Low Cost Mushroom Cultivation for Namibia
Diversified Agriculture Scheme
Diversified Agriculture

Primary Crop

Mushroom House

Fish Cages

Diversified Agriculture
Mushrooms Earn a LOT of Money for Farmers
But are CHEAP to Grow!
Steps Involved in Mushroom Cultivation

1) Choose Species
   for your Climate and Substrate

2) Generate Spawn

3) Prepare Substrate - Sterilize or Pasteurize

4) Inoculate Substrate

5) Harvest and Market
Choosing Correct Strains
More than 100 different mushrooms in cultivation

1. Must grow in your Climate

2. Must grow on available substrate

Must resist local contamination
Choosing Strains

Choose Acclimatized Strains when Possible

Choose Strains for your Substrate

• Purchase
• Tissue Culture
• Spore Print
Strain Capture by Tissue Culture

- Choose Local Strains growing on your available substrate

- Sterile Transfer Tissue Segments onto Agar

  Agar Substitutes:
  
  Banana – Potato – Maize - Cassava

- Isolate Pure Culture
Banana Makes Good Agar Substitute
Another Agar Substitute
Spore Printing Wild Collected Specimens

or

Purchased Mushrooms
Substitute Bottles and Jars for Low Cost Labware
Glass Jar with Polyethylene – Rubber Band Closure
Whiskey Bottles and Cotton for Grain Spawn
Log Culture with Hardwood Plugs

No Sterilization

Multi-Year Crop

Very Easy
Substrate - Sawdust and Timber Waste
Substrate – Sugar Cane Fiber
Coffee Waste
Paper and Cardboard Waste
Straw
In Short, nearly any agricultural byproduct can be used as a growing substrate.
To Grow Mushrooms - Substrate needs to be Sterilized or Pasteurized.

- Radical pH Change: Lime or Ashes
- Oxidizer: Bleach or Hydrogen Peroxide
- Temperature: Pressure or Atmospheric Steam
- Reduce Simple Sugars: Composting or Fermentation
- Radical Change in Osmotic Pressure: Soap
Sterilizing

Simple Steam Chamber
Sterilizing

Another Simple Steam Chamber
Other Ways to Pasteurize / Sterilize Substrate

- **Bleach**
- **Hydrated Lime**
Washing Powder
Comparison of Different Substrate Treatment Methods

- Steam
- Lime
- Bleach
- Soap
Other Ways to Pasteurize / Sterilize Substrate

Wood Ashes
200 Liter drums – filled with ~150 liters water

Drums were brought to pH 11 using
1.25 kg Hydrated Lime
4.24 kg Sifted Wood Ash

After mixing - 35 kilos straw added to ea drum

Straw Soaked in Drums for ~16 hours – 73% Moisture

Straw put into 1.8 kgs Plastic Bags

Each Bag Inoculated with 120 g Oyster Mushroom Spawn
AVG YEILD FOR DIFFERENT METHODS

3 flushes – 1.8 kg bags (490 grams dry weight)
Water and Sterilant
Lime, Ashes, Soap, etc.

Hydrates and Pasteurizes All in One Step

straw

pump

Water and Sterilant
Lime, Ashes, Soap, etc.
This method has Several Important Advantages:

1) It requires very little water. Only the water which is bound to the substrate has to be added.

2) No waste water is produced during the operation.

3) Energy is needed only for the pumping of water. This can even be produced by a photovoltaic device.

4) Additives can be easily and economically added to the cycling water.
Paddy Straw Mushrooms

Simple to grow, fast, high volume production
Paddy Straw: growing pile
Paddy Straw: Fruiting
Growing Requires Good Temperature and Humidity Control
Grow House: Local Material
Inside Grow House
Inside the Grow House:  
The Beds
Inside the Grow House: The Beds – After Harvest
The Result of good mushroom cultivation
The Result:
The Result:
The Result

Increased Income for the Farmer
Resources

Books
Aloha Medicinals Scholarships

30 days in Carson City, Nevada
Thank You for your Kind Attention