Cultivating Mushrooms on Logs

presented by

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November 2006

Presentation Plan

- Agroforestry
- History of culture on logs
- Cultivation methods
- Mushrooms species for culture
- Economic potential of this production

Agroforestry

Agroforestry includes all land use systems where woody plants are deliberately associated to cultures or rearing of livestock, in a spatial arrangement or in a sequence in time taking place on the same piece of managed land. Agroforestry systems are characterized by significant ecological and economic interactions between their various components.

History of this type of production

- This production started in Asia about 2000 years ago.
- Its popularity grew in Quebec during the 1970s under the direction of Gyorgy M. OLA'H, professor at Université Laval.
- Until now, it has been confined solely to mycological groups in Eastern Canada.

History of this production

Principal reasons for this being:

- A limited vision for the use of the forest.
- Lack of knowledge of cultivation methods and potential markets.

Cultivation Methods

- Tree species selection
- Felling trees
- Incubation site selection
- Log inoculation
- Culture maintenance
- Production

Tree Species Selection

- The selection depends on the economic value of the species on your farm.

- Species selected on our farm are:
  - Poplar
  - Birch
  - Pin cherry
  - Maple

Felling Trees

We select trees that are healthy. Felling is preferably done at the end of the winter because during this period:

- Wood has a higher sugar content
- Bark adheres better to the wood

Ideally, trees are felled in 1 m long logs with a diametre of 10 to 25 cm.

Incubating Site Selection

The factors for selection of incubation sites are:

- climate: heat and humidity
- forest cover: hardwood vs. softwood species
- vegetation in the area: presence or absence of shrubs
- slope: south-facing slopes to maximise sun exposure on logs

Incubating Site Selection

All of these factors come together to make up the site's micro-environment.

The ideal site should be warm, shaded, easily accessible, well ventilated and near a water source.

Inoculation of the logs

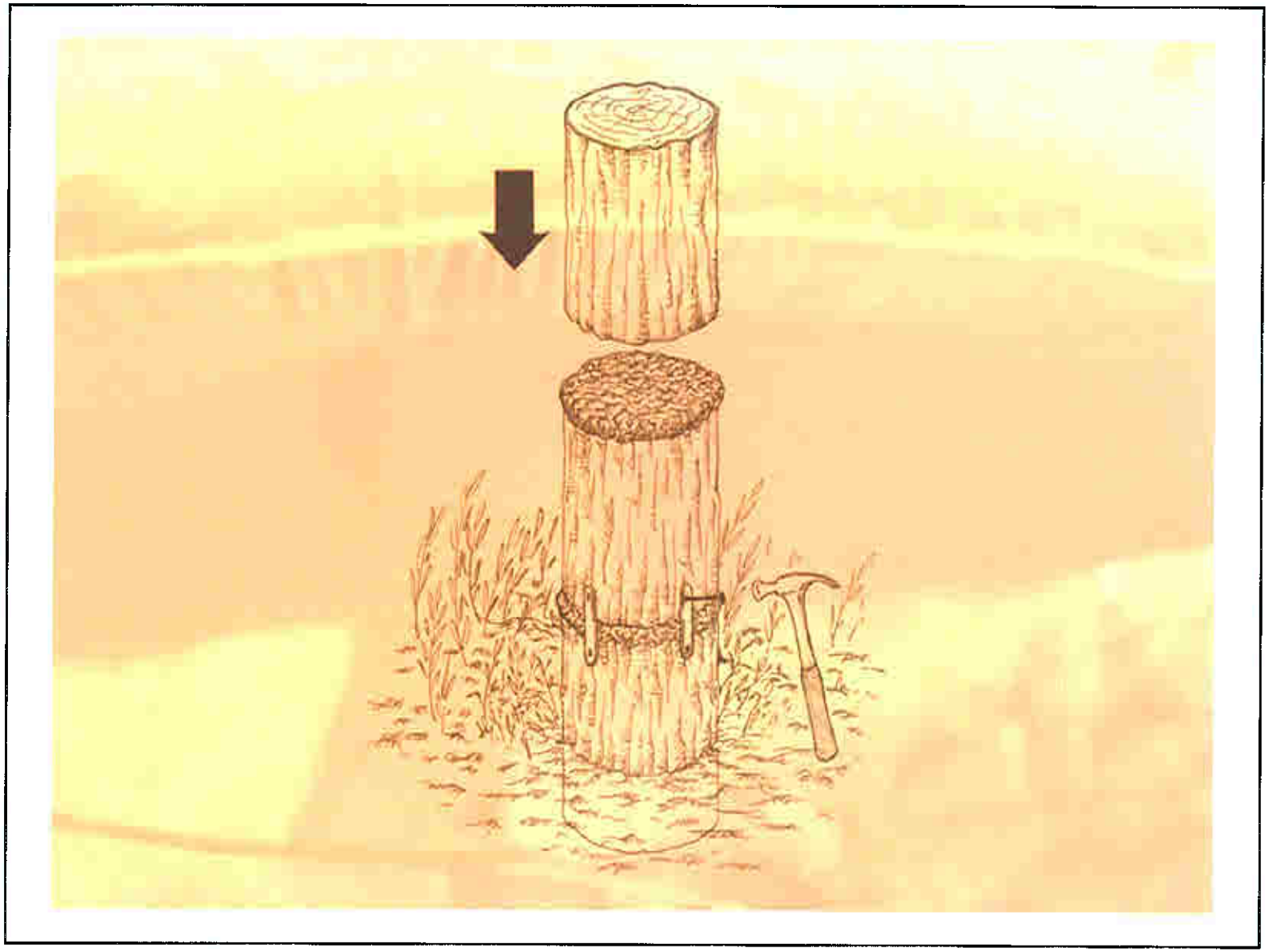
Inoculation techniques can be broken down into two general categories :

