place, experience in mushrooms if any, qualifications and expectations from the course. After that introduce yourself and other faculty and provide brief of the course.

### Ask

Ask questions at the beginning of the lecture to judge the level of knowledge and generate interest through interaction and exchange of knowledge among the trainees. Some of them could be-

- How many types of mushrooms you have seen in the market?
- Have you seen mushrooms appearing just after rains? Are all of these edible?
- What do you understand by the word Fungi?
- How many of you have seen the mould on the bread?
- Do you know that mushroom is also a type of fungus?
- Do you know that the bread, wine and many other foods are made using the fungus called yeast?
- Do you think that all fungi are useful or there are any harmful fungi?
- Do you know that antibiotic penicillin and many others were derived from fungi?
- Why you want to grow mushrooms?
- Why people eat mushrooms?
- How many dishes of mushrooms you have eaten?

## Say

Deliver the salient points of contents of the lecture as per handbook. While doing so, explain the basic terms so that trainees can follow what is being delivered and are in a better position to understand when they read the book.

### Cover the following aspects

- Mushrooms are fruit bodies of fungi.
- There are about 1.5 million fungi on earth out of which about 200 have been experimentally cultivated and 10 are cultivated on commercial scale.
- Mushrooms provide quality food, have medicinal value and help us to recycle agro wastes.
- Mushrooms are source of quality protein, low in fat and sodium rich in fibre, vitamins and minerals and the only vegetable source of Vitamin D.

## Do

- Wherever feasible, try to educate the trainees through pictures/models/charts/videos.

## Any Doubts

- Question Answers session: It is always better to give time for clearing doubts at the end of the unit, if any.
- Always encourage the trainees to ask questions and if time permits, try to summarize the lecture of the day by telling that what we have learnt today.

## Notes for Facilitation

1. Ask few simple questions at the end of lecture based on what has been taught. This may help you to understand the amount of matter comprehended by the trainees and accordingly will help you to amend the further interactions.
2. Refer to the relevant e-content and a blended learning will help to grasp the concept.
3. You may refer to the free learning resources available at skill India portal.
4. Equip yourself with supplementary reading and reference material. Some of them are shared as under:

### Fungi in our daily life

- As disease causing organisms
- As food - mushrooms
- Baking and brewing - bread and wine
- Antibiotics ; Penicillin in 1940s
- Cyclosporins - immunosuppressants during transplant
- Lovastatin - inhibit cholesterol synthesis
- Medicinal mushrooms: lentinus, Ganoderma

- Poisons and hallucinogens - mushrooms
- Pest-control; Trichoderma, Metarhizium, etc.
- Bioremediation: white rot fungi degrade pesticides
- Industrial chemicals like citric, lactic, malic acids, etc.
- Industrial enzymes such as lipases in detergent; cellulases for marking stone washed Jeans
- Mycotoxins; Ergot alkaloids from *Claviceps*; aflatoxins from *Aspergillus* spp.

## Exercise

### Key Solutions to PHB Exercises

1. Mushrooms do not have chlorophyll nor these are plants
2. Button, Shiitake, Oyster mushroom, wood ear mushroom, paddy straw mushroom, winter mushroom
3. Correct order of names corresponding with the pictures is e (Paddy straw mushroom), g (milky mushroom), b (oyster mushroom), a (shiitake), d (wood ear mushroom), c (button mushroom), and f (winter mushroom)
4. Utilisation of Agrowaste, quality food production
5. Vitamin D

## UNIT 1.2: History of Mushroom Cultivation and Global Scenario

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Recall when humans started experimenting with cultivation of mushrooms.
2. Discuss when actual cultivation started on scientific lines.
3. Describe the mushroom cultivation started attaining commercial scale.
4. Explain the species under cultivation in different parts at early stages and in last few decades.
5. Explain when mushroom cultivation started in India, and the different species under cultivation in our country.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images e.g. mushroom cultivation on commercial scale and different species under cultivation in our country.

### Ask

Ask the following questions to the participants:

- What do you know about the history of mushroom cultivation?
- Can you name some species of mushroom? Discuss the answers and start teaching session.

### Say

- Commercial cultivation of mushrooms is a new phenomenon and it was after World War II that mushroom cultivation picked up in some countries like USA, Europe, Japan, etc.
- Six types of mushroom account for 90% of world mushroom production. Highlight that button mushroom was the leading mushroom in last century but now it ranks third.
- At present, China accounts for about 87% of the world mushroom production.

### Elaborate

Explain the following topics with the help of participant handbook and audio visual aids:

- Mushroom cultivation before 20th century
- Global Scenario of mushroom cultivation
- Relative contribution of mushroom in different countries

## Activity

With the help of few videos and pictures, show the following on the projector:

- ✓ Global scenario of world mushroom production.
- ✓ Relative contribution of mushroom in different countries.
- ✓ Relative contribution of different species.
- ✓ Current scenario of mushroom production in India.
- Motivate students to engage in the video/picture session.
- Conduct a question answer session at the end of the video session.
- Answer each questions individually.
- Appreciate the students who were actively asking questions.

## Say

- I hope you all enjoyed the session. It will help you to understand the topic better.

## Notes for Facilitation

- Prepare some charts/ flip charts on mushroom cultivation history.
- Arrange some visuals of different species cultivated in India.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Encourage peer learning among participants in the class by answering other participant's questions.

## Exercise

### Key Solutions to PHB Exercises

1. Button, Shiitake, Oyster mushroom, wood ear mushroom, paddy straw mushroom, winter mushroom
2. Button (France) and Oyster (USA)
3. In India 80 g, and in China about 20 kg per person per year
4. Shiitake

## UNIT 1.3: Different Types of Mushrooms Under Cultivation in India

### Unit Objectives

**After the completion of this unit, the participant will be able to:**

1. Explain when mushroom cultivation started in our country.
2. Identify the different mushrooms whose cultivation technology is available in our country.
3. Identify what are different types of mushrooms under cultivation.
4. Recognise the regions within the country where these are cultivated.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images such as mushroom suitable for cultivation in India and suitable for different climatic conditions etc.

### Explain

- Different mushrooms that grow in different temperature range
- Different type of mushrooms that can be cultivated in different temperature ranges. Make sure that students have understanding of temperature scale and how humidity is expressed.
- Four mushrooms cultivated in our country.

### Ask

- The students to analyse the temperature conditions of their area and select the species for cultivation.

### Elaborate

With the help of participant handbook and other audio visual aids, explain the following:

- History of mushroom cultivation
- Mushrooms suitable for cultivation in India
- Mushrooms suitable for different climatic conditions
- Temperate mushrooms
- Sub-tropical mushrooms
- Tropical mushrooms
- Mushrooms under cultivation at present
- Button mushroom production and productivity in the country

## Activity



- Show some images of different mushrooms and ask the participants to identify and write the names.
- Put a political map of India and ask 5-6 participants to locate the regions popular for mushroom cultivation.
- Discuss with the peer members for any inputs.

## Notes for Facilitation



- Prepare some charts/ flip charts on season wise cultivation of mushroom.
- Use maps for better understanding of region wise mushroom cultivation.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Encourage peer learning among participants in the class by answering other participant's questions.

## Exercise



### Key Solutions to PHB Exercises

1. Paddy straw mushroom
2. Paddy straw mushroom
3. Button mushroom
4. Milky mushroom
5. Oyster mushroom
6. Milky mushroom at 30-35°C, white button at 16-18 °C, Paddy straw mushroom at 30-40°C, Wood ear mushroom at 20-30°C.

## UNIT 1.4: Some Basic Terms and Equipment Used in Mushroom Cultivation

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain commonly used terms like spawn, substrate, spawn-run, casing, flush, etc.
2. Identify equipment used in mushroom cultivation.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images of spawn, casing, substrate, different equipment.

### Ask

Ask the following questions to the participants:

- What is fungi?
- What is substrate?

### Elaborate

With the help of participant handbook and other audio visual aids explain the following terms:

Actinomyces	Bran	Pinhead
Agar	Casing	Phase-I
Agaricus bisporus	Conditioning	Phase-II
AHU	Culture	Pleurotus
Aerobic	Fruit body	Spawn run
Anaerobic	Fruiting	Spawning
Ascomycetes	Functional food	Stoma
Auricularia	Gills	Substrate
Bagasse	Lentinula edodes	Volvariella volvacea
Basidiomycetes	Mushroom	
Bioremediation	Pasteurization	

## Activity



- Assign one topic to participants and ask them to give oral presentation in front of whole class.
- Make sure each participants actively participate.
- Keep participant motivated to ask questions.
- Make sure everyone listen carefully to the oral presentation.
- Clear doubts if any.

## Notes for Facilitation



- Clear each terminology with the help of pictures and videos.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Encourage peer learning among participants in the class by answering other participant's questions.

## Exercise



### Key Solutions to PHB Exercises

1. Spawn, 2 Casing, 3 Phase I, 4 Phase II, 5 Mycelium, 6 Shiitake and 7 Button mushroom.

## UNIT 1.5: Steps in Mushroom Cultivation: Spawn-Compost-Cropping - Marketing

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain different steps in mushroom cultivation.
2. Discuss about different methods of spawning.
3. Compare different methods of making substrate as per mushroom.
4. Classify mushrooms based on use viz.: edible, supplement and medicinal.
5. Identify types suitable for cultivation in our country.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images showing steps of mushroom cultivation, methods of spawning, methods of making substrate and classification of mushroom.

### Ask

Ask the following questions to the participants:

- What is spawn compost?
- Do you know steps of mushroom cultivation?

### Explain

With the help of participant handbook and other audio visual aids, explain the following:

- Spawn is the seed of mushroom.
- Three steps in mushroom cultivation- spawn, compost and cropping.
- Types of Mushroom suitable for cultivation in different regions and temperatures (Winter mushroom, button, oyster and paddy straw mushroom.
- It will be appropriate if you can actually show commercial spawn bag, a mushroom producing bag, mushrooms in punnets ready for sale.

### Demonstrate

- Spawning process through audio visual aids.

## Notes for Facilitation



- Arrange and show some relevant videos on steps and methods of mushroom cultivation.
- Arrange for some visit in nearby mushroom farm/ centre to live experience.
- Try to give them hands on training for spawning and substrate making.

## Exercise



### Key Solutions to PHB Exercises

1. Spawn, Composting, Cropping
2. Button mushroom

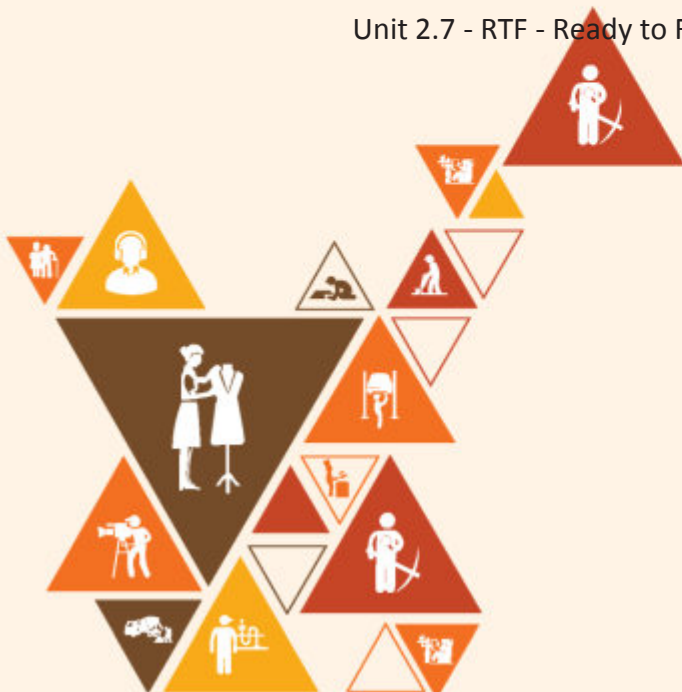






## 2. Preparation and Pasteurization of Mushroom Compost

- Unit 2.1 - Compost for Button Mushroom - Raw Materials, Natural and Synthetic Compost & Different Formulae
- Unit 2.2 - Methods of Compost Preparation: Phase I (Wetting, Mixing, Outdoor Aerobic Compositing)
- Unit 2.3 - Phase II - Conditioning and Pasteurization of Compost in Tunnels
- Unit 2.4 - Preparation of Substrate for Paddy Straw Mushroom, Oyster and Milky Mushroom
- Unit 2.5 - Preparation of Substrate for Shiitake, King Oyster, Wood ear Mushroom & their Cultivation
- Unit 2.6 - Methods to Prevent Diseases Sanitation their Control and Cook Out After Cropping
- Unit 2.7 - RTF - Ready to Fruit Bags for Small Scale Cultivation



## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. Explain the importance and function of compost in mushroom cultivation.
2. List different types of compost used in mushroom cultivation.
3. Describe the long and short methods of preparing mushroom and the difference between them. ☒  
List different types of fertilizers used for preparing mushroom compost.
4. Describe the process of preparing mushroom compost.
5. List various ingredients to rectify mineral deficiencies and stabilise the effect of ammonium content in the mushroom compost.
6. Explain the importance of ensuring adequate aeration in mushroom compost.
7. Describe the process of pasteurising mushroom compost.
8. Explain how to protect the mushroom compost from pathogens and pests.

