

Small Scale Mushroom Production

Agaricus bisporus

VEGETABLE CROPS PRODUCTION GUIDE

FOR THE ATLANTIC PROVINCES

Prepared by the ADVISORY COMMITTEE ON VEGETABLE CROPS

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Introduction

Successful mushroom growing involves overcoming difficulties such as temperature and humidity control, pest control and compost preparation. The amateur mushroom grower should recognize that most basements do not provide ideal conditions for good growth.

Mushroom production is a difficult task at the best of times. This publication is intended to provide useful tips in order to increase the rate of success of growing mushrooms.

Location

For the amateur, mushrooms are usually planted in the fall and the best location is the cellar, basement or a barn or any tight, light-proof, well ventilated and insulated building. The following conditions should be met:

1. Air temperatures controlled between 13°C and 21°C.
2. Relative humidities between 80-95 %.

A corner of the basement can be partitioned off by the use of a polyethylene divider. This will help to maintain proper humidity levels. A plastic hood placed over the growing bed is a second alternative. Do not place beds where direct sunlight will fall on them. Ventilation is useful to remove offensive odors. Where temperatures cannot be maintained, supplementary heat is necessary.

Mushroom beds are usually 120-150 cm wide, 15-20 cm deep and as long as you wish. Boards that form the bottom should not be over 15-20 cm wide, leaving 2 cm to 4 cm cracks between

them for ventilation. Several tiers can be made