

# Mushroom production Zimbabwe

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Nations**

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# BASIC BIOLOGY OF MUSHROOM

- Members of the Fungi kingdom
- No chlorophyll thus unable to manufacture own food using Carbon dioxide and Sunlight
- Totally dependent on organic materials for food, growth and energy which is provided by specially prepared substrate
- Highly sensitive to T<sup>0</sup>C and Humidity
- It is grown from spores (spawn)
- Under proper conditions, spores germinate into hyphae (mycelia)

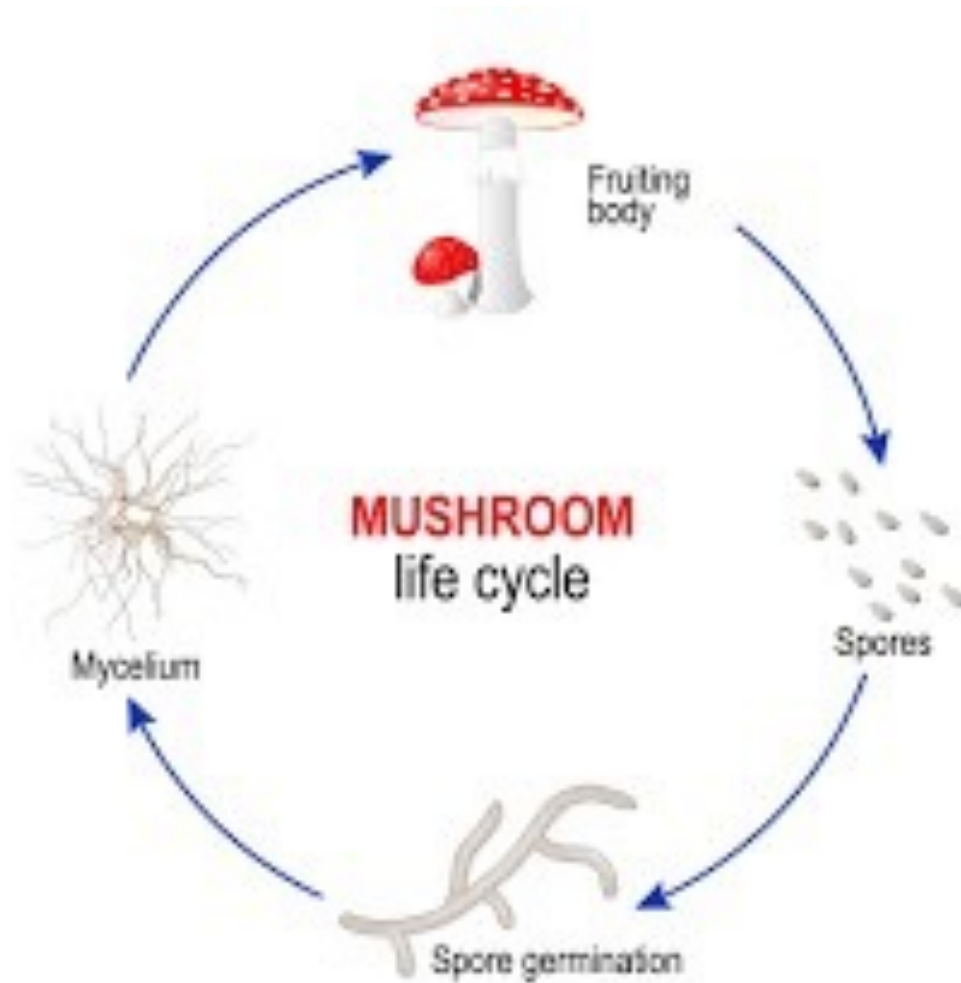
# BASIC BIOLOGY OF MUSHROOM

- Germinated hyphae form primary mycelia, and then secondary mycelia through hyphal fusion/mating.
- They accumulate nutrients from the substrate (media for growth) and colonize the substrate.
- When stimulated by mainly temperature, humidity and light, the mycelial colony forms pins
- Pins segregate into a cap and fruiting bodies
- Under the cap, spores are produced in the gills
- Fruit bodies release these spores in order to produce the next generation.

# BASIC BIOLOGY OF MUSHROOM

- The life cycle of mushroom is divided into two phases: **vegetative** and **reproductive** growth.
- Vegetative growth indicates linear growth of fungal mycelia dissolving complex substrate components into simpler molecules and absorbing them as nutrients.
- When certain conditions are obtained ( temperature, humidity, oxygen and light), the mycelia cease vegetative growth and begin to produce fruiting bodies, which we call 'mushroom'.
- This is reproductive growth.

# MUSHROOM LIFE CYCLE



# IMPORTANCE/USES OF MUSHROOM

- Mushroom is widely used as a vegetable
- It is rich in protein
- It is an excellent source of vitamins especially C and B
- Mushrooms are also used for medicinal purposes
- They produce compounds restricting tumour activity which is widely used as a leading cancer drug in pharmaceutical industries.
- Uses agricultural waste products as growing media
- Produces enzymes that converts agro based waste such as cotton waste into biological products to ensure a healthy and safe environment
- After picking, the spent substrate is a good soil conditioner
- Mushrooms have a high production per surface area.
- Generates income on a small space and within a short time

# TYPES OF MUSHROOM IN ZIMBABWE

## ☐ Indigenous varieties

- *Amanita zambiana* - Nhedzi
- *Termitomyces* species - Huvhe
- *Cantharellus densifolius* – Zheve
- *Cantharellus longisporus* – Pfirifiti
- *Cantharellus cibarius* - Chihumbiro
- *Boletus edulis* - Dindindi



# INDIGENOUS VARIETIES





# INDIGENOUS MUSHROOMS

- Zimbabwe has a variety of indigenous mushrooms that grow wild in the forests
- Their production is confined to the rainfall season as it provides conducive conditions for the germination of spores
- Normally the mushrooms become abundant in humid conditions
- Most of the mushroom is sold/consumed as fresh
- Some people dry the mushrooms when they are abundant for later use.
- However, there has been an increase in mushroom poisoning cases in the past years
- Most people are now skeptical on consuming wild mushrooms

# TYPES OF MUSHROOM IN ZIMBABABWE

## □ Cultivated varieties

### ○ *Pleurotus spp* – Oyster

- Oyster is the most common cultivated variety due to its simplicity and low cost cultivation technology
- It has the ability to degrade residues (primary decomposers) from agricultural wastes and convert them into protein rich biomass
- It has a good adaptability to a wide range of temperature making it possible for all year round production with limited controlled climatic conditions
- It is a mushroom of choice for beginners because they can be raised in many substrates, on small scale with moderate investment.
- Can be sold fresh or dry



# TYPES OF MUSHROOM IN ZIMBABWE

○ *Agaricus bisporus* - White button

- *Agaricus* is a secondary decomposer, which means that bacteria and other fungi have to break down raw materials before *Agaricus* can grow.
- This is the process known as composting.
- The production of substrate requires expertise for composting
- White button mushroom requires more controlled temperatures as such an air-conditioner is required for production
- It is more capital intensive
- Generally has higher returns than oyster
- Usually sold fresh



# SUBSTRATE

- Substrate is the agricultural waste on which the mushroom grows.
- A good substrate has the following properties;
  - Easy availability
  - High nutrient content for the mushrooms to grow
  - Good aeration – not too compact and not too loose
  - Good water holding capacity – not too dry and not too wet
  - Free from molds
  - The productivity and protein content of mushrooms is highly dependent on the C:N of the substrate

# SUBSTRATE

- Oyster mushroom can be grown on several agricultural wastes;
  - Finely chopped rice or wheat straw
  - Shredded maize cobs
  - Cotton waste
  - Finely chopped maize stalks
  - Sawdust from broad leaved trees
  - Banana leaves
- Button mushroom
  - Chicken Manure
  - Horse Manure

# SUBSTRATE



# MUSHROOM PRODUCERS IN ZIMBABWE

- Mushroom is mainly produced on a small scale basis
- It is mostly done by urban and peri-urban farmers
- These farmers are close to the markets
- Mushroom is highly perishable and requires a cold chain maintenance after harvest to improve its shelf life
- There are some rural farmers into mushroom production especially women groups



# Profitability of mushroom production

- Mushrooms are an ideal crop for small scale farmers and produce a very high return per square meter.
- Mushrooms can produce up to 150kg per square metre of growing area every year.
- At current prices of \$5 - \$10 kg, that's up to \$3 000 worth of harvest from a 3 x 3 space in a year!
- Knowledge of mushrooms is important in order for you to run a profitable farm.
- Also, the marketing of your produce is essential in order to find buyers.
- The demand for healthier food options will continue to increase and drive the demand for mushroom.



# CHALLENGES

- Availability of substrate
- Availability of spawn. Most spawn producers are in Harare.
- Low productivity (Biological efficiency less than 100%)
- Lack of technical know how with most farmers

# Opportunities in mushroom production

- Ready market
- Currently our local production is not satisfying the local markets
- Availability of cheap material such as grass for construction of mushroom houses
- Conducive climatic conditions for production esp oyster mushroom
- Mushroom production can be done irrespective of age, gender and skill
- Provide quick returns and a potential income generator for low income households

# Small scale oyster mushroom production in Zimbabwe



# White button production in Zimbabwe





The End!!