## UNIT 2.1: Compost for Button Mushroom - Raw Materials, Natural and Synthetic Compost & Different Formulae

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Select appropriate materials to prepare the compost
2. Identify different types compost
3. Select the methods of composting
4. Undertake post-work activities

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Audio visual aids on cultivation of wood ear mushroom, types of compost, and methods of composting.

### Ask

- What do you understand by compost?
- How many of you have seen compost being prepared that is commonly applied in the fields?
- Do you know that the compost made for mushrooms is very different from the compost used in our fields as it is made under aerobic conditions?

### Explain

Before starting the lecture, explain:

- That Carbon and Nitrogen are important component of all organisms.
- Explain the meaning of aerobic (in presence of air) and anaerobic (absence of air) conditions.
- The term carbon dioxide and ammonia and how it is measured?
- Meaning of ppm (parts per million)
- How temperature is measured?

### Elaborate

**Determination of humidity if dry bulb temperature is 18 °C and wet is showing 16 °C.**

When dry bulb temperature is 18 °C degree centigrade and wet bulb is 16 °C, then the difference is 2 and at a difference of 2 under 18 we can see a value of 82. Hence, if the dry and wet bulb thermometer is showing 18 °C and 16 °C degree temperature, then the humidity in the room will be 82%.

- Different types of wastes available in the region.
- Emphasize that the formula to be selected should be based on the raw materials available in the region.
- Explain that how nitrogen is calculated in a formula. It will be good to give a simple exercise before proceeding further.

#### **Additional information for the trainer**

The initial N content has limited effect on the final N content at the time of filling of the compost in the tunnel as can be seen below. The main affect is on ammonium part. Many people feel that there should be less ammonia at the time of filling. There should be good smell of ammonia at the time of filling.

### **Demonstrate**

- Method to calculate N content with the help of charts (Refer to section 2.1.3.2) of participant handbook)

### **Notes for Facilitation**

- Keep ready/prepare chart on different commercial formulation.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Encourage peer learning among participants.

### **Exercise**

#### **Key Solutions to PHB Exercises**

1. Natural compost has Horse manure as its main ingredient. Compost without it are called synthetic composts.
2. Sweet smell, pH 7.2-7.8

## UNIT 2.2: Methods of Compost Preparation: Phase I (wetting, mixing, outdoor aerobic compositing)

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Select raw material and explain pre-wetting of straw and mixing of ingredients.
2. Perform aerobic fermentation in piles and air circulations pipes below the compost pile.
3. Explain phase -I and significance of repeated turnings.
4. Identify the characteristics of good quality Phase I compost ready for pasteurisation.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Audio visual aids in making compost.

### Ask

- Which raw material is easily available to you?
- Which raw material you would prefer for composting and why?
- Are you well understood how to prepare formulations?
- Where will you prepare compost?

### Say

- Appreciate the participants for their active involvement.
- Share your insights on the responses.

### Elaborate

- Methods of compost preparation.
- Long method of compositing (IMC).
- Steps in making compost by long method.
- Short Method of Composting (SMC)
- Phase-I or Outdoor Composting

## Activity



- Divide the whole class into 3-4 groups.
- Ask the each group to make slide/ chart/ deliver oral presentation on “steps in making compost by long method”
- Ask the group representative to deliver the presentation on the same, which will help in peer learning.

## Notes for Facilitation



- If possible, use audio visual aids to show methods of compost preparation.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Try to arrange for some hands on training.

## Exercise



### Key Solutions to PHB Exercises

1. 28 days
2. All the above

## UNIT 2.3: Phase II - Conditioning and Pasteurization of Compost in Tunnels

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify the different steps and temperature profiles to be kept in tunnel.
2. Define the characteristics of good compost.

### Resources to be Used

- Participant handbook (PHB), charts, slides, visuals/videos on phase II of composting, notepad and pen.

### Ask

- What is pasteurization?
- What is conditioning?

### Explain

- The term phase II
- The ideal characteristics of tunnel
- About pasteurization and conditioning
- Characteristics of the compost after phase-II

### Field Visit

- Organize a visit to nearby mushroom farm where pasteurization and conditioning is being carried out.

### Notes for Facilitation

- Arrange enough visuals/charts on how phase II is commenced.
- Take frequent breaks and repeat the session for better understanding.
- Motivate the participants to ask any doubts.

### Exercise

**Key Solutions to PHB Exercises Tick one answer in the following**

1. 57-60 °C
2. 45-52 °C

## UNIT 2.4: Preparation of Substrate for Paddy Straw Mushroom, Oyster and Milky Mushroom

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify that composting is not required in all mushrooms
2. Compare different methods of substrate preparation for Oyster and milky and paddy straw mushroom.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images like solar energy based model for cultivation of Oyster mushroom and pasteurisation using chemicals.

### Say

- Pasteurisation using chemicals has played important role in the spread of the technology but now there is going to be ban on the chemicals used for this purpose (bavistin). Hence hot water treatment may followed.
- Emphasize that overheating is not required and is rather harmful. This can be exemplified using the analogy of pasteurisation of milk where we treat to specific temperature for short time and do not boil and pack it.
- Try to develop solar-based model by making modification in normal solar water heater to ensure that all the hot water comes out in one go without being diluted with cold water. This will involve putting a stopper at inlet and another stopper for allowing air to enter when the drum is being evacuated. Just after that, we can close the air inlet and open the cold-water inlet. With little innovative thinking, you can put these valves in the room itself instead of every time climbing up. See if the following mechanism works.
- In paddy, straw mushroom (PSM), the maximum storage time of spawn after preparation is within 15 days.
- PSM can be cultivated outside like under the shades of coconut tree.

### Explain

- Usable substrates for preparation of oyster mushroom.
- Precautions to be used while selecting the substrate.
- Technique for using straw.
- The process how pasteurization is carried out with chemicals.

## Elaborate

- The process how solar water heater could be used for hot water treatment of straw. (Refer to section 2.4.1.4 of PHB)
- The reason for recommending pasteurization in tunnel over hot water treatment.

## Activity

- With the help of relevant videos, show the process of pasteurisation using chemicals, hot water treatment and autoclaving.
- Motivate students to engage in the video.
- Conduct a question answer session at the end of the video session.
- Answer each questions individually.
- Appreciate the students who were actively asking questions.

## Say

- I hope you all enjoyed the video. It will help you to understand the topic better.

## Notes for Facilitation

- Always use audio visual aids for better understanding of the topic.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Try to arrange for real time scenarios for better learning. Hands on training must be included for majority of the sessions.

## Exercise

### Key Solutions to PHB Exercises

1. Chemical sterilisation, Hot water treatment, Autoclaving
2. Yes, it can be cultivated on other materials like cotton waste
3. Paddy straw mushroom

## UNIT 2.5: Preparation of Substrate for Shiitake, King Oyster, Wood Ear Mushroom and their Cultivation

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain that substrate preparation for some mushrooms needs autoclaving.
2. Identify the different types of materials that can be used to grow different mushrooms.
3. Determine cultivation process of Shiitake, wood ear mushroom and king Oyster.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides and videos on Shiitake wood ear mushroom etc.

### Ask

- If participants have ever seen Shiitake mushroom?
- If they have ever eaten this mushroom?
- If they know that Shiitake and Oyster mushroom?

### Say

- That the substrate for shiitake must be, saw dust from broad-leaved trees only whereas the other two can grow on other types of dust as well.
- It is most cultivated mushroom.
- Cultivation is done on wood logs.

### Explain

- Most suitable substrate and their composition (Refer to section 2.5.1.1 of PHB) of substrate preparation mentioned in the PHB.
- With the help of appropriate images and charts the process of bag filling and spawning.

## Notes for Facilitation



- Repeat the session with audiovisual aids.
- Arrange for the labs/ farm visits where these are grown.

## Exercise



### Key Solutions to PHB Exercises

1. Awareness about health benefits and methods of consumption
2. Cold shock treatment
3. (c) Saw dust of narrow leaved trees

## UNIT 2.6: Methods to Prevent Diseases, Sanitation, their Control and Cook Out After Cropping

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Recall the importance of hygiene in mushroom cultivation.
2. Explain why prevention is better than cure.
3. Discuss the procedures for maintaining hygiene before, during and after cropping.
4. Identify the significance and need for cook out.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation/charts showing specific images on sanitation and hygiene.

### Ask

- How hygiene is necessary to minimize the possible incidence of the pests and pathogens.
- In your opinion why prevention is better than cure?

### Elaborate

There are hardly any chemicals having label claim for mushroom and hence prevention is must even after use of chemicals the possibility of getting normal yield is not there. The chemicals and cook out is used for protection of subsequent crops Flies, humans and equipment used daily act as a carrier of diseases. Mushroom flies are much smaller in size and hence the mesh normally used in houses may not be enough. At present there are hardly any farms that go for cook out. However, without it, the chances of long time survival of the project are very low.

### Explain

- Why the appropriate/ recommended measure is important?
- The term cook out and when it should be done.
- The process of cookout.

## Notes for Facilitation



- Always use audio visual aids for better understanding of the topic.
- Ask the participants if they have any questions and try to clarify their doubts.

## Exercise



### Key Solutions to PHB Exercises

1. Spores get disturbed by splashes of water
2. 70 °C, 6-8 hours

## UNIT 2.7: RTF - Ready to Fruit Bags for Small Scale Cultivation

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Recall the scope of cultivation of mushrooms in urban areas as household activity.
2. Identify the facilities required for production of RTF bags.
3. State the need for total quality management.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images like RTF bags etc.

### Ask

- Have you ever seen RTF bags?
- What is small-scale cultivation?

### Elaborate

- Ready to fruit bags with the help of suitable images and examples.

### Notes for Facilitation

- Always use audio visual aids for better understanding of the topic.
- Arrange for sample of RTF bags.
- Ask the participants if they have any questions and clarify all doubts of the participants.

### Exercise

#### Key Solutions to PHB Exercises

1. Yes, Ready to fruit bags can be an effective way to spread awareness about mushrooms in urban areas. These bags provide an easy and convenient way for people to grow their own mushrooms at home, even in small spaces. By using these bags, people can learn about the different types of mushrooms, their nutritional value, and the environmental benefits of growing and consuming them.







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## 3. Procurement of Inputs and Site Preparation for Mushroom Cultivation

Unit 3.1 - Selection of Species for Round the Year Cultivation Based on Climatic Conditions and Raw Materials Available

Unit 3.2 - Basic Requirements for Site Selection and Starting Mushroom Cultivation

Unit 3.3 - Farm Design for Compost and Cropping of Button Mushroom for Seasonal and Round the Year Commercial Cultivation

Unit 3.4 - Procedure for Cultivation of Button Mushroom

Unit 3.5 - Farm Design and Procedure for Cultivation of Other Mushrooms


Unit 3.6 - Spawn Preparation, Transport and Storage



**AGR/N7814**

## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. List varieties of mushroom commonly cultivated in different geographical conditions.
2. Describe the appropriate growing conditions for varieties of mushroom.
3. Describe the process of negotiating with vendors and procuring the required inputs.
4. Explain the appropriate conditions for storing the various inputs required for mushroom cultivation.   
Describe the process of using mushroom spawns.
5. List various materials required for setting up a mushroom farm.
6. Explain the criteria for selecting a site for mushroom cultivation.
7. Explain the importance of having an effective water drainage system at the site of mushroom cultivation.
8. Describe the process of preparing the layout and establishing a mushroom farm.

## UNIT 3.1: Selection of Species for Round the Year Cultivation Based on Climatic Conditions and Raw Materials Available

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify the climatic requirements of various mushroom species
2. Select the species for cultivation during different months
3. Develop a system for round the year cultivation of different mushrooms and generate employment and money
4. Select the suitable raw materials for cultivation of a mushroom
5. Select and adopt the system for cultivation of a particular mushroom depending upon the scale of cultivation, infrastructure available, etc.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Charts/slides in power point presentation showing relevant images

### Say

- Species cultivated in different parts of our country and in different countries depend upon climatic conditions and choice of people living there.
- China excelled in production of mushrooms as they identified species region-wise and season-wise for each location.
- Appraise the students about the raw materials locally available.
- This lecture provides good opportunity to give more emphasis on the mushroom that is most suitable for your region.
- Always procure the spawn from authentic/govt. sources.

### Activity

- Arrange the participants in 4-5 groups and ask them to discuss with each other and write down the climate prevailing in their area including temperature, rainfall pattern and most desirable raw material.
- Share with the peer members.
- Facilitate the trainees to select and identify the species suitable for the area.

## Notes for Facilitation



- Prepare charts of the species as per their suitability to the climatic conditions.
- Also, keep ready the slides or flip chart on different raw material and their efficiency/ nutrient status.
- Keep some references material handy to share for year round cultivation of mushroom.
- Arrange for suitable examples.
- Motivate participatory approach.