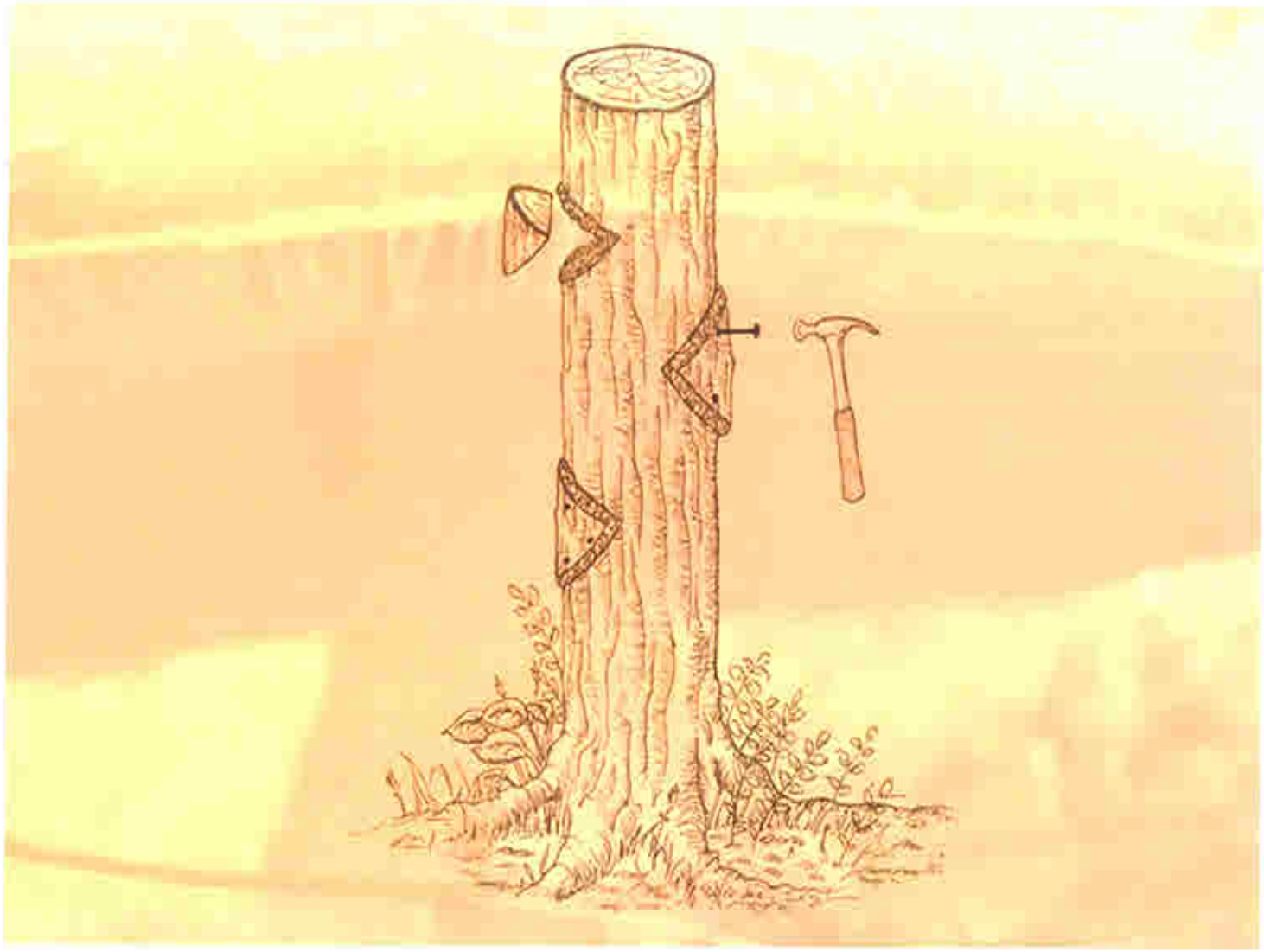
- using bulk amounts of mushroom mildew
- inserting plugs

