V Semester

Course 15 A: Mushroom Culture Technology

Credits -3

I. Learning Objectives: By the end of this course the learner has:

1. To learn about the morphology and nutritional value of some edible mushrooms.
2. To gain knowledge on basic requirements for establishing a mushroom culture unit.
3. To learn the cultivation methods and management practices specific to certain edible mushrooms.

II. Learning Outcomes: Students at the successful completion of the course will be able to: 1. Understand the structure and life of a mushroom and discriminate edible and poisonous mushrooms.

2. Identify the basic infrastructure to establish a mushroom culture unit.
3. Demonstrate skills preparation of compost and spawn.
4. Acquire a critical knowledge on cultivation of some edible mushrooms.
5. Explain the methods of storage, preparation of value-added products and marketing.

III. Syllabus of Theory:

Unit – 1: Introduction and value of mushrooms 8 Hrs.

1. Mushrooms: Definition, structure of a mushroom and a brief account of life cycle; historical account and scope of mushroom cultivation; difference between edible and poisonous mushrooms.

3. Morphological features of edible mushrooms - Button mushroom (*Agaricus bisporus*), Milky mushroom (*Calocybe indica*), Oyster mushroom (*Pleurotus sajor-caju*) and Paddy straw mushroom (*Volvariella volvacea*).
4. Nutraceutical value of mushrooms; medicinal mushrooms in South India (*Ganoderma lucidum, Phellinus rimosus, Pleurotus florida and Pleurotus pulmonaris*) and their therapeutic value; Poisonous mushrooms - harmful effects.

Unit – 2: Basic requirements of cultivation system 9 Hrs.

1. Small village unit and larger commercial unit; layout of a mushroom farm - location of building plot, design of farm, bulk chamber, composting, equipment and facilities, pasteurization room and growing rooms.
2. Compost and composting: Definition, machinery required for compost making, materials for compost preparation.
3. Methods of composting- long method of composting and short method of composting.

Unit – 3: Spawning and casing **10 Hrs.**

1. Spawn and spawning: Definition, facilities required for spawn preparation; preparation of spawn substrate.
2. Preparation of pure culture, media used in raising pure culture; culture maintenance, storage of spawn.
3. Casing: Definition, Importance of casing mixture, Quality parameters of casing soil, different types of casing mixtures, commonly used materials.

Unit – 4: Mushroom cultivation **10 Hrs.**

Raw material, compost, spawning, casing, cropping, and problems in cultivation (diseases, pests and nematodes, weed molds and their management strategies), picking and packing of the following mushrooms:

(a) Button mushroom (b) Oyster mushroom (c) Milky mushroom and (d) Paddy straw mushroom

Unit – 5: Post harvest technology **8 Hrs.**

1. Shelf life of mushrooms; preservation of mushrooms - freezing, dry freezing, drying and canning.
2. Quality assurance and entrepreneurship - economics of different types of mushrooms; value added products of mushrooms.
3. Management of spent substrates and waste disposal of various mushrooms.

IV. Text Books:

1. Tavis Lynch (2020) Mushroom Cultivation: An Illustrated Guide to Growing Your Own Mushrooms at Home, Rockridge Press, Emeryville, California, USA
2. Chang, P. and C. P. Bhatnagar (2003) Mushrooms: Cultivation, Nutritional Value, Medicinal Effect, and Environmental Impact, CRC Press, Boca Raton, Florida, USA
3. Tripathi, D.P. (2005) Mushroom Cultivation, Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi.

4. Pathak, V. N. and Yadav, N. (1998). Mushroom Production and Processing Technology. Agrobios, Jodhpur.

V. Reference Books:

1. Tewari Pankaj Kapoor, S. C. (1988). Mushroom Cultivation. Mittal Publication, New Delhi.
2. Pandey R.K, S. K Ghosh, (1996). A Hand Book on Mushroom Cultivation. Emkey Publications
3. Nita Bhal. (2000). Handbook on Mushrooms (Vol. I and II). Oxford and IBH Publishing Co.

   Pvt. Ltd., New Delhi
4. Pathak V.N., Nagendra Yadav and Maneesha Gaur (2000), Mushroom Production and Processing Technology Vedams Ebooks Pvt. Ltd., New Delhi
5. Rattan, S.S. and R.C. Upadhyay (2006) Mushroom Production Technology: Recent Advances, Daya Publishing House, Delhi, India

VI. Suggested activities and evaluation methods:

Unit-1: Activity: Collection of data on various types of mushrooms and making a report.

Evaluation method: Judging the written report, providing feedback on the overall quality, strengths, and areas for improvement.

Unit-2: Activity: Group discussion of mushroom cultivation units and layout.

Evaluation method: Members of the group provide evaluations of their peers' contributions and participation.

Unit-3: Activity: Internship on spawning and casing in mushroom culture.

Evaluation method: A viva-voce at the end of internship based on specific performance metrics and knowledge gained.

Unit-4: Activity: Case study on production techniques for different edible mushrooms.

Evaluation method: Clarity, coherence, and logical structure of the case study report based on identification of key issues, analysis, and synthesis of information.

Unit-5: Activity: A survey report on market demand and consumer preferences for mushrooms and their value-added products.

Evaluation method: Assessing the quality of data analysis, including the use of appropriate statistical techniques, interpretation of results, and meaningful conclusions.

V Semester

Course 15 A: Mushroom Culture Technology

Credits -1

I. Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Identify and discriminate different mushrooms based on morphology.
2. Understand facilities required for mushroom cultivation.
3. Demonstrate skills on preparation of spawn, compost and casing material.
4. Exhibit skills on various cultivation practices for an edible mushroom.

II. Laboratory/field exercises:

1. Identification of different types of mushrooms.
2. Preparation of pure culture of an edible mushroom.
3. Preparation of mother spawn.
4. Production of planting spawn and storage.
5. Preparation of compost and casing mixture.
6. Demonstration of spawning and casing.
7. Hands on experience on cropping and harvesting.
8. Demonstration of storage methods.
9. Preparation of value-added products.