## Exercise



### Key Solutions to PHB Exercises

1. White Button Mushroom
2. Spawn run- 23 to 25 and cropping- 15 to 17

## UNIT 3.2: Basic Requirements for Site Selection and Starting Mushroom Cultivation

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify the basics of a site selection from point of market, infrastructure, availability of labour, water, electricity, etc.
2. Discover social and environmental issues related to the mushroom cultivation, especially preparation of compost.
3. Find out other facilities required near unit.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, participant handbook (PHB) etc.

### Notes

- This unit may be more of interactive one where you may ask the participants that based on the knowledge acquired so far what a participant will look for while selecting the site. Based on the input add the information that has not been covered.
- The guiding principle should be convenience, feasibility, social acceptability of the project, and above all economic benefits.
- Also, highlight that one of the primary requirement is good knowledge of the subject, which the trainees are acquiring. Without good understanding of the subject all other arrangements will not be productive.

### Explain

- The scale of mushroom production affect the farm design.
- Basic requirement for site selection such as market access, water availability, easy availability of raw material at cheaper rate, away from municipal waste.

### Activity

- Prepare the list of spawn availability /supplier around your area.
- Prepare chart in-group of 4-5 members to compile rate of wheat straw per ton and labour monthly charges.
- Share it with the peer group.

## Notes for Facilitation



- Always use audio visual aids for better understanding of the topic.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Encourage the participants for learning by doing.
- Arrange for more practical assignments.

## UNIT 3.3: Farm Design For Compost and Cropping of Button Mushroom for Seasonal and Round the Year Commercial Cultivation

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Design unit for seasonal cultivation of button mushroom
2. Follow the different steps in construction of huts
3. Recognize the materials and their quantity required for making huts and compost
4. Design facilities for Phase-I composting including development of bunkers
5. Design and develop tunnel for Phase II
6. Design cropping rooms for round the year cultivation
7. Explain the need for synchronisation in size of cropping room with tunnel, that of tunnel with bunker and give space.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images like design of tunnel for Phase II.

### Explain

- Prepare thatched structure for seasonal cultivation.
- Grow in climate control environment for all the year round production e.g. polyhouses.
- Various types of machines used for making compost.
- Casing unit and why it is required.

### Demonstrate

- Steps for layout as mentioned in Fig. 3.3.2 of PHB.
- How to calculate benefit cost ratio with the help of Table 3.3.1 in PHB (May also demonstrate with more suitable examples).

### Activity

- Ask the participants prepare layout of complete mushroom unit having compost facility and cropping rooms.
- Make sure each participant is actively engaged in the activity.

## Notes for Facilitation

- Always use audiovisual aids for better understanding of the topic.
- Pre-arrange visit to the nearby mushroom units with different farm design and infrastructure.
- Ask the participants to observe carefully and involve them through queries and possible innovations they could think for their area.

## Exercise

### Key Solutions to PHB Exercises

1. Bamboos are a major part of the cost and in subsequent years the bamboos purchased in the first year can be used for 4-5 years
2. There should be synchronisation in all the three. Tunnel should produce only that amount of compost that can be accommodated in one room. Similarly bunker should produce that much compost that can be filled in the tunnel.
  - Tons of compost that can be accommodated in cropping rooms =  $l \times b \times h / 600$
  - Tons of compost that can be produced from tunnel =  $l \times b / 16$
  - Area of bunker is 1.3 to 1.5 times more than the area of tunnel.
3. Yes, phase-I can be completed only by making piles and turning at regular intervals.
4. Such a room will have five corridors (5 x 3.3') and four rows of stands (4 x 4.8'). Thus inner width of cropping room will be  $(5 \times 3.3') + (4 \times 4.8') = 35.7$  or say 36'
5. Inside height = 16.5'
6. There is about 10% loss in air flow at each bend

## UNIT 3.4: Procedure for Cultivation of Button Mushroom

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. List the steps from spawning to cropping
2. Identify the change in temperature, aeration and humidity at different stages of cultivation.
3. Explain about harvesting and storage of mushroom.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images like cultivation of button mushroom in bags.
- Available videos as reference materials on 'eSkill India Portal' and from relevant institutions.

### Ask

- Do you know the difference between cultivation of button mushroom in bags and cultivation of mushroom in shelves?
- Do you have any idea about harvesting and post-harvest storage of mushroom?

### Elaborate

Before going to the actual procedure, it may be better to reiterate major steps in button mushroom cultivation as shown below:

- The significance of 3H, Hygiene, humidity and homogenisation may be again highlighted. It may be highlighted that spawning and bag filling is to be done under hygienic conditions and whether hands or machines will do spawning and bag filling will depend upon the volume of compost to be handled per day.
- May emphasize that temperatures mentioned are not of the room but of the compost.

### Explain

- The ideal depth of filling the spawned compost in bags up to one feet.
- The recommended temperature to keep the bags.
- To keep the room closed during spawn run to increase the temperature.
- The term casing and how much casing soil is required to cover the top of the bags.
- Lowering of temperature to 16-18 °C and fresh air induction is important for pinning.
- The post-harvest temperature of 4-8 °C to be ensured due to low self-life.

## Field Visit



- Arrange for a nearby mushroom farm visit to understand practical demonstration of the procedure.

## Notes for Facilitation



- A chart showing changes to be made in temperature from spawning till harvest may be displayed and it may be emphasized that there can be slight variations in this depending upon the strain as some strains may fruit at slightly higher temperature or carbon dioxide level.
- Also prepare charts or images on prevalence of various diseases like, wet bubble, bacterial blotch etc. if the hygiene and precautions are not undertaken.
- Motivate through demonstrating economics and profitability in the venture.

## Exercise



### Key Solutions to PHB Exercises

1. Temperature, 16-18 °C. humidity 85-90% and carbon dioxide concentration 800-1500 ppm
2. 3.4.2. 25°C

## UNIT 3.5: Farm Design and Procedure for Cultivation of Other Mushrooms

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Compare different types of structures for growing mushrooms.
2. Describe the procedure of cultivation of oyster, milky and paddy straw mushroom.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing specific images like types of structures for growing mushrooms.

### Ask

- If the participants are aware of various mushroom growing structures? If yes, which is the most commonly adopted?
- To recall the session on substrates for different mushrooms of oyster and milky mushroom.
- Discuss why recalling is important in context to farm design.

### Note

In our country, even large scale cultivation of these mushrooms is done as seasonal activity only. Hence cultivation is mostly in huts and material used for construction of huts varies from place to place.

- Farm design.
- Cultivation of oyster
- Harvesting and post-harvest storage
- Oyster mushroom cultivation
- Cultivation of milky mushroom
- Paddy straw mushroom

### Demonstrate

- With the help of images and relevant videos, the process of cultivation of other mushrooms such as oyster, milky and paddy straw.

## Activity



- Arrange the participants in 4-5 groups and assign each group different mushrooms to discuss and prepare stepwise process on chart.
- Ask them to present procedure to peer members.

## Notes for Facilitation



- Always use audio visual aids for better understanding of the topic.
- Focus on learning by seeing and doing through participatory approach.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Always sum up the session and make a record of any further learning and skill requirement on the topic.

## Exercise



### Key Solutions to PHB Exercises

1. Mushrooms with long stipe and small cap will be produced
2. Blue
3. Ten days for spawn run and about 10-12 days for fruit body development?

## UNIT 3.6: Spawn Preparation, Transport and Storage

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify the ingredients of spawn
2. Practice to make grain spawn
3. Follow the precautions during transport and storage

### Resources to be Used

- Available objects such as a whiteboard, duster flip chart, pen, paper, etc.
- Slides/videos showing spawn preparation, its ingredients and essential precautions etc.

### Say

- Good day and welcome to the training session. Discuss about the session plan with participants.

### Ask

- Do you know the ingredients of spawn?
- In your opinion, what precautions should be taken during transport and storage?

### Explain

With the help of participant handbook and other audio visual aids, explain the following:

- About spawn.
- Steps of spawn production and method of spawn storage.
- Spawn could also be procured from govt. or private laboratories.
- The adverse effect of high temperature during transportation.
- Type of cotton to be used for preparing cotton plugs and alternative for cotton.

### Demonstrate

- Show the trainees a culture tube, master culture in bottle and commercial culture in polypropylene bag.
- If possible, take them to spawn lab or where mushrooms are prepared and stored.

## Notes for Facilitation



- Show proper audio visual aids for spawn preparation.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Encourage peer learning among participants in the class by answering other participant's questions.

## Exercise



### Key Solutions to PHB Exercises

1. To avoid death and contamination as spawn cannot tolerate temperature above 32 °C
2. Polyfill
3. Wheat, Rye, pearl millet, Sorghum







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# 4. Mushroom Cultivation Process

Unit 4.1 - Spawning in Mushrooms

Unit 4.2 - Utilization of Spent Mushroom Substrate



**AGR/N7815**

## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. Describe different methods of spawning mushroom seeds such as spot spawning, surface spawning, layer spawning, etc.
2. List various materials required for spawning and preparing casing soil.
3. Describe the process of preparing casing soil.
4. Describe the importance and process of compost turning.
5. Explain the importance of maintaining the recommended temperature, Potential of Hydrogen (pH) and relative humidity during mushroom cultivation.
6. Describe the methods of recycling and disposing different types of waste.

## UNIT 4.1: Spawning in Mushrooms

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Describe different methods of spawning mushroom seeds such as spot spawning, surface spawning, layer spawning, etc.
2. List various materials required for spawning and preparing casing soil.
3. Describe the process of preparing casing soil.
4. Describe the importance and process of compost turning.
5. Explain the importance of maintaining the recommended temperature, Potential of Hydrogen (pH) and relative humidity during mushroom cultivation.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides in power point presentation showing related images.

### Ask

- Have you ever grown mushrooms before?
- What do you know about spawning in mushroom cultivation?

### Do

- Explain the different types of spawning used in mushroom cultivation and the ideal conditions for each
- Discuss the materials required for spawning and casing.

### Demonstrate

- With the help of available resources demonstrate how to prepare casing soil and explain why casing is required.
- Different types of spawning

### Explain

With the help of participant handbook and other audio visual aids, explain the following:

- Ideal temperature, pH, and relative humidity required for mushroom cultivation
- Process of preparing casing soil
- importance and process of compost turning.

## Activity

**Purpose:** To teach participants how to prepare mushroom spawn and inoculate substrate for mushroom cultivation.

**Methodology:** This is a hands-on activity that will involve preparing mushroom spawn and inoculating substrate with the spawn activity.

**Duration:** 2 hours

**Resources needed:** Mushroom spawn (e.g. grain or sawdust) Substrate material (e.g. compost or straw) Sterilized containers or bags for spawning Sterilized trays for casing Sterilized instruments for inoculation (e.g. scalpel, spoon, or syringe) Gloves, face masks, and other personal protective equipment (PPE)

**Expected outcome:** Participants will gain hands-on experience in preparing mushroom spawn and inoculating substrate for mushroom cultivation. They will learn the different types of spawning methods, understand the importance of using sterile techniques, and how to optimize environmental conditions for mushroom growth.

### Instructions:

- Divide participants into small groups of 3-4 people.
- Provide each group with the necessary materials and equipment for the activity, including mushroom spawn, substrate material, sterilized containers or bags, sterilized trays, sterilized instruments, and PPE.
- Explain the different types of spawning methods and their respective advantages and disadvantages.
- Demonstrate how to prepare mushroom spawn using the selected method (e.g. grain or sawdust), and how to inoculate the substrate material.
- Instruct participants to follow the steps demonstrated to prepare mushroom spawn and inoculate the substrate.
- Provide guidance and answer any questions or concerns participants may have throughout the activity.
- Once all groups have completed the activity, review the results and discuss any challenges or successes encountered during the process.
- Conclude the activity with a summary of key takeaways, and provide participants with additional resources for further learning.

## Notes for Facilitation

- Have all the necessary materials and equipment ready for the hands-on activity.
- Encourage the participants to ask questions and clarify any doubts.
- Monitor the participants during the hands-on activity to ensure safety and accuracy.
- Provide feedback and suggestions for improvement during the hands-on activity.
- Conclude the session with a review of the key concepts covered in the chapter.

## Exercise

### Key Solutions to PHB Exercises

1. Maintaining the recommended temperature, pH, and relative humidity during mushroom cultivation is crucial because it affects the growth and development of the mushroom. The temperature affects the speed of mycelial growth, pH affects nutrient availability and the mushroom's ability to resist disease, and relative humidity affects fruit body formation and growth.
2. The process of preparing the casing soil involves mixing peat moss and vermiculite, pasteurizing the mixture, and then allowing it to cool and dry. The casing soil is then applied on top of the colonized substrate to provide a favourable environment for fruit body formation.
3. There are several methods of spawning mushroom seeds, including spot spawning, surface spawning, and layer spawning. In spot spawning, mushroom spores are placed in small holes or depressions in the substrate. In surface spawning, spores are spread evenly over the substrate surface. In layer spawning, a layer of colonized substrate is placed on top of another layer of uncolonized substrate.

