Preliminary Planning and Design for Edible Fungus Production

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Abstract: With the development of the edible fungi industry, the edible fungi factory is the inevitable developmental trend. Already, there have been several modernized edible fungi factories set up in China. Annual production of edible fungi has become a reality. This text focuses on the rare variety *Coprinus comatus* as the production target. According to the mushroom's cultivation technology characteristics and technological flow, the overall design of a factory for producing *C. comatus* is described, with special emphasis on the inoculation room. Finally, a preliminary technical economic analysis of this factory has been undertaken.

Key words: Edible fungi factory, production, *Coprinus comatus*, design

1 Introduction

In recent years, China's edible fungi industry has developed very quickly. Output ranged from 4,000,000 tons in 1997 to 6,630,000 tons in 2000. At present, the scale of production of edible fungi is small and loose, the level of industrialization and standardization is very low, and the planting methods behind those adopted elsewhere. Therefore, factories for producing edible fungi are the inevitable developmental trend.[1] These factories can realize annual production of edible fungi. This text describes the preliminary design of a factory for producing *C. comatus*, and offers some insight into China's edible fungi factories.

2 Technological Flow for *Coprinus comatus* Cultivation.[2]

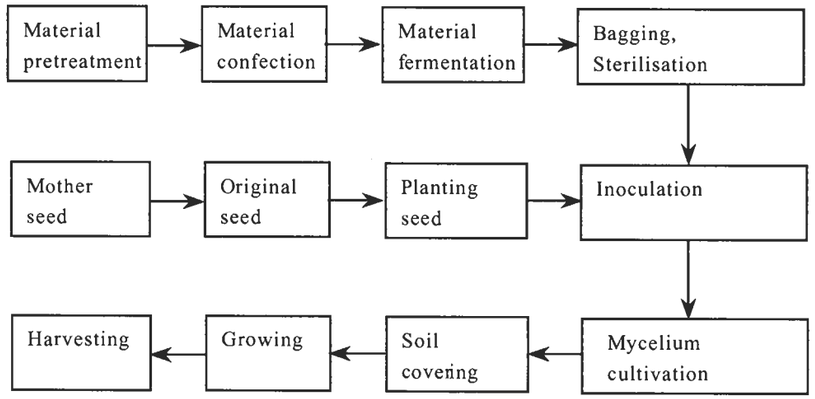

Figure 1.Technologic flow for *C. comatus* cultivation

3 Factory Design

A blueprint for the edible fungi factory is shown in Figure 2.

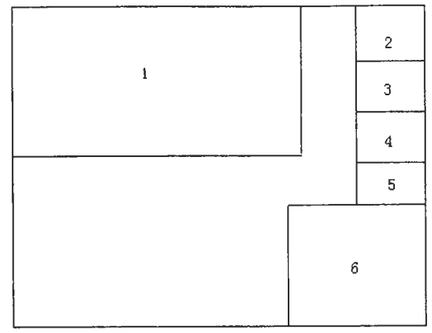

Figure 2. Structural design of the factory

1, Cultivation room (10.8m × 5m); 2, cultivation room for mother seed (2.5m × 2m); 3, room for cultivating seed (2.5m × 2m); 4, inoculating room (2.5m × 2m); 5, cushioning room (2.5m × 2m); 6, cooling room (5m × 5m).

The structural plan of the Cultivation Room is shown in Figure 3.

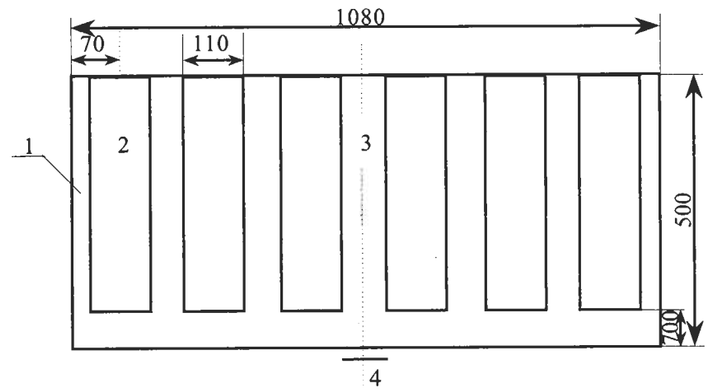

Figure 3. Structural plan of the cultivation room

1, side space; 2, planting racks; 3, walkway; 4, entrance door. Measurements are expressed in cm.

The size and arrangement of the Cultivation Racks are shown in Figure 4.

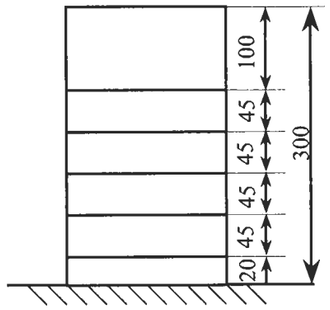

Figure 4. Structure of cultivation rack
Measurements are expressed in cm.

4 Technical and Economic Analysis

Production method: bag, casing soil; production cycle: 60 days.
Production investment / (year × m^2):
Producing investment consists of the cost of material (10.5RMB / (year × m^2)), the cost of making bags (2.3RMB / (year × m^2)), the cost of the management (8.7RMB / (year × m^2)), the depreciation cost of equipment (40RMB / (year × m^2)), the depreciation cost of workshop (40RMB / (year × m^2)) etc.

Producing investment / (year × m^2) = the cost of material / (year × m^2) + the cost of making bags / (year × m^2) + the cost of the management / (year × m^2) + the depreciation cost of equipment / (year × m^2) + the depreciation cost of workshop / (year × m^2)
=10.5 + 2.3 + 8.7 + 40 + 66.7
=128.2RMB / (year × m^2)

B. Production value / (stubble × m^2)
Average unit price: 7RMB / kg
Turnout / (stubble × m^2): 18kg /(stubble × m^2)
Production value / (stubble × m^2) = Average unit price × Turnout / (stubble × m^2) =7 × 18
=126RMB / (stubble × m^2)

C. Income / year:
Stubble number: 5 stubbles / year
Planting area: 141.9m^2
Income / year = ((Production value / (stubble × m^2) × stubbles / year)-Producing Investment / (year × m^2)) × planting area
= (126 × 5-128.2) × 141.9 = 71205.42RMB / year.

5 Conclusion

The edible fungi factory is the link between engineering and biology. The quality and quantity of edible fungi have been greatly improved. Year-round production of edible fungi has become a reality. If liquid inocula are used in production, productivity will also be improved. The edible fungi factory is the inevitable developmental trend, and it will be useful for bringing our nation's edible fungi to international markets.

References

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