



14

HEALTH AND SAFETY AT WORKPLACE

In the earlier lessons you have learnt that hygiene and clean environment is necessary to check diseases and get good yields. In addition to getting higher productivity of the crop, such environment is also a must for the safety of the workers. It is important to maintain a clean and efficient workplace for better efficiency of the workers. For safety of the workers it is mandatory that appropriate emergency procedures for general safety and First Aid are in place. Detailed information about the persons and agencies to be contacted in case of emergency must also be displayed clearly so that response time in case of emergency can be minimised.



OBJECTIVES

After reading this lesson you will be able to

- recognise the importance of standard practices in mushroom cultivation;
- identify the health hazards during mushroom cultivation;
- take proper precautions and the facilities required at the unit;
- relate as why you should not collect and consume wild mushrooms.

14.1 STANDARD OPERATING PROCEDURES (SOP'S) FOR CULTIVATION OF MUSHROOMS

It is important to know and follow the standard operating procedures at different steps of mushroom cultivation. By doing so you achieve the following:



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- You can enhance your operation's profitability and reduce the need for expensive and time-consuming systems
- Your farm will operate according to the highest environmental standards, and it will help improve coexistence with nearby residents.
- Your mushroom unit will actually help maintain or improve the condition of your soil, and prevent the pollution of surface water, groundwater and air, as well.
- It will mean a clean and efficient workplace that will produce better results.

While making compost we can feel smell and at times neighbours around you may not be comfortable with it. Further, even during and after cultivation lot of waste is generated. It can lead to environmental pollution if we do not follow the proper methods of disposal. With increasing awareness about environmental issues it is important that right practices are followed so that there are no problems for self and neighbours and there is no violation of regulatory issues. Every mushroom grower should follow standard farm practices for avoiding water pollution or odours. He should properly dispose the waste from mushroom growing operations, including mushroom compost. In addition to odour and waste (both runoff water from compost, cropping rooms and also the spent mushroom compost), it is important to have an emergency preparedness plan. It is important to use only recommended chemicals and pesticides to conform to food safety and environment safety regulations. Above all we need to maintain a clean workplace for higher efficiency of the unit (Fig 14.1).



Fig. 14.1: Not only workers, but also the visitors are supposed to wear protective clothing while visiting a commercial unit and fire safety equipment should be in place



INTEXT QUESTIONS 14.1

Answer the following questions

- (i) SOP stands for
 - (a) Some other Process
 - (b) Standard of Procedures
 - (c) Standard Operating Procedures
 - (d) Sum of Processes
- (ii) By implementing SOPs, you enhance your operation's profitability and reduce the need for expensive and time-consuming systems. (True/False)
- (iii) Following SOP will improve the condition of your soil, and prevent the pollution of surface water, groundwater and air, as well. (True/False)

14.2 ABOUT HEALTH, ALLERGIES AND BASIC FACILITIES TO WORKERS

For better health of self, workers and the unit it is important to understand about health hazards at different steps of mushroom cultivation. We should also know about the facilities that are required by the workers and also know that some people can be allergic to some specific mushroom spores.

14.2.1 About Health and Allergies

We have seen that during cultivation of mushrooms we need to take precautions at all stages. We also need precautions to ensure safety of the workers. Some of the precautions required for this are:

- Use masks and gum boots while preparing the compost.
- Use proper protective clothings as the compost can be hot, can have excessive ammonia and at times temperature can reach up to 75-80°C.
- Use disinfectants before spawning. It is useful both for the crop and the workers.
- In spawn run rooms which are at times kept closed, the carbon dioxide can reach up to 10000 ppm which can be fatal for human beings. So before starting the casing in such rooms, the fresh air should be introduced.



Notes



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- Use gloves while harvesting the mushrooms to ensure hygiene.
- Use racks with width of 4.5 feet or less. If width is more, workers will have to do excessive bending for prolonged periods while performing operations like casing, watering, harvesting. This can lead to problems of spine.
- Some workers can be allergic to the spores released by mushrooms. This is particularly important in case of oyster mushroom which produces lot of spores. Such workers should not be allowed to work in cropping rooms or mushroom packaging.
- Ensure that basic medical facilities and first aid box is always available at the unit.
- Water is sprayed frequently in the cropping rooms and humidity is high. It is important that electric fittings are in accordance to these conditions.

14.2.2 Basic Facilities to Workers

Providing certain basic facilities is in the interest of the workers as well as crop. We should provide basic facilities like washrooms and rooms for overnight stay and rest as there are operations that are performed round the clock like pasteurisation and conditioning of compost in tunnels; maintenance of temperature and humidity in cold room and cropping room.

We should also provide high quality bath rooms at entrance for male and female workers where all the workers are asked to take bath using disinfectant soap and change the clothes with the pre-sterilised clothes and also change foot wear before entering the spawn lab or cropping rooms.



INTEXT QUESTIONS 14.2

State True or False

- (i) It is must to have night stay facilities with separate arrangements for gents and ladies.
- (ii) Width of the rack that can be approached from both sides can be up to six feet.
- (iii) It is important to wear masks as some workers can be allergic to mushroom spores.