Using bulk amounts of mushroom mildew

Mushroom mildew that has been developed on grain or straw is deposited inside split logs or in large slits in the logs.

This is a long procedure and requires a large amount of mildew.





Inserting plugs

- Pre-innoculated plugs are inserted into holes drilled in logs.
- You can also use mildew developed on grain or on sawdust.
- Holes are then sealed with paraffin wax.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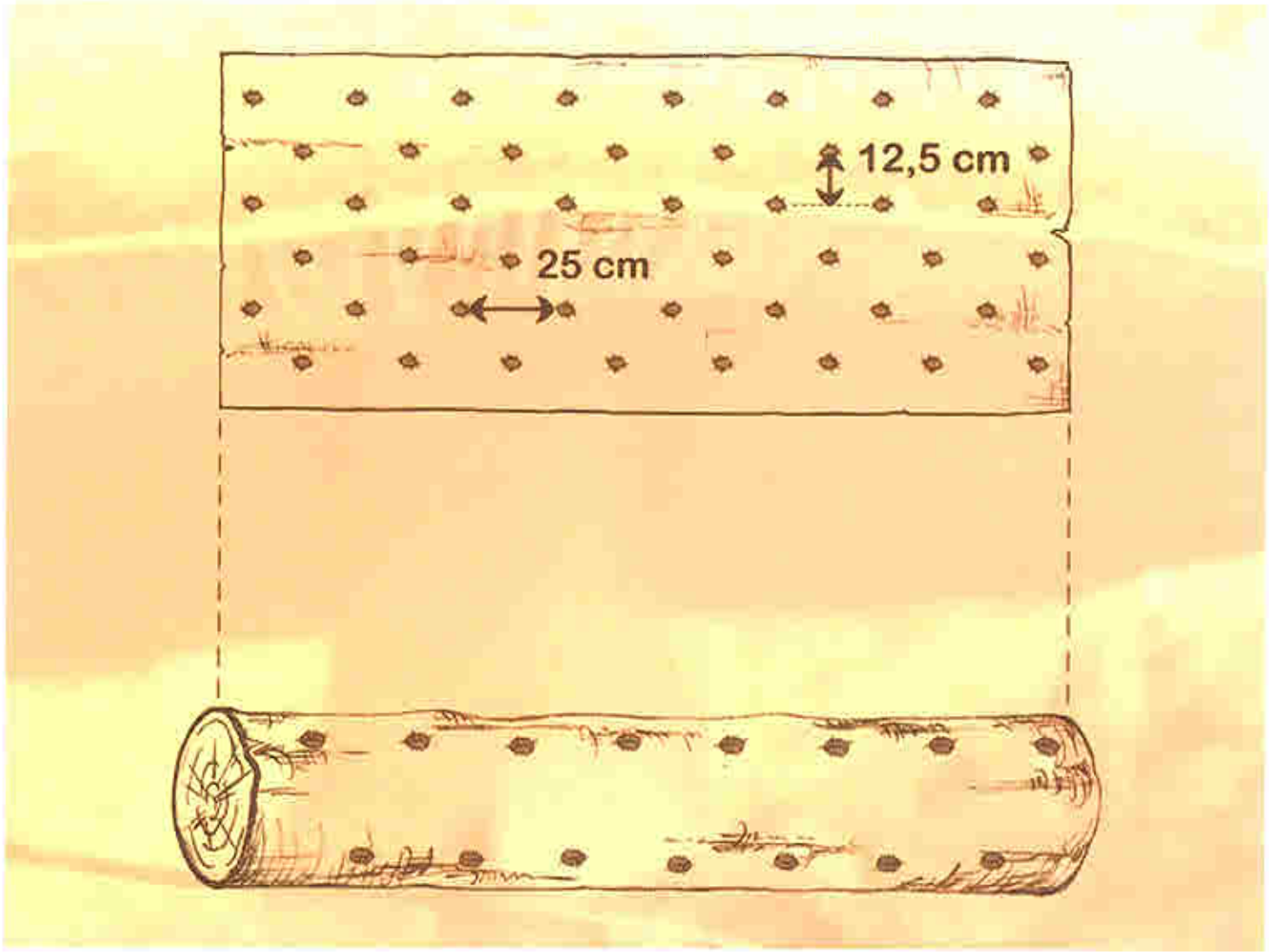
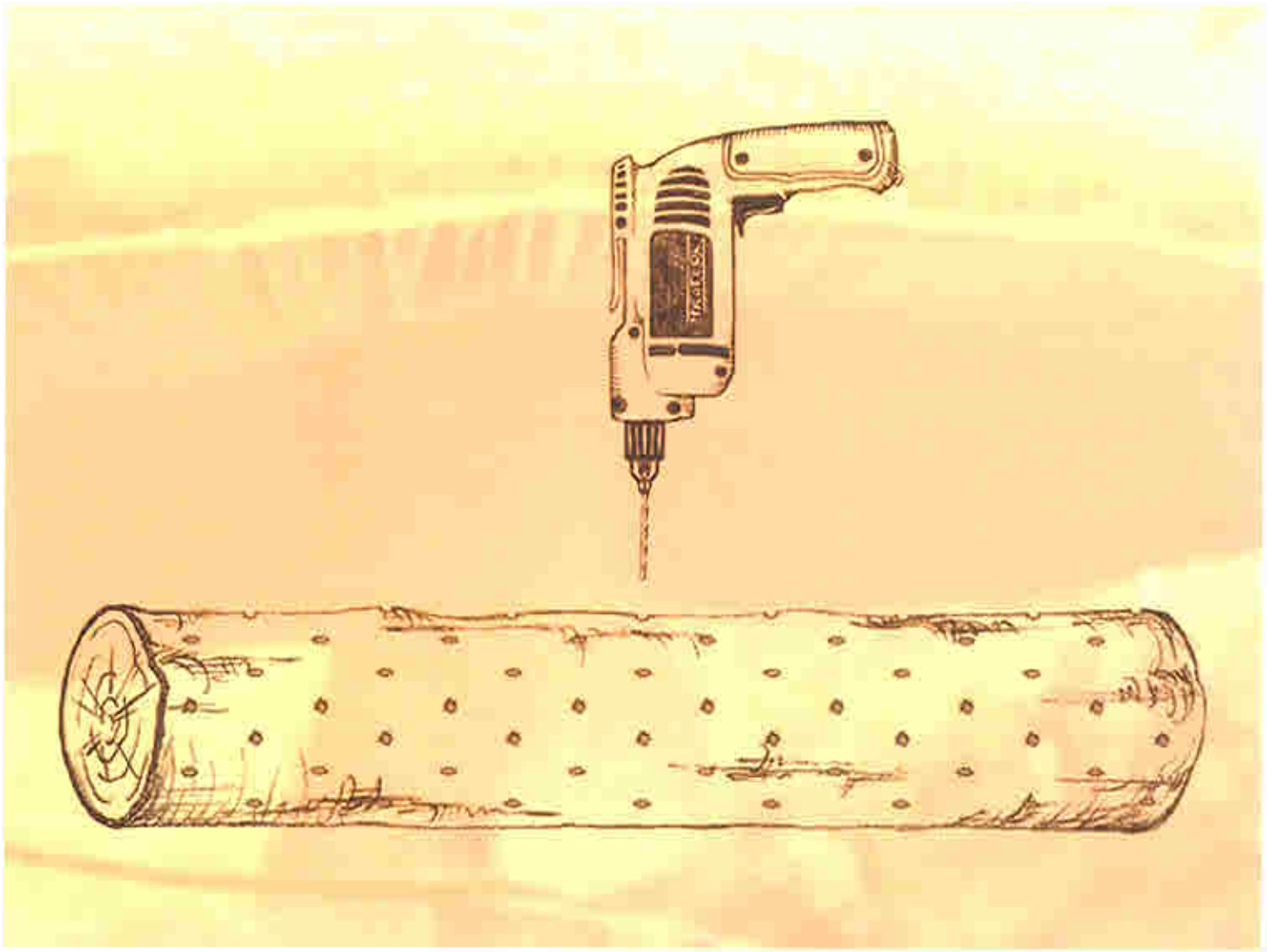
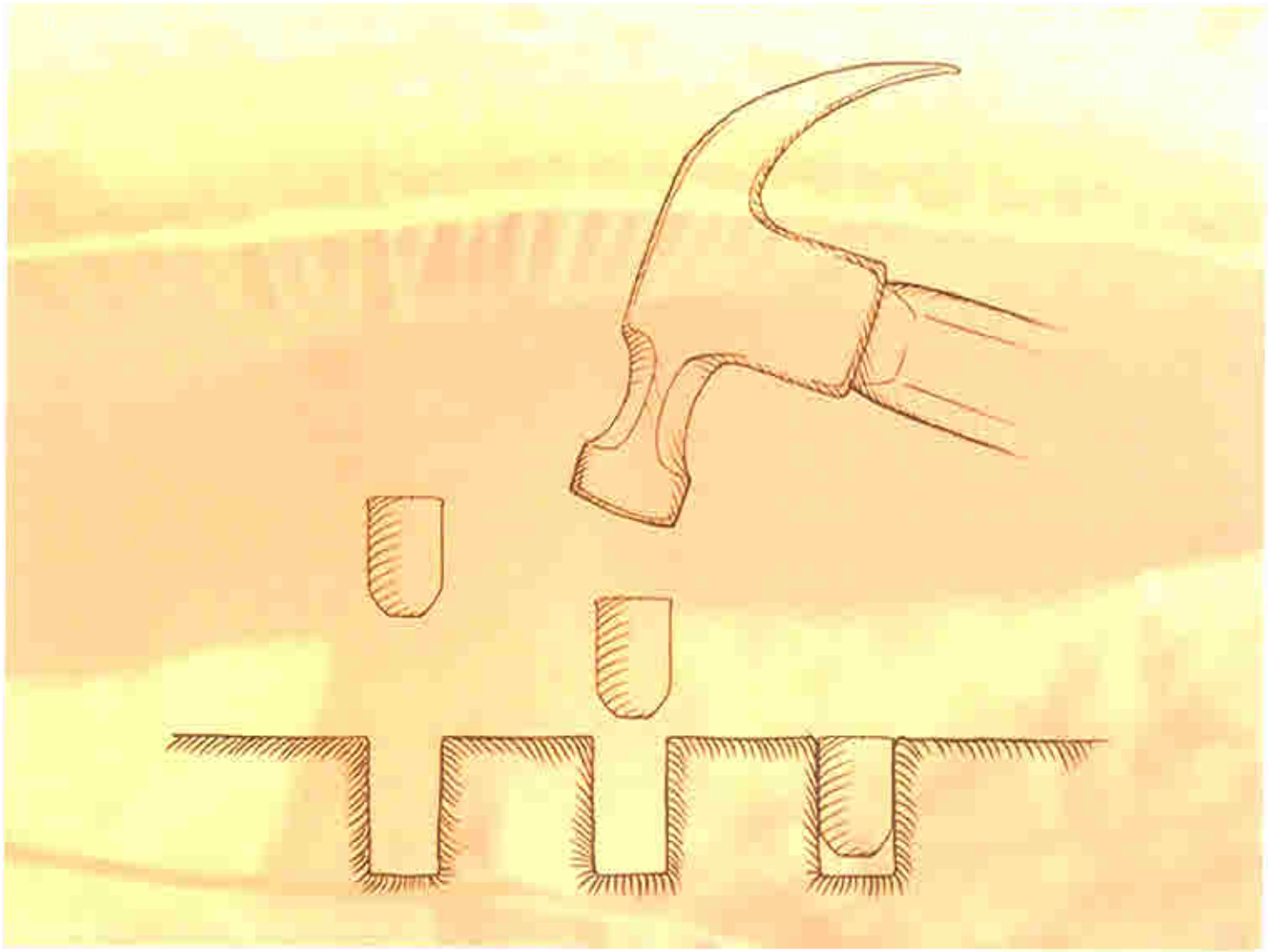