## UNIT 4.2: Utilization of Spent Mushroom Substrate

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify that waste equivalent to more than half the weight of the compost filled in the room is produced.
2. Compare methods of its utilization for production of compost, vermi-compost, etc.
3. Identify uses and problems of spent mushroom substrate.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.

### Say

- Mushroom cultivation is a way for complete recycling of agro wastes.
- As SMS (Spent mushroom substrate) has more salts, it should not be put in the same field every year.
- It is better to compost SMS before use.

### Ask

- The participants to list the uses and problems of spent mushroom substrate.
- Ask them to share with peer members for their views and healthy discussion.

### Do

- Prepare list on charts or slides of different ways of using SMS.
- Arrange for some examples through relevant websites, YouTube where SMS are used as animal feed for vermi-composting.
- Also, demonstrate to check the SMS quality before using in field for keeping in view of its high salt concentration and any heavy metals.
- Generate environmental awareness in context to SMS utilization.

### Notes for Facilitation

- Always use audio visual aids for better understanding of the topic.
- Arrange for some live demonstration, if possible.
- Encourage peer learning among participants in the class.

## Exercise

### Key Solutions to PHB Exercises

1. Oyster mushroom
2. It has high amount of salts and repeated addition may lead to salinity related problems.







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# 5. Mushroom Handling, Harvesting, and Processing

Unit 5.1 - Various Diseases; Indicator Molds, Fungal, Bacterial, Viral Diseases,  
Various Insects Affecting Mushrooms

Unit 5.2 - Organic Mushroom Cultivation

Unit 5.3 - Mushroom Flush: How Many; How to Harvest and Pack Mushrooms

Unit 5.4 - Sun Drying and Pickling Mushrooms

Unit 5.5 - Some Mushroom Recipes



**AGR/N7816**

## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. Describe the process of maintaining varieties of mushroom before harvesting.
2. List common mushroom pests, insects, fungi, diseases and their remedies.
3. Explain the importance of using sterilised pots, containers, tools and equipment to control nematodes, mites, insect, pests etc.
4. Describe various measures to protect the mushroom cultivation area from contamination.
5. Explain different growth indicators to identify the readiness of mushroom for being harvested.
6. Describe various techniques for harvesting mushroom.
7. Explain various parameters for sorting and grading the harvested mushroom.

## UNIT 5.1: Various diseases; Indicator molds, Fungal, Bacterial, Viral diseases, Various Insects Affecting Mushrooms

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify the reasons for occurrence of diseases.
2. Explain the common fungal, bacterial and bacterial diseases, their methods of dispersal and control.
3. Discuss about different insects affecting mushrooms and their control.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Slides/charts/videos depicting causes, diseases and insects of mushrooms diseases etc.

### Do

- Make chart of biotic and abiotic factors.
- Show slides/ images of mushroom diseases due to various factors.
- Refer Table 4.1.1 of the PHB and arrange for visuals for the diseases.
- You may also refer to the figures in the related section of PHB

### Activity

- Arrange pictures and their symptoms for different mushroom diseases.
- Ask participants to identify and match with respective cases.
- This activity will help them in memorising the content.

### Notes for Facilitation

- Always use audio visual aids for better understanding of the topic.
- Ask the participants if they have any questions and clarify all doubts of the participants.
- Encourage peer learning among participants in the class by responding other participant's questions.

### Exercise

#### Key Solutions to PHB Exercises

1. Spawn run will be affected and indicator mould like Inky caps will appear.
2. Presence of olive green mould indicates lack of aeration.
3. Wet bubble.
4. Phorids, Sciarids and Cecids.

## UNIT 5.2: Organic Mushroom Cultivation

### Unit Objectives

**After the completion of this unit, the participant will be able to:**

1. Find out that possibility to grow mushrooms organically.
2. Recognise the conditions that are necessary for such production.

### Resources to be Used

- Audio visual aids, instructional charts, internet connection if possible and participant handbook (PHB).

### Ask

- Have you ever heard about organic mushroom production?
- Do you think chemical is used in organic mushroom cultivation?

### Elaborate

- It may be better to use the term chemical free mushroom cultivation rather than organic mushroom cultivation because there are no standards and it may not be possible to certify ingredients used as organic. It is a debatable issue that whether mushroom cultivated on straw not grown organically can be called organic or not.
- It is not possible to grown mushrooms organically if compost is to be made using long method of compositing.
- Autoclaving of the substrate for organic cultivation of Oyster, Milky, Shiitake etc. is better than other approaches as chances of contamination are minimum
- Most of the trees are grown without use of chemicals and hence the sawdust obtained from them can be treated as organic. Hence, mushrooms cultivated on sawdust without use of chemicals are organic.

### Activity

- Make a group of 4-5 and ask the each group to discuss among them on the topic organic mushroom grower.
- Ask the group representative to share the outcome for peer learning.
- Facilitate the members so that motive of understanding organic concept is accomplished.

## Notes for Facilitation

- Show some videos on organic mushroom cultivation.
- Show more innovative images as per requirement for better understanding of the topics.
- Motivate the participants for participatory learning approach

## UNIT 5.3: Mushroom Flush: How Many; How to Harvest and Pack Mushrooms

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Identify what is a mushroom flush
2. Determine how many flushes should be harvested under different growing systems
3. Explain how to harvest and do packing of mushrooms

### Resources to be Used

- Participant handbook (PHB), harvesting calendar, images/slides or sample of packing material.

### Say

- From one bag, mushrooms do not appear only once but keep on coming after every harvest, though the production declines with every next crop.
- Disease incidence increases and yield decreases after third flush. Hence, most of the commercial growers take only three and some only two flushes.
- Harvesting mushrooms is an art and in foreign countries, there are separate trainings to train the people to harvest mushrooms.
- Packing mushrooms in punnets fetches better price. As mushrooms contain 90% water, the film should be thin or with micro holes.

### Ask

- Do you know what mushroom flush is?
- Can you guess some popular packing material for mushroom?

### Activity

- Ask the participants to prepare schedule if there are 8 rooms and total cropping period is 72 days where cleaning and refilling will take place on 73rd and 74th day respectively.
- Give them enough time to recall.
- They may refer the participant handbook
- Ask some of the volunteers to share the prepared schedule with the peer group and discuss for any improvement.
- This activity will help them in planning the harvesting schedule.

## Notes for Facilitation



- Arrange for proper visuals on step wise procedure for harvesting and packing of mushrooms.
- Ask the participants if they have any questions and clarify their doubts.

## Exercise



### Key Solutions to PHB Exercises

1. Nine days

## UNIT 5.4: Sun Drying and Pickling of Mushrooms

### Unit Objectives

**After the completion of this unit, the participant will be able to:**

1. Identify that mushrooms have short shelf life.
2. Determine that mushrooms have 90% water.
3. Explain that some of the mushrooms can be sun dried whereas all can be pickled.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Audio visual aids on mushroom products and recipes.

### Say

- Some of the mushrooms can be sun-dried but almost all can be pickled.
- Drying should not be done at temperatures exceeding 60 °C and during initial drying, gill side should be kept upwards.

### Do

- Prepare charts and arrange visuals of different types of mushrooms.
- Mark which mushrooms are suitable for sun drying.
- Tell that various dried forms like powder could be used in baking products.

### Demonstrate

- The process of sun drying of mushroom.
- Demonstrate that mushroom with open gills should be first dried with gill side upwards preferably in shade and then dried in sun.

### Explain

- Solar heater temperature maintenance of 60° C could be alternative.
- The uses of mushroom powder in making many baking products.
- Oyster mushrooms helps in reducing cholesterol.

## Exercise

### Key Solutions to PHB Exercises

1. Taste and rehydrability is affected
2. Oyster mushroom
3. 10%

## UNIT 5.5: Some Mushroom Recipes

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Explain reason for not purchasing mushrooms by some people.
2. Recognise that mushrooms are fungi and all vegetarians eat lot of fungi.
3. Prepare some indigenous recipes.
4. Make other products like biscuits, papad, etc.
5. Prepare pickle using different mushrooms.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.
- Audio visual aids on mushroom products and recipes.

### Ask

- How frequently participants eat mushroom?
- What mushroom recipes they have tried?
- Have they ever prepared mushroom pickles?

### Elaborate

Mushroom recipes such as:

- Mushroom salad
- Mushroom tomato soup
- Mushroom pakoda
- Mushroom as vegetable
- Mushroom biscuits
- Mushroom papad

### Team Activity

- Divide the participants in 4-5 groups and ask them to recall the pickle-making recipe and prepare the pickle by bringing all required material.

## Exercise

### Key Solutions to PHB Exercises

1. These become leathery

## Notes



A large rectangular area containing numerous horizontal lines for writing notes.



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## 6. Basic Entrepreneurial Activities for Small Enterprise

Unit 6.1 - Agriculture Enterprise Planning

Unit 6.2 - Agriculture Production Planning Process

Unit 6.3 - Post-Production and Marketing Management



**AGR/N9908**

## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. Explain how to analyse the demand and supply of the relevant agricultural produce in the market
2. Describe the process of identifying the target customers and assess their needs and expectations with respect to the quality and price of the produce.
3. Explain how to identify various types of agricultural entrepreneurship/ business opportunities.
4. Explain how to prepare a basic business plan for agricultural entrepreneurship/business activities.
5. State the appropriate sources of funding for the agricultural entrepreneurship/ businesses
6. State the relevant government schemes and programs
7. Explain the importance of ensuring compliance with the government structural reforms and
8. framework, along with the applicable rules and regulations.
9. List various resources required for agricultural production
10. Describe the process of planning agricultural production and the use of relevant technologies to enhance production
11. Explain the importance of ensuring no cause adverse impact on the environment and produce during production
12. State the recommended practices to be followed for efficient input resource management.
13. Describe the process of optimising the production processes and output through the amalgamation of existing practices with smart technologies.
14. Explain the recommended sustainability practices to be followed during agricultural production to prevent and deal with deforestation, loss of biodiversity, soil degradation, etc.
15. Explain how to collect information related to the wholesale and retail price of agricultural produce.
16. Explain how to calculate the economics of the produce viz. production cost, price of the produce, B:C Ratio etc.
17. Explain the relevant government schemes with the provision of subsidies/funds for the promotion of agricultural produce.
18. Describe the process of selecting appropriate marketing channels for marketing agricultural produce, and the applicable requirements and constraints.
19. List the relevant buyers of different types of agricultural produce.
20. Explain how to identify and manage various risks to production and postproduction processes.
21. Explain how to undertake outreach programs to promote agricultural products and services, and expand agri-business.

22. Explain the 4Ps i.e., product, price, promotion, and place and 4As i.e., acceptability, affordability, accessibility, and awareness considered while preparing and executing a marketing plan.
23. Explain the use of the relevant digital services such as e-commerce, epayments, electronic recordkeeping, etc
24. Explain the importance of using efficient post-production logistics.
25. Explain the importance of maintaining various records accurately

## UNIT 6.1: Agriculture Enterprise Planning

### Unit Objectives

**After the completion of this unit, the participant will be able to:**

1. Analyse the demand and supply of the relevant agricultural produce in the market.
2. Examine the identification of the target customers.
3. Explain the planning process of various business opportunities.
4. Describe the government ecosystem for various business opportunities.
5. Explain the relevant government schemes with the provision of subsidies/funds for the
6. promotion of agricultural produce.
7. Explain the basics of a business plan.
8. Describe the stakeholder coordination and procedural compliance in the business.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, Charts, PPT

### Ask

- Have you ever started or managed an Agri enterprise? If yes, what challenges did you face while planning for it? If not, what are the reasons for not starting one?

### Explain

- Explain the importance of understanding demand vs supply in Agri enterprise planning and how it can impact the success of the enterprise.
- Explain the significance of analysing the nature of consumer behaviour and how it can help in identifying the target clients and their expectations.
- Explain the basic components of a business plan and how it can help in effective planning and management of an Agri enterprise.
- Explain the various sources of funds and their availability for Agri enterprises.
- Explain the government schemes and supporting ecosystem available for Agri enterprise planning.

**Do**

- Provide examples of successful Agri enterprises that were started with a basic business plan and grew over time with the help of government schemes and supporting ecosystem.
- Share case studies of entrepreneurs who started their Agri enterprises with limited resources and overcame challenges with effective planning and management.

**Elaborate**

- Elaborate on the steps involved in developing a basic business plan, including identifying the target clients, analysing the nature of consumer behaviour, and identifying sources of funds.
- Elaborate on the various sources of funds available for Agri enterprises, including bank loans, venture capital, and crowdfunding.
- Elaborate on the government schemes and supporting ecosystem available for Agri enterprise planning, including subsidies, tax incentives, and technical assistance.

**Notes for Facilitation**

- Emphasize the importance of effective planning and management in Agri enterprise planning.
- Encourage the participants to think creatively and come up with unique ideas for their Agri enterprises.
- Provide ample examples and case studies to help the participants understand the concepts better.

**Exercise****Key Solutions To PHB Exercise****A. Short Questions**

1. There are variety of reasons. Some of the most common reasons include

- Different background and experiences
- Varying levels of familiarity
- Miscommunication
- Unreasonable or unrealistic expectations

To work out differences in target client expectations, it is important to:

- Communicate early
- Manage expectations
- Gather feedback
- Be flexible

## Exercise



### 2. Components of business plan

- Executive Summary
- Business description
- Market analysis and strategy
- Operating & financial plan
- Marketing and sales plan
- Competitive analysis
- Products and services description

### 3. Various schemes of government are

- Start up India
- Atal Innovation Mission
- New Gen Innovation and Entrepreneurship development centre
- Dairy Entrepreneurship development scheme promoted by NABARD
- Venture capital finance assistance by SFAC
- Aspire (MSME)

### 2. Multiple Choice Questions

- a) 3
- b) 4
- c) 4

### 2. Fill in the Blanks

1. Roadmap
2. Product to product
3. Demand

### 3. State Whether True/False (T/F)

1. F
2. T

## UNIT 6.2: Agriculture Production Planning Process

### Unit Objectives

**After the completion of this unit, the participant will be able to:**

1. Describe resource and natural resource management.
2. Explain the concept of sustainability for agricultural production.
3. Explain the importance of smart farming in modern day agriculture.
4. Explain how to calculate the economics of the produce viz. production cost, price of the
5. produce, B:C Ratio etc.
6. Explain the recommended sustainability practices to be followed during agricultural production.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart , pen, paper, Charts, PPT

### Ask

- What are the challenges that farmers face in managing their resources?
- What sustainable agricultural practices do you know?
- How can farmers benefit from technology in farming?

### Demonstrate

- With the help of available resources Demonstrate the different techniques for natural resource management such as conservation tillage, intercropping
- Also Show examples of sustainable agriculture practices such as Permaculture, Aquaponics and hydroponics, renewable energy resources, crop rotation and polyculture.

### Field Visit

- Organize a field visit to a farm that has successfully implemented sustainable agricultural practices or effectively used technology in their farming operations.

## Explain

- Explain the importance of resource planning in successful agricultural production and how it can lead to higher yields and profits.
- Explain how farmers can use the economies of produce to increase their returns and reduce their risks.
- Discuss the benefits of technology in agriculture, such as reducing labor costs, increasing yields, and improving farm management.

## Say

- Effective resource management is essential for successful agriculture production and sustainable practices.
- Technology can play a significant role in improving farm management practices and increasing yields.
- Sustainability is crucial for long-term success in agriculture, and we should strive to adopt sustainable practices in our farming operations.

## Notes for Facilitation

- Encourage participants to share their experiences and knowledge of resource management, sustainable agriculture practices, and technology in farming.
- Use visual aids such as pictures, videos, and infographics to help participants understand the concepts presented.
- Encourage participants to think creatively about how they can incorporate sustainable practices and technology into their farming operations.
- Emphasize the importance of planning and management in successful agriculture production.

## Exercise



### Short Answer Type Questions

1. Resource management is the practice of planning, scheduling, and allocating people, money, and technology to a project or program. In essence, it is the process of allocating resources to achieve the greatest organizational value. Good resource management results in the right resources being available at the right time for the right work. This is important in agriculture considering the limited resources and also the push in agricultural supply chain through the catastrophic challenges of climate, population rise and hunger.
2. There are various technological advancements in farming including the use of sensors which can enable the irrigation whenever required as per the plant need. Similarly, use of Soil Health Card is also one of the important components which helps farmers to assess the presence of existing nutrients and accordingly the use of NPK can be customized. It is helping for reduction in soil deterioration and on the other side being economical to farmers. Other way around, use of drones in farming. It is believed that use of Kisan drones will be promoted for crop assessment, digitalisation of land records, spraying of insecticides and nutrients.
3. Natural resource management refers to the process of managing natural resources, such as water, air, land, minerals, forests, and wildlife, in a sustainable and responsible way. It involves the development and implementation of policies, plans, and practices that aim to balance the use and conservation of natural resources to meet the needs of present and future generations.

### Multiple Choice Questions

- 1) D
- 2) C

### State Whether True/False (T/F)

1. T
2. T

### Fill in the Blanks

1. Good resource management
2. Subsidies
3. Climate Smart Agriculture

## UNIT 6.3: Post-Production and Marketing Management

### Unit Objectives

**After the completion of this unit, the participant will be able to:**

1. Explain about adequate storage facilities.
2. Describe the marketing price and related aspects.
3. Explain how to collect information related to the wholesale and retail price of agricultural produce.
4. Explain various marketing channels of distribution for agricultural produce.
5. Describe the marketing plan in association with 4Ps and 4As.
6. Explain the digital marketing process and related details.
7. Describe the stakeholder coordination and relationship management.
8. List the relevant buyers of different types of agricultural produce.
9. Explain how to identify and manage various risks to production and post-production processes.

### Resources to be Used

- Available objects such as a whiteboard, duster, marker, flip chart, pen, paper, etc.

### Ask

- What are the different types of storage structures?
- How can pricing impact the marketing of agricultural products?

### Activity

- Divide participants into small groups and ask them to choose an agricultural product and come up with a marketing plan for that product.
- Each group should identify the product's target market, select appropriate marketing channels, and determine pricing and promotional strategies.
- The groups should then present their marketing plan to the rest of the participants.

### Field Visit

- Organize a field visit to a farm or an agricultural enterprise where participants can see different types of storage structures

## Explain

- Explain the advantages and disadvantages of different types of storage structures.
- Explain the impact of pricing on marketing agricultural products.
- Explain the different types of marketing channels and their effectiveness.
- Explain how digital services can be used in marketing agricultural products.
- Explain the importance of stakeholder coordination and relationship management in agriculture.

## Say

- Choosing the appropriate storage structure, pricing strategy, and marketing channel can impact the success of your agricultural enterprise.
- Using digital services can help you reach a wider audience and improve your marketing efforts.
- Effective stakeholder coordination and relationship management is essential for the success of your agricultural enterprise.

## Elaborate

- Elaborate on the importance of selecting the appropriate storage structure for different agricultural products.
- Elaborate on how to determine appropriate pricing strategies for different agricultural products.
- Elaborate on the importance of selecting the appropriate marketing channel for different agricultural products.
- Elaborate on how digital services can be used to reach a wider audience for marketing agricultural products.
- Elaborate on the importance of stakeholder coordination and relationship management in agriculture and how it can impact the success of the agricultural enterprise.

## Notes for Facilitation

- Encourage participants to ask questions and share their experiences.
- Be mindful of cultural and regional differences in pricing, marketing channels, and stakeholder coordination

**Exercise****Short Answer Type Questions**

1. Understanding various dimensions associated with the price is important because it helps businesses make informed decisions about their pricing strategies, which can impact their profitability and market competitiveness.
2. Marketing channels can contribute to a marketer's efficiency by helping them reach their target audience more effectively and efficiently, reducing the costs of distribution, and enhancing customer satisfaction and loyalty.
3. The various types of channels include direct, indirect, and hybrid channels. Direct channels involve selling products or services directly to customers, while indirect channels involve using intermediaries such as wholesalers, retailers, and agents to reach customers. Hybrid channels combine both direct and indirect channels.
4. The 4 As of marketing refer to product, price, promotion, and place, while the 4 Ps of marketing refer to product, price, promotion, and place as well. These are the key components of a marketing strategy and help businesses develop and implement effective marketing plans to meet their objectives. The 4 As focus on the customer perspective, while the 4 Ps focus on the marketer's perspective.

**Multiple Choice Questions**

- A. 3
- B. 4
- C. 2

**Fill in the Blanks**

1. Direct and Indirect
2. Pricing

**State Whether True/False (T/F)**

1. F
2. T







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# 7. Hygiene and Cleanliness

Unit 7.1 - Hygiene and Workplace Housekeeping



AGR/N9903

## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. Explain the requirements of personal health, hygiene and fitness at work.
2. Describe common health-related guidelines laid down by the organizations/ Government at the workplace.
3. Explain the importance of good housekeeping at the workplace.
4. Explain the importance of informing the designated authority on personal health issues related to injuries and infectious diseases.

## UNIT 7.1: Hygiene and Workplace Housekeeping

### Unit Objectives

**After the completion of this unit, the participant will be able to:**

1. Explain the requirements of personal health, hygiene and fitness at work.
2. Describe common health-related guidelines laid down by the organizations/ Government at the workplace.
3. Explain the importance of good housekeeping at the workplace.
4. Explain the importance of informing the designated authority on personal health issues
5. related to injuries and infectious diseases.

### Resources to be Used

- Participant handbook, Presentation slides, Whiteboard, Markers, Pictures, Posters, Newspaper clippings, Laptop, Internet connection (if possible).

### Say

- Greet the participants and before beginning the session, recapitulate the previous session discussions.

### Activity

**Purpose:** To understand the need for personal hygiene

**Resources:** Power point slide

**Methodology:** Discussion

**Expected Outcome:** Participants have to list the external parts of the body that need to be kept clean and healthy, while explaining why it is needed.

- Put up the power point slide and start a discussion around the subject – what is personal hygiene and why it is needed.

### Elaborate

- On different articles related to safety and health given in Agriculture convention, 2002 (No.184). You can refer handbook for the articles.

## Explain

- Using the slide, explain the points that came up during the discussion and sum up as follows:
  1. What is personal hygiene
  2. Why it is important
  3. The external parts of the body that are prone to dust, dirt, oil, food particles, heat, cold, body odor.
- Further, using the slides, explain how to maintain personal hygiene at work place as well as otherwise.
- Explain how germs spread from our hands to the various parts of the external body before eventually entering the body. It is, therefore, important to wash our hands often. Using the slide, speak about the instances when we must wash our hands.
- Explain that safe and healthy working environment is a fundamental right of every citizen. Organizations and the government recognizing the need to develop a safety and health culture, have developed a framework and guidelines to reduce incidence of work-related injuries, fatalities, diseases, building awareness on safety and health at workplace. To achieve this, both the employer and employee at workplace have certain duties to comply with.
- Using the slide, discuss the duties of employers and employees in providing/ maintaining safe and clean work environment at work place.

## Notes for Facilitation

- Conclude the unit by calling for volunteers to sum up one by one the learning on importance of sanitizing the workplace, the procedure to sanitize and disinfect work area.
- Encourage active participation and engagement from students, such as through group discussions and hands-on exercises.
- Provide a balance of both theoretical and practical information on the use PPEs, Cleaning disinfectants and other objects needed in this process.
- Get participants to open up their participant handbooks and solve the exercises given at the end of the unit. Discuss the answers.

## Exercise



### Short Answer Type Questions

1. There are several ways to maintain personal hygiene:
  - Bathing regularly - daily showers or baths help keep the skin clean and refreshed.
  - Brushing teeth - brushing at least twice a day helps prevent cavities and gum disease.
  - Washing hands - frequent hand washing, especially before eating and after using the bathroom, helps prevent the spread of germs.
  - Trimming nails - keeping nails trimmed and clean can prevent the spread of bacteria and fungi under the nails.
  
2.
  - Hand hygiene - providing hand sanitizers and encouraging frequent hand washing to reduce the spread of germs.
  - Social distancing - implementing measures to keep employees at least 6 feet apart to reduce the spread of infectious diseases.
  - Cleanliness - regularly cleaning and sanitizing high-touch surfaces, such as desks, keyboards, and door handles, to reduce the spread of germs.
  - PPE - providing personal protective equipment, such as masks, gloves, and goggles, to employees who need it to do their jobs safely.
  - Ventilation - ensuring adequate ventilation in the workplace to reduce the concentration of airborne infectious agents.
  
3. Paying attention to housekeeping at work is important for several reasons:
  - Safety - A clean and well-organized workplace can help prevent accidents, such as slips, trips, and falls.
  - Health - A clean and sanitary workplace can reduce the spread of germs and illnesses, promoting a healthy work environment.
  - Productivity - A cluttered and disorganized workspace can lead to distractions and reduced efficiency, while a clean and organized workspace can improve focus and productivity.
  
4. Refer section 5.1.5 of PHB.







## Key Learning Outcomes

**After the completion of this unit, the participant will be able to:**

1. List the Personal Protective Equipment (PPE) required at the workplace.
2. Describe the commonly reported hazards at the workplace.
3. Describe the hazards caused due to chemicals/pesticides/fumigants.
4. Describe the basic safety checks to be done before the operation of any equipment/machinery.
5. Describe the common first aid procedures to be followed in case of emergencies.
6. State measures that can be taken to prevent accidents and damages at the workplace.
7. Explain the importance of reporting details of first aid administered, to the reporting officer/doctor, in accordance with workplace procedures.
8. State common health and safety guidelines to be followed at the workplace.

## UNIT 8.1: Emergency Procedures and First Aid

### Unit Objectives

After the completion of this unit, the participant will be able to:

1. Ensure prevention of accidents and damages.
2. Deal with accidents, fires and emergencies.
3. Use emergency evacuation.
4. Administer first aid.

### Resources to be Used

- Participant handbook, Presentation slides, Whiteboard, Markers, Pictures, Posters, Newspaper clippings, Laptop, Internet connection (if possible), fire extinguisher.

### Say

- Greet the participants and before beginning the session, recapitulate the previous session discussions.

### Activity

**Purpose:** To acquaint participants with the emergency situations that occur at the workplace.

**Resources:** Presentation slides.

**Methodology:** Quiz

**Expected Outcome:** Participants will be able to identify the emergency situations that can occur at the workplace.

- Show the presentation slides and ask the participants to identify the emergency situations one by one. Note their response.
- Post the Quiz, show the presentation slide with the correct answers.

### Explain

- An emergency can be a natural disaster or an accident. Workers can be involved in accidents at workplace, and these can be caused by the physical, biological or chemical hazards.
- There are three factors that contribute to accidents at the workplace chance occurrence, unsafe condition at the workplace and unsafe acts on the part of the employees.

## Team Activity

**Purpose:** To increase the knowledge of participants about the different factors that contribute to accidents at workplace.

**Resources:** Presentation slides

**Methodology:** Game

**Expected Outcome:** Ability to identify the factors that contribute to accidents at the workplace.

**Instructions:**

- First prepare 3 chits of paper. These will have one factor each that causes accidents. Select 3 participants and allot one chit each for factors:
  1. Chance occurrence
  2. Unsafe condition at the workplace and
  3. Unsafe acts on the part of the employees
- Prepare small chits which will contain the names of all the examples that come under the three main factors. You can refer to the Participant Handbook for all the examples. Jumble up the chits and keep them in a bowl. Ask participants to pick a chit from the bowl and then walk to the factor under which the example given occurs. Show the presentation slide and explain the factors and the examples.

## Say

- Chance occurrences include medical emergencies like heart attack, weather conditions like floods and storms, natural calamities like earthquakes and sudden power failures. Unsafe conditions at the workplace are the biggest cause of accident at workplace. These are also called 'technical causes or 'improperly guarded equipment'. Unsafe acts on the part of employees are tasks or acts that a worker performs without any knowledge or skill.

## Ask

- What do you understand by first aid?

## Activity

**Purpose:** To train the participants to administer first aid for different type of injuries and to understand the guidelines to be followed if a fire occurs.

**Resources:** Presentation slides, fire extinguisher

**Methodology:** Guest Lecture and Demonstration

**Expected outcome:**

Participants will gain basic knowledge on administering first aid for different types of injuries. Participants will be able to understand and follow the guidelines in case of a fire.

- Arrange for a guest lecture:
  1. To talk about first aid and demonstrate the steps to administer first aid for different type of injuries. Ask a few participants to volunteer and demonstrate the steps to administer first aid.
  2. To understand the guidelines to be followed in case of a fire. Ask a few participants to volunteer and demonstrate the steps to use a fire extinguisher and conduct a mock fire drill and evacuation.

## Notes for Facilitation



- Emphasize the importance of identifying and addressing potential hazards and risks in the workplace to prevent accidents and injuries.
- Ensure that all participants have the opportunity to practice the techniques during the training session and provide feedback.
- Emphasize the importance of following safety procedures and regulations, and the role of everyone in maintaining a safe work environment.
- Encourage participants to ask questions and share their experiences and concerns related to safety in the workplace.
- Get participants to open up their participant handbooks and solve the exercises given at the end of the unit. Discuss the answers.

## Exercise



### Key Solutions to PHB Exercises

- 1.
- 1) General hygiene steps in workplace include: regular hand washing, covering mouth while coughing or sneezing, avoiding sharing personal items, maintaining clean surfaces, and following personal protective equipment (PPE) guidelines.
- 2) Steps to deal with natural disasters include: preparing an emergency plan, having an emergency supply kit, staying informed of weather updates, following evacuation orders, and avoiding dangerous areas.
- 3) First aid is the initial medical treatment given to a person who has been injured or is suddenly taken ill, before professional medical help arrives.
- 4) Fire extinguisher categories are: Class A, Class B, Class C, Class D, and Class K.
- 5) Steps to use a fire extinguisher: 1) Pull out the safety pin, 2) Aim the nozzle at the base of the fire, 3) Squeeze the handle to release the extinguishing agent, 4) Sweep the nozzle back and forth to cover the entire fire area.
- 6) Steps for evacuation in case of fire: 1) Sound the alarm, 2) Evacuate the building immediately, 3) Close doors behind you, 4) Proceed to the nearest fire exit or designated assembly area
- 7) First aid steps for a fracture: 1) immobilize the injured area, 2) provide pain relief, 3) transport the person to a hospital, 4) do not try to realign the broken bone, 5) monitor for signs of shock.

### B. Fill in the blanks

1. Emergency evacuation
2. Fire Prevention plan (FPP)
3. First aid
4. Entrapment

### C. Multiple choice Questions

1. d
2. c







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National  
Skill Development  
Corporation

Transforming the skill landscape



## 10. Annexures

Annexure I - Training Delivery Plan

Annexure II- Assessment Criteria

Annexure III- QR Codes –Video Links



## Annexure I

### Training Delivery Plan

Training Delivery Plan			
Program Name:	Mushroom Grower (Entrepreneur)		
Qualification Pack Name & Ref. ID	AGR/Q7803		
Version No.	3.0	Version Update Date	17/11/2022
Pre-requisites to Training (if any)	Minimum Educational Qualification: 10th Class with 2 years of relevant experience OR 10th Class Pass and pursuing continuous regular schooling OR Previous relevant Qualification of NSQF Level- 3 with minimum education as 5th grade pass with 2 Years of relevant experience		
Training Outcomes	<p><b>At the end of the program, the learner should have acquired the listed knowledge and skills to:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate the process of selecting and preparing the site and sowing the pulse seed.</li> <li>• Demonstrate the process of carrying out macro and micronutrient management of field crops.</li> <li>• Describe the process of Process of managing the weed growth in crop field.</li> <li>• Demonstrate the Process of performing integrated pest and disease management for pulses.</li> <li>• Demonstrate the Process of performing irrigation management for field crops.</li> <li>• Demonstrate the process of carrying out harvesting, post-harvest processing and marketing of pulses.</li> <li>• Explain the basic entrepreneurial activities for small enterprise.</li> <li>• Describe the process of undertaking employability and entrepreneurial practices.</li> <li>• Describe the process of engaging in collective farming/activity.</li> <li>• Demonstrate various practices to maintain personal hygiene, cleanliness, and safety at the workplace.</li> </ul>		

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
1	Introduction T: 5:00 P: 0:00 (HH:MM)	1. Scope and Importance 2. Usage and Market demand	<ul style="list-style-type: none"> <li>• Explain general classroom rules</li> <li>• Discuss scope and importance of Mushroom cultivation in India</li> </ul>	Bridge Module	Team activity: Stage presentation and group discussion	Power point slides, charts, audio visual aid (e-skill india content)	T: 2:00
		2. Role and responsibility of mushroom grower	<ul style="list-style-type: none"> <li>• Recognise market demand</li> <li>• Explain job role and discuss the responsibilities</li> </ul>		Lecture, stage presentation, Demonstrations and group discussion	Chart, paper, pen, village map or map of service area. PPT	T: 3:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
2	Prepare & pasteurize the compost necessary to cultivate mushroom T: 20:00 P: 35:00 (HH:MM)	1.Selection of appropriate materials to prepare the compost-I	<ul style="list-style-type: none"> <li>Identify base materials from various agricultural by-products.</li> <li>Select materials for cellulose, hemi-cellulose and lignin being utilized by the mushroom.</li> <li>Identify materials with C:N ratio 1:10</li> <li>Select materials that act as a nutrient source</li> <li>Impart proper physical structure to the substrate.</li> </ul>	AGR/N7813, PC1, PC4, PC7, PC11, PC15, PC18, PC19, KU1-KU5, KU7, KU10-KU13, GS1-GS5, GS7, GS8	Lecture, demonstration, Group discussion	PPT, projector, laptop, paddy/wheat/mustard straw, etc., audio visual aid	T: 3:00 P: 4:00
		2.Selection of appropriate materials to prepare the compost-II	<ul style="list-style-type: none"> <li>Select materials that acts as a nutrient source,</li> <li>Impart proper physical structure to the substrate</li> <li>Check adequate aeration during composting, and add bulk to the compost</li> </ul>		Lecture, demonstration, activity	PPT, projector, laptop, paddy/wheat/mustard straw, etc., audio visual aid	T: 2:00 P: 4:00
		3.Chemical selection	<ul style="list-style-type: none"> <li>Select chemicals for rectifying the mineral deficiencies in the compost.</li> <li>Identify chemicals having stabilizing effect on ammonium content, serving as a calcium source for the mushroom and also for the oxalic acid produced by the mushroom mycelium</li> </ul>		Lecture, demonstration, hands on practice	PPT, chart, paper, pen, gypsum and calcium carbonate, etc.,	T: 3:00 P: 4:00
		4.Selection of tools	<ul style="list-style-type: none"> <li>Select tools required to produce compost</li> </ul>		Lecture, demonstration, activity	Appropriate tools, PPT, chart, paper pen	T: 2:00 P: 5:00
		5.Identify different types compost	<ul style="list-style-type: none"> <li>Compute different formulations of composting ingredients to achieve the required C:N ratio for mushroom compost</li> <li>Identify the types of compost (natural and synthetic)</li> </ul>		Lecture, demonstration, group participation, activity	Horse manure, wheat straw, chicken manure, urea, brewer's grain, paddy straw, bagasse, mustard straw and gypsum, calcium ammonium nitrate, urea, superphosphate, muriate of potash, wheat bran, molasses, gypsum and lindane dust	T: 3:00 P: 4:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
		6. Select the methods of composting	<ul style="list-style-type: none"> <li>Select method with respect to the availability of steam pasteurization</li> <li>Follow time interval to sprinkle water over the compost</li> <li>Determine the appropriate interval for compost rotation</li> <li>Store the agricultural by-products under cover</li> </ul>		Lecture, demonstration, group participation, activity	PPT, audio visual aids	T: 2:00 P: 5:00
		7. Pasteurization	<ul style="list-style-type: none"> <li>Pasteurize the compost to kill insects, nematodes, pest fungi, or other pests</li> </ul>		Facilitator led discussion, Demonstration	PPT, audio visual aids	T: 2:00 P: 5:00
		8. Post-work activities	<ul style="list-style-type: none"> <li>Identify attributes of a good compost</li> <li>Ensure safe work condition</li> <li>Report work related issues to responsible authority and seek guidance on how to rectify problems</li> <li>Keep tools and materials in appropriate storage area</li> </ul>		Facilitator led discussion, Demonstration	PPT, pen, paper, chart, dark brown compost	T: 3:00 P: 4:00
3	Procurement of inputs and preparation of the site for mushroom cultivation T: 20:00 P: 40:00 (HH:MM)	1. Select commercially important type of mushroom	<ul style="list-style-type: none"> <li>Select the type based on market demand, climatic conditions, growing season, investments etc.</li> <li>Collect mushroom spawns from reliable sources</li> <li>Select cost effective and economically beneficial species</li> <li>Identify the type with more shelf life</li> <li>Select freshly prepared spawns</li> </ul>	AGR/N7814 PC1, PC3, PC7, PC10, PC12, KU1-KU6, KU8, KU9, KU10, GS1-GS6, GS7	Class room lecture, facilitator led discussion, Demonstration, Field /market visit	PPT, pen, paper, chart, audio visual aids	T: 3:00 P: 4:00
		2. Select appropriate mushroom cultivation site	<ul style="list-style-type: none"> <li>Assess site based on requirements of land size, agro-climatic conditions, water resources, farm labor for construction, activities, drainage water facilities etc.</li> <li>Locate easily accessible site</li> <li>Identify hazards &amp; risks associated with mushroom farms</li> </ul>		Class room lecture, facilitator led discussion, Demonstration, Field /market visit	PPT, pen, paper, chart, audio visual aids	T: 2: 00 P: 5:0 0

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
		3. Plan and design mushroom farm	<ul style="list-style-type: none"> <li>Prepare and check the suitability of design and layout of the farm as per the growing conditions required for different kinds of mushrooms</li> </ul>		Class room lecture, facilitator led discussion, Demonstration, Field /site visit	PPT, pen, paper, chart, audio visual aids	T: 3: 00 P: 5:00
		4. Water availability and drainage facilities	<ul style="list-style-type: none"> <li>Check fresh water availability</li> <li>Check facility of drainage system for carrying out waste water</li> <li>Check labour cost</li> </ul>		Class room lecture, facilitator led discussion	PPT, pen, paper, chart, audio visual aids	T: 4: 00 P: 5:00
		5. Tools and equipment	<ul style="list-style-type: none"> <li>Identify various types of tools, equipment, material and machinery for construction of mushroom farms</li> </ul>		Lecture, demonstration	PPT, pen, paper, chart, audio visual aids	T: 2:00 P: 6:00
		6. Quality of mushroom and construction techniques	<ul style="list-style-type: none"> <li>Identify types, components and their specifications of bulk chamber conducive for good quality mushroom growing.</li> <li>Use safe and reliable construction techniques to build required fixtures</li> </ul>		Lecture, demonstration	PPT, pen, paper, chart	T: 3:00 P: 5:00
		7. Cultivation methods	<ul style="list-style-type: none"> <li>Use crop rotation method for mushroom cultivation</li> </ul>		Lecture, demonstration	PPT, pen, paper, chart	T: 1:00 P: 6:00
		8. Recap	<ul style="list-style-type: none"> <li>Recapitulate complete module learning</li> </ul>		Lecture, activities, role plays, group presentations and discussion, field visits, demonstrations etc.	PHB, projector, display screen, white board, marker, duster, paper, pen PPT and relevant audio-visual aids	T: 2:00 P: 4:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
4	Process of Mushroom Cultivation T: 25:00 P: 65:00 (HH:MM)	1. Types of spawning	<ul style="list-style-type: none"> <li>Different methods of spawning mushroom seeds such as spot spawning, surface spawning, layer spawning, etc.</li> </ul>	AGR/N7815 PC1, PC6, PC10, PC13, PC15, PC18, PC19, PC21, PC24, PC26, KU1-KU8, KU10, KU12, GS1-GS6, GS8	Lecture, stage presentation, role plays, group presentations and discussion	PHB, White board, duster, flip chart board/paper etc., Slides in power point presentation	T: 3:00 P: 5:00
		2. Spawning materials- I	<ul style="list-style-type: none"> <li>Various materials required for spawning and preparing casing soil</li> </ul>		Lecture, stage presentation, learning by doing, group presentations and discussion, field visits	PHB, White board, duster, flip chart board/paper etc., ppt, weeds varieties available locally	T: 2:00 P: 5:00
		3. Spawning materials- II	<ul style="list-style-type: none"> <li>Practical session on hands on materials used for spawning</li> </ul>		Class room lecture, facilitator led discussion		T: 1:00 P: 7:00
		3. Casing soil- I	<ul style="list-style-type: none"> <li>Describe the process of preparing casing soil</li> </ul>		Lecture, stage presentation, role plays, group presentations and discussion	PHB, white board, duster, flip chart board/paper etc., Slides in power point presentation showing relevant images of herbicides commonly used	T: 2:00 P: 4:00
		4. Casing soil- II	<ul style="list-style-type: none"> <li>Demonstration of preparation of casing soil</li> </ul>		Lecture, stage presentation, role plays, group presentations and discussion	PHB, White board, duster, flip chart board/paper etc., Slides in power point presentation	T: 1:00 P: 7:00
		5. Casing soil- III	<ul style="list-style-type: none"> <li>Hands on practice on preparing casing soil</li> </ul>		Class room lecture, facilitator led discussion	PPT, pen, paper, chart, audio visual aids	T: 1:00 P: 7:00
		6. Compost turning	<ul style="list-style-type: none"> <li>Describe the importance and process of compost turning</li> </ul>		Lecture, Stage presentation, group discussion	PHB, Projector, display screen, round table sitting arrangement, white board, duster	T: 2:00 P: 4:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
		7. Temperature, pH, and relative humidity of mushroom cultivation	<ul style="list-style-type: none"> <li>Explain the importance of maintaining the recommended temperature, potential of Hydrogen and relative humidity during mushroom cultivation</li> </ul>		Group discussion, notes making, field visit	Notebook, pen, tools for weeding,	T: 2:00 P: 3:00
		8. Formation of compost and vermi-compost-I	<ul style="list-style-type: none"> <li>Explain recycling of mushroom waste</li> </ul>		Lecture, stage presentation, role plays, group presentations and discussion, field visits	PHB, White board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 2:00 P: 3:00
		9. Formation of compost and vermi-compost-II	<ul style="list-style-type: none"> <li>Demonstrate recycling of mushroom waste</li> </ul>		Lecture, stage presentation, role plays, group presentations and discussion, field visits	PHB, White board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 1:00 P: 7:00
		10. Application of mushroom substrate	<ul style="list-style-type: none"> <li>Explain the application of mushroom substrate</li> <li>Explain the problems associated with mushroom substrate</li> </ul>		Lecture, stage presentation, role plays, group presentations and discussion, field visits	PHB, White board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 2:00 P: 4:00
		11. Mushroom Spawning-Practical	<ul style="list-style-type: none"> <li>Hands on practice on different methods discussed in "Spawning in Mushroom"</li> </ul>		Lecture, stage presentation, discussion and field visit	PHB, White board, duster, flip chart board/paper etc., ppt, audio visual aids and handouts of action plans.	T: 1:00 P: 7:00
		8. Recap	<ul style="list-style-type: none"> <li>Recapitulate complete module learning</li> </ul>		Lecture, activities, role plays, group presentations and discussion, field visits, demonstrations etc.	PHB, projector, display screen, white board, marker, duster, paper, pen PPT and relevant audio-visual aids	T: 5:00 P: 2:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
5	Process of maintaining, harvesting and processing mushroom T: 20:00 P: 40:00 (HH:MM)	1. Identify quality of mushrooms	<ul style="list-style-type: none"> <li>Select young and healthy mushrooms</li> <li>Assess the maturity of a mushroom</li> <li>Select mushrooms from medium- to large-size</li> </ul>	AGR/N7816 PC2, PC4, PC5, PC7, PC10, PC11, PC16, PC17, KU1, KU3-KU5, KU8, KU10-KU12, GS1-GS5, GS7, GS9	Lecture, demonstration	PPT, charts, audio-visual aids	T: 3:00 P: 3:00
		2. Harvesting procedure	<ul style="list-style-type: none"> <li>Identify harvest periods, during the cropping cycle</li> <li>Apply good harvesting practices w.r.t. temperature relative humidity</li> <li>Follow the appropriate plucking procedure to prevent contamination</li> </ul>		Lecture, demonstration, field visit	PPT, charts, audio-visual aids	T: 2:00 P: 5:00
		3. Methods of harvesting	<ul style="list-style-type: none"> <li>Identify various types of mushrooms and their methods of harvesting</li> </ul>		Lecture, demonstration, field visit	PPT, charts, audio-visual aids	T: 1:00 P: 4:00
		4. Cut, sort and dry harvested mushroom using approved procedures	<ul style="list-style-type: none"> <li>Use approved cutting techniques for harvesting</li> <li>Use approved cleaning methods to remove soil particles, compost, and other foreign materials,</li> <li>Remove the water content from the mushroom</li> <li>Sort and grade the harvests as per required quality specifications</li> </ul>		Lecture, demonstration, field visit	PPT, charts, polypropylene bag, non-waxed paper bag, labels, weighing machine, sealing machine	T: 3:00 P: 4:00
		5. Tools and materials for harvesting, packaging, storage and transport of mushrooms	<ul style="list-style-type: none"> <li>Identify appropriate tools and materials used in harvesting, packaging, storage and transport of mushrooms</li> </ul>		Lecture, demonstration,	PPT, charts, polypropylene bag, non-waxed paper bag, labels, weighing machine, sealing machine	T: 2:00 P: 5:00
		6. Storage of produce	<ul style="list-style-type: none"> <li>Store freshly harvested mushrooms at recommended temperature</li> <li>Protect the storage area from direct sunlight, and contamination</li> </ul>		Lecture, demonstration, field visit	PPT, charts, audio-visual aids Polypropylene bag, non-waxed paper bag, labels, weighing machine, sealing machine Audio-visual aids, charts, pen, paper etc.	T: 2:00 P: 5:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
		7.Critical growth stages of pulse crops and irrigation scheduling-II	<ul style="list-style-type: none"> <li>Explain the recommended practices to prevent under irrigation.</li> <li>Explain recommended practices for effective drainage</li> </ul>		Lecture, stage presentation, role plays, group presentations and discussion, field visits	PHB, pen/pencil, notebook, checklist for visit, white board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 3:00 P: 5:00
		8.Packing of mushrooms	<ul style="list-style-type: none"> <li>Pack the mushrooms in bags of different capacities and recommended standards for sale</li> </ul>		Lecture, demonstration,	PPT, labels, weighing machine, sealing machine, marker	T: 2:00 P: 4:00
		9. Recap	<ul style="list-style-type: none"> <li>Recapitulate complete module learning</li> </ul>		Lecture, activities, role plays, group presentations and discussion, field visits, demonstrations etc.	PHB, projector, display screen, white board, marker, duster, paper, pen PPT and relevant audio-visual aids	T: 2:00 P: 5:00
6	Basic entrepreneurial activities for small enterprise T: 15:00 P: 15:00 (HH:MM)	1. Follow the employability practices	<ul style="list-style-type: none"> <li>Explain the process for resume and interview preparation</li> <li>Describe work culture, organizational workplace duties</li> <li>Explain the stress management practices at a workplace</li> </ul>	AGR/N9908 PC1-PC3, PC6, PC7, PC11, PC13, PC15, PC18, PC23, PC27, KU1-KU7, KU10-KU12, KU14, KU17-KU21, KU22, KU24, GS1-GS5, GS8	Lecture, stage presentation, role plays, group presentations and discussion, field visits	PHB, pen/pencil, notebook, checklist for visit, white board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 4:00 P: 3:00
		2. Efficient digital skills	<ul style="list-style-type: none"> <li>Describe computer and related digital know how in the organization</li> <li>Describe the appropriate e-commerce platforms in business activities</li> </ul>		Lecture, demonstration, field visit	PHB, projector, display screen, white board, marker, duster, paper, pen PPT and relevant audio-visual aids	T: 3:00 P: 5:00
		3. Ensuring Entrepreneurial practices	<ul style="list-style-type: none"> <li>Explain good banking and insurance practices to be adopted by the employees.</li> <li>Explain the recommended practice for stable enterprise and risk mitigation.</li> <li>Describe employee motivation at work.</li> </ul>		Lecture, stage presentation, role plays, group presentations and discussion, demonstration.	PHB, pen/pencil, notebook, checklist for visit, white board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 4:00 P: 3:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
		4. Recap	<ul style="list-style-type: none"> <li>Recapitulate complete module learning</li> </ul>		Lecture, activities, role plays, group presentations and discussion, field visits, demonstrations etc.	PHB, projector, display screen, white board, marker, duster, paper, pen PPT and relevant audio-visual aids	T: 4:00 P: 4:00
7	Hygiene and cleanliness T: 03:00 P: 03:00 (HH:MM)	1. Hygiene and workplace housekeeping	<ul style="list-style-type: none"> <li>Explain the requirements of personal health, hygiene and fitness at work</li> <li>Explain importance of housekeeping at work</li> <li>Describe common health related guidelines laid down by organization at workplace.</li> </ul>	AGR/N9903 PC1-PC4, PC10, PC12, PC13, KU1- KU7, GS1- GS6, GS8	Lecture, role plays, group presentations and discussion	PHB, pen/pencil, notebook, checklist for visit, white board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 3:00 P: 3:00
8	Safety and emergency procedures T: 12:00 P: 12:00 (HH:MM)	1. Emergency procedures and first aid- I	<ul style="list-style-type: none"> <li>Ensure prevention of accidents and damages</li> <li>Deal with accidents, fires and emergencies</li> </ul>	AGR/N9903 PC16-PC19, KU8-KU17, GS1-GS6, GS8, GS9	Lecture, stage presentation, role plays, group presentations and discussion, field visits	PHB, pen/pencil, notebook, checklist for visit, white board, duster, flip chart board/paper etc., slides in power point presentation showing relevant images	T: 5:00 P: 3:00
		1. Emergency procedures and first aid- II	<ul style="list-style-type: none"> <li>Use emergency evacuation</li> <li>Administer first aid</li> </ul>		Activities, role plays, group presentations and discussion, field visits, demonstrations etc.	PHB, projector, display screen, white board, marker, duster, paper, pen PPT and relevant audio-visual aids etc.	T: 3:00 P: 5:00
		4. Recap	<ul style="list-style-type: none"> <li>Recapitulate complete module learning</li> </ul>		Lecture, activities, role plays, group presentations and discussion, field visits, demonstrations etc.	PHB, projector, display screen, white board, marker, duster, paper, pen PPT and relevant audio-visual aids	T: 4:00 P: 4:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
9.	Employability Skills (60hrs)	Introduction to Employability Skills	<ul style="list-style-type: none"> <li>Describe importance of Employability Skills</li> <li>Prepare a note on different industries, trends, required skills</li> </ul>	DGT/VSQ /N0102	Classroom lecture, Team Activity	White-Board and, Markers, Chart Paper and Sketch pens, LCD Projector	1:30
		Constitutional Values: Citizenship	<ul style="list-style-type: none"> <li>Detail the principles of constitution of India</li> <li>Identify the various environmentally sustainable practices</li> </ul>		Classroom lecture, Team Activity	Laptop, PPT, White board Markers, note pad, pen etc.	1:30
		Becoming a Professional in the 21st Century	<ul style="list-style-type: none"> <li>Discuss relevant 21st century skills required for employment</li> <li>Practice critical thinking and decision making skills</li> </ul>		Classroom lecture, Team Activity	Laptop, PPT, White board Markers, note pad, pen etc.	2:30
		Basic Skills-I	<ul style="list-style-type: none"> <li>Read English text with appropriate articulation</li> <li>Practice basic English words, sentences, punctuation</li> </ul>		Classroom lecture, Team Activity, Role play, video session	Laptop, PPT, White board Markers, note pad, pen etc.	5:00
		Basic Skills-II	<ul style="list-style-type: none"> <li>Demonstrate active listening and reading skills</li> </ul>				Practical, demonstration, role play
		Career Development and Goal Setting	<ul style="list-style-type: none"> <li>Identify well-defined short- and long-term goals</li> <li>Explain how to build a career pathway</li> <li>Conduct job market research</li> <li>Discuss how to set career goals.</li> </ul>	DGT/VSQ /N0102	Class room lecture, discussion, demonstration, practical	Laptop, PPT, White board Markers, note pad, pen etc.	2:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Trainin g Tools / Aids	Duration
		Communication Skills	<ul style="list-style-type: none"> <li>Explain the importance of communication at workplace</li> <li>Demonstrate effective communication strategies</li> <li>Demonstrate how to communicate effectively using verbal and nonverbal communication</li> </ul>	DGT/VSQ /N0102	Class room lecture, discussion, demonstration, practical	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	5:00
		Diversity and Inclusion	<ul style="list-style-type: none"> <li>Explain the need of diversity at workplace</li> <li>Identify the various PwD policies applicable at workplace</li> <li>Discuss the significance of the POSH Act</li> </ul>	DGT/VSQ /N0102	Class room lecture, Inter-active discussion	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	2:30
		Financial and Legal Literacy	<ul style="list-style-type: none"> <li>Discuss various financial institutions, products, and services</li> <li>Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), tax deductions</li> </ul>	DGT/VSQ /N0102	Class room lecture, demonstrations, group discussion, practical	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	5:00
		Essential Digital Skills-I	<ul style="list-style-type: none"> <li>Detail the use and features of various MS Office tools, like MS Word, MS Excel, MS PowerPoint, etc.</li> <li>Demonstrate how to operate digital devices</li> <li>Create an e-mail id and follow e- mail etiquette to exchange e -mails</li> <li>Describe the role of digital technology in day-to-day life and the workplace</li> </ul>	DGT/VSQ /N0102	Class room lecture, discussion, Demonstration, practical, learning by doing	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	6:00
		Essential Digital Skills-II	<ul style="list-style-type: none"> <li>Practice Digital skills</li> </ul>		Demonstration, practical, learning by doing		4:00

S.No.	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools / Aids	Duration
		Entrepreneurship	<ul style="list-style-type: none"> <li>Describe the types of entrepreneurship and enterprises</li> <li>Describe the 4Ps Of Marketing- Product, Price, Place and Promotion and Apply the mas Per requirement</li> <li>Create a sample Business plan, For the selected business</li> </ul>	DGT/VSQ /N0102	Class room lecture, discussion, Demonstration, practical	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	7:00
		Customer Service	<ul style="list-style-type: none"> <li>Identify types of customers and how to deal with them</li> <li>Identify methods to get customer feedback and how to implement them</li> <li>Explain various tools used to collect customer feedback</li> <li>Discuss the significance of maintaining hygiene and dressing appropriately</li> </ul>	DGT/VSQ /N0102	Class room lecture, activity, role play, video session	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	5:00
		Apprenticeships and Jobs	<ul style="list-style-type: none"> <li>Practice personal grooming strategies</li> <li>Illustrate the use of online platforms for job hunting</li> <li>Detail the concept of Apprenticeship</li> <li>Demonstrate how to enroll for Apprenticeship programs.</li> <li>Draft a professional Curriculum Vitae (CV)</li> <li>Role play a mock interview</li> </ul>	DGT/VSQ /N0102			8:00

## Annexure II

### Assessment Criteria

#### CRITERIA FOR ASSESSMENT OF TRAINEES

(For Updated 'Assessment Criteria', please refer to Qualification Pack of this Job role available at <https://www.nqr.gov.in/>)







Assessment Criteria for ASCI- Mushroom Grower (Entrepreneur)	
Job Role	Mushroom Grower (Entrepreneur)
Qualification Pack	AGR/Q7803
Sector Skill Council	Agriculture






S.No.	Guidelines for Assessment
1.	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2.	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3.	Assessment will be conducted for all compulsory NOS, as well as the selected elective NOS/set of NOS.
4.	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5.	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria.
6.	To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7.	In case of <i>unsuccessful completion</i> , the trainee may seek reassessment on the Qualification Pack.

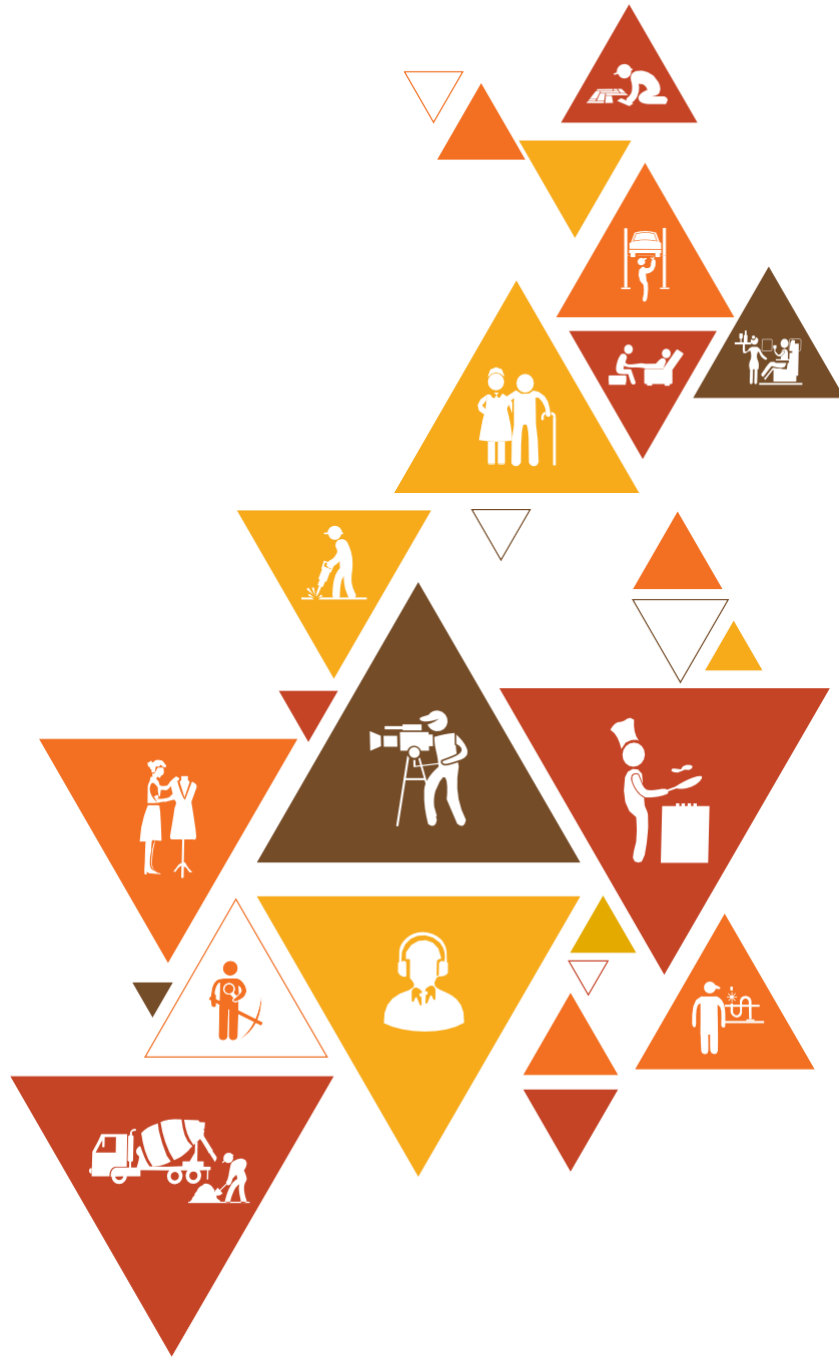
National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N7813.Prepare and pasteurise mushroom compost	30	40	-	30	100	25
AGR/N7814.Procure inputs and prepare the site for mushroom cultivation	30	40	-	30	100	25
AGR/N7815.Carry out mushroom cultivation	30	40	-	30	100	15
AGR/N7816.Maintain, harvest and process mushroom	30	40	-	30	100	20
AGR/N9908.Undertake basic entrepreneurial activities for small enterprise	30	40	-	30	100	5
AGR/N9903.Maintain health and safety at the workplace	40	25	-	35	100	5
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	5
<b>Total</b>	<b>210</b>	<b>255</b>	<b>-</b>	<b>185</b>	<b>650</b>	<b>100</b>

### Annexure-III

#### QR Codes –Video Links

Chapter No.	Unit No.	Topic	QR Code Links	QR code (s)
<b>Chapter -1</b> Introduction to the Role of a Mushroom Grower (Entrepreneur)	Unit 1.1 - Introduction to Mushrooms	Mushroom Cultivation a Boom for Doubling Farmers' Income	<a href="https://www.youtube.com/watch?v=bXP1moQ1upo">https://www.youtube.com/watch?v=bXP1moQ1upo</a>	 Boom for Doubling Farmers' Income
		Mushroom Cultivation	<a href="https://www.youtube.com/watch?v=oormRweSf3E&amp;t=499s">https://www.youtube.com/watch?v=oormRweSf3E&amp;t=499s</a>	 Mushroom Cultivation
		Orientation of Mushroom Grower Job role	<a href="https://www.youtube.com/watch?v=PfQDvLOHiGA">https://www.youtube.com/watch?v=PfQDvLOHiGA</a>	 Orientation of Mushroom Grower Job role
<b>Chapter-2</b> Preparation and Pasteurization of Mushroom Compost	Unit 2.4 - Preparation of Substrate for Paddy Straw Mushroom, Oyster and Milky Mushroom	Oyster Mushroom Cultivation Step 1   Sterilization of straw	<a href="https://www.youtube.com/watch?v=GHBsa1Ju04w">https://www.youtube.com/watch?v=GHBsa1Ju04w</a>	 Oyster Mushroom Cultivation
<b>Chapter -4</b> Mushroom Cultivation Process	Unit 4.1 - Spawning in Mushrooms	Spawning Process	<a href="https://www.youtube.com/watch?v=VIWguSPk8y8">https://www.youtube.com/watch?v=VIWguSPk8y8</a>	 Spawning Process
	Unit 4.2 - Utilization of Spent Mushroom Substrate	Management of Spent Substrate of Various Mushrooms	<a href="https://www.youtube.com/watch?v=Zc-uQydy7PA">https://www.youtube.com/watch?v=Zc-uQydy7PA</a>	 Spent Substrate of Various Mushrooms

Chapter No.	Unit No.	Topic	QR Code Links	QR code (s)
Chapter-5 Mushroom Handling, Harvesting and Processing	Unit 5.1 - Various Diseases; Indicator Molds, Fungal, Bacterial, Viral Diseases, Various Insects Affecting Mushrooms	Mushroom disease Management	<a href="https://www.youtube.com/watch?v=3ym0V-Difgo">https://www.youtube.com/watch?v=3ym0V-Difgo</a>	 Mushroom disease Management
		Insect Pests Management in Cultivated Mushroom	<a href="https://www.youtube.com/watch?v=45dGAEd2uAo">https://www.youtube.com/watch?v=45dGAEd2uAo</a>	 Insect Pests Management in Cultivated Mushroom
		Mushroom Fly & Larvae Problem Solution	<a href="https://www.youtube.com/watch?v=AHfx3CLXt-U">https://www.youtube.com/watch?v=AHfx3CLXt-U</a>	 Mushroom Fly & Larvae Problem Solution
	Unit 5.2 - Organic Mushroom Cultivation	Organic Oyster & Milky Mushroom Cultivation	<a href="https://www.youtube.com/watch?v=YcE5EqmDfLw">https://www.youtube.com/watch?v=YcE5EqmDfLw</a>	 Organic Oyster & Milky Mushroom Cultivation
	Unit 5.4 - Sun Drying and Pickling Mushrooms	Value Addition of Mushrooms	<a href="https://www.youtube.com/watch?v=vtY2kGq9TgY">https://www.youtube.com/watch?v=vtY2kGq9TgY</a>	 Value Addition of Mushrooms





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**ASCI**

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