14.3 SAFETY PRACTICES AT WORK PLACE, PRECAUTIONS AGAINST FIRE AND OTHER HAZARDS

It is important to understand that what and what type of safety procedures are required at the mushroom unit and also know that we should use carbon dioxide sensors not only for crop but also for the safety of human beings.

Some Do's and Don'ts are:

- Seasonal cultivation is done in huts made using paddy straw and here fire safety is very important. Hence any activity like smoking, burning fire for cooking in open or even electric fittings likely to cause short circuit should not be undertaken near these huts. We may keep adequate distance between the huts for fire safety and other operations.
- Standard fire safety system is a must in commercial houses. Particular care may be taken in case of electric fittings.
- For safety of the crop and your own safety, always maintain the hygiene and follow the practices recommended for this. This may include use of disinfectants, use of protective clothing, etc.
- Use carbon dioxide sensors in cropping rooms. This will not only ensure a good crop but also ensure that workers may not have to work for long hours under high CO₂. This is important in spawn running rooms which if kept fully closed, the CO₂ level can reach lethal limits.



INTEXT QUESTIONS 14.3

State True or False

- (i) Very high carbon dioxide in closed rooms just before casing can be harmful to humans.
- (ii) Fire safety is required only in commercial units.
- (iii) Use of protective clothing is must for maintaining hygiene in cropping rooms.

14.4 WILD MUSHROOMS AND MUSHROOM POISONING

We must know that all mushrooms occurring in the wild are not edible and in fact some poisonous mushrooms resemble with edible mushroom at early stage. We



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cannot tell if a mushroom is poisonous only by looking at it. There are many myths about poisonous mushrooms:

- Coloured mushrooms are poisonous. But this is not true as many edible mushrooms are coloured.
- Insects and animals do not eat toxic mushrooms. It is not true as many highly poisonous mushrooms are infected by larvae. What is poisonous to humans may not be poisonous to insects or other animals.
- Silver coin will turn black when rubbed with a mushroom if it is poisonous. It is not true as no mushroom toxin is reported to react with silver.
- Poisonous mushrooms have bad odour and taste. Not necessary.

Majority of mushroom poisonings are not fatal. However, some mushrooms like *Amanita phalloides* are lethal. Of the most lethal mushrooms, three – the death cap (*A. phalloides*), destroying angels (*A. virosa* and *A. bisporigera*), and the fool’s mushroom (*A. verna*) – belong to the genus *Amanita*. For more details visit:

https://en.wikipedia.org/wiki/Mushroom_poisoning.

All mushrooms are not equally poisonous. Some may be poisonous when taken raw; others may become edible after parboiling while few others may be poisonous if taken along with alcohol as briefed in the figure below (Fig. 14.2).

Some mushrooms are poisonous	
When eaten raw	<i>Clitocybe nuda</i>
When eaten in large quantity	<i>Verpa bohemica</i>
Unless parboiled & fully cooked	<i>Gyromitra esculenta</i>
Only under certain conditions - with alcoholic beverages	<i>Coprinus atramentarius</i>
Regardless of the manner of preparation	<i>Amanita phalloides</i>
Hallucinogenic	<i>Psilocybe semilanceata</i>

Fig. 14.2: Different types of poisoning by mushrooms

Many deaths occur every year in North East part of India by consumption of wild mushrooms. Major culprit is *Amanita phalloides* as its shape in early stages of growth is somewhat similar to paddy straw mushroom.



INTEXT QUESTIONS 14.4

State True or False

- (i) All coloured mushroom are poisonous.
- (ii) Mushrooms that are eaten by insects are also safe for human consumption.
- (iii) *Amanita phalloides* is highly lethal mushroom.



WHAT YOU HAVE LEARNT

Let us recapitulate the important points we have learnt in this lesson.

- Output will be much higher and of better quality if SOPs are followed. With increase in concerns about environment, it will be mandatory to follow some of these procedures.
- Some persons can be allergic to spores and it is more so in case of Oyster mushroom that produces large amount of spores.
- Human beings cannot tolerate very high amount of carbon dioxide and hence care should be taken.
- Design of beds from which mushrooms are to be harvested should be such that there is no undue stress on the backbone or other parts of the body.
- There should be a display Do's and Don'ts at prominent place in local language.
- Telephone number of fire brigade, hospital, ambulance should also be displayed.
- All mushrooms are not edible and every year many people die due to consumption of wild mushrooms.



TERMINAL EXERCISE

1. Why it is important to follow standard operating procedures?
2. List five precautions that should be followed at mushroom unit.
3. List five Do's and Don'ts that should be followed at mushroom unit.



Notes

4. Why it is not safe to eat wild mushrooms? Can we visually tell if a mushroom is poisonous or not?
5. Describe different types of mushroom poisoning.



ANSWERS TO INTEXT QUESTIONS

14.1

- (i) (c) (ii) True (iii) True

14.2

- (i) True (ii) False (iii) True

14.3

- (i) True (ii) False (iii) True

14.4

- (i) False (ii) False (iii) True

SUGGESTED ACTIVITY

Visit a nearest seasonal and commercial mushroom unit and make a list of SOPs not being followed. Make a list of recommendations for these units necessary for the improvement of crop, workers and environment.

Key Learning Outcomes

- Maintain a clean and efficient workplace.
- Practice general safety and First Aid and render appropriate emergency procedures.