12,5 cm
25 cm





Culture Maintenance

Minimalist management consists of:

- Checking the humidity level of logs and water if needed;
- Checking for the presence of insects that could be feeding on the mushroom mildew (such as slugs) and apply appropriate measures of control.

Production

Production is calculated this way:

Weight of dry logs

Biological efficiency coefficient
(usually 30%)

Weight of mushrooms that we can expect to produce on the logs

Species of mushrooms that can be produced

- Oyster mushrooms (*Pleurotus ostreatus*)
- Shiitake (*Lentinus edodes*)
- Reishi (*Ganoderma lucidum*)
- Judas's ear (*Auricularia-judae*)
- Lion's mane (*Hericium erinaceum*)

Oyster mushrooms

- Pleurotus ostreatus -

- The oyster mushroom grows naturally in eastern Canada; its production is not particularly difficult.
- Inoculation of the logs during the spring leads to the production of mushrooms by the fall.
- Easy to market.

Shiitake

- Lentinus edodes -

- Most cultivated mushroom in the world.
- Excellent production potential on birch logs.
- Some cultivars are winter hardy.
- Outdoor incubation lasts for approximately 2 years.
- Spring and fall production.
- Marketing is becoming easier.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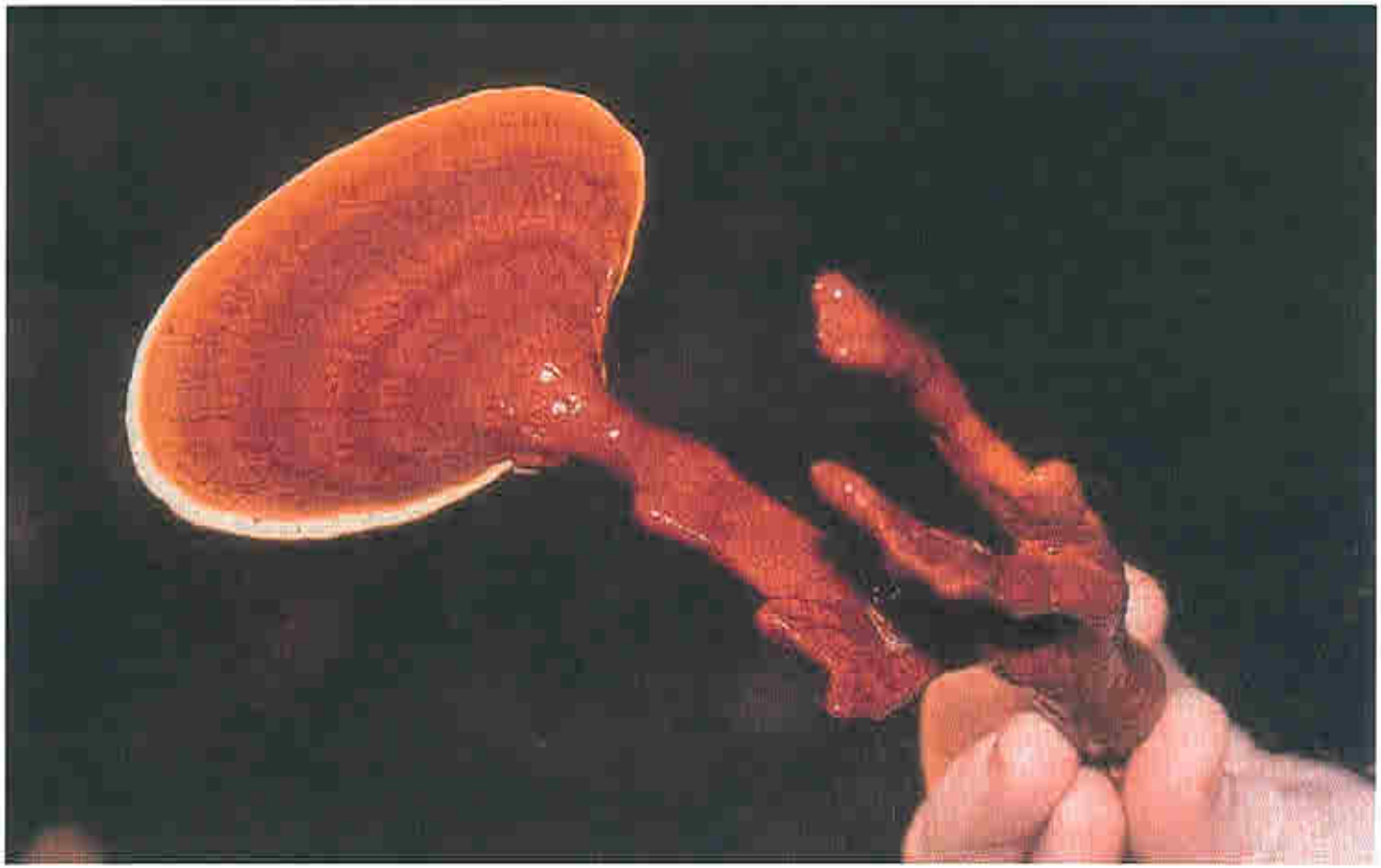
Reishi

- Ganoderma lucidum -

- Medicinal mushroom used in traditional chinese medicine.
- Lengthy outdoor incubation (3 years).
- Fruiting stage in the spring.
- Marketing towards users of alternative medicines.



Judas's ear

- Auricularia judae -

- Gastronomic mushroom consumed primarily by the asian community.
- Lengthy outdoor incubation (minimum 2 years).
- Similar cultivation method to shiitake.
- Sold almost exclusively in a dehydrated form.

Lion's mane

- Hericium erinaceum -

- Can be grown on ash or beech logs.
- A third of the portion of the logs is covered with soil.
- Lengthy outdoor incubation (minimum 2 years).
- Spring and fall production.
- Difficult to market.

Production

Mushroom production will spread over 2 to 3 years for wood species like aspen and over 5 to 6 years for species like maple and oak.

Economic Potential

- The price of a cord of aspen is $115.
- This cord of wood weighs approximately 3600 kg.
- Humidity is approximately 45%, so the dry weight is 1980 kg.
- The biological efficiency coefficient is 30%, so you can expect to produce 590 kg of mushrooms.

Economic Potential

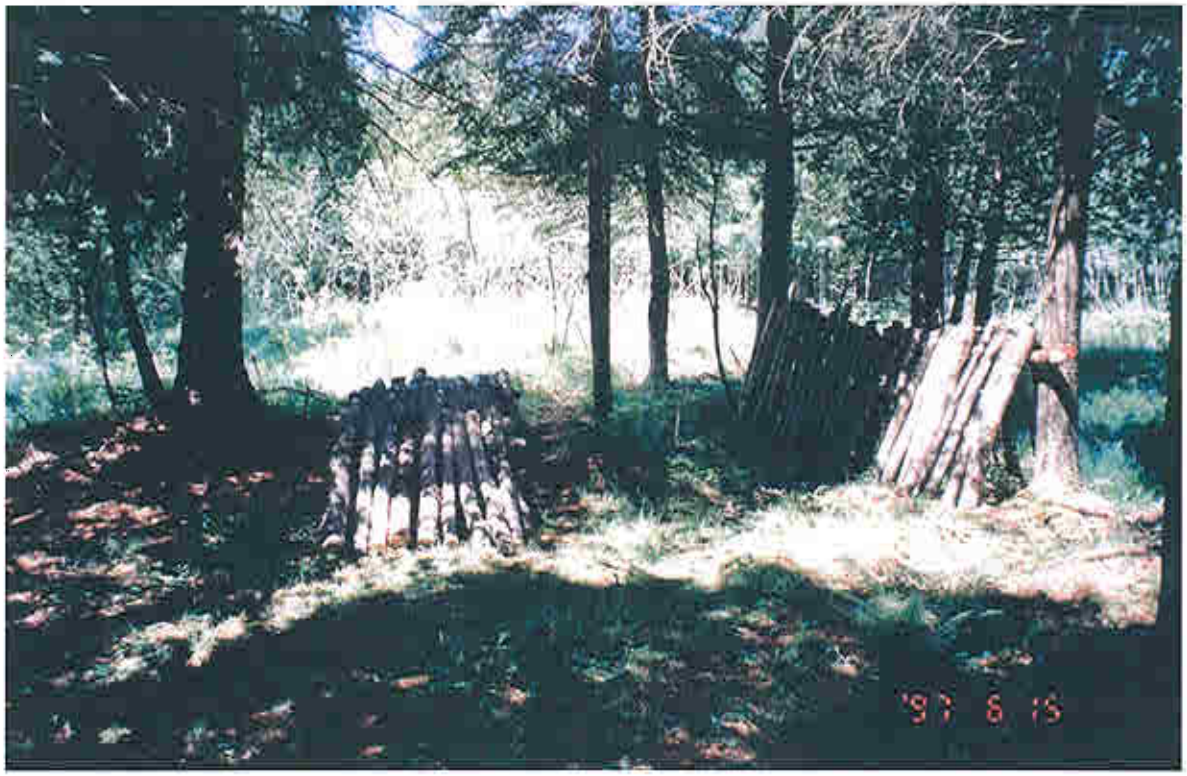
- Sales of fresh mushrooms at $8.50/kg = gross revenue of $5015.
- Sales of dried mushrooms at $2/20 g = gross revenue of $5900 (90% of the weight is removed during dehydration).
- Inoculation costs with the use of plugs is approximately $1000.
- Net revenue of approximately $4000 for a cord of aspen used in the production of mushrooms, versus $115 for its sale to a sawmill.

Conclusion

This type of production is a natural fit for agroforestry farm operations.

You can optimize the value of woody species that normally have a low economic value.

However, you have to consider that as a producer, you will have to learn new production techniques and consider the work involved in marketing your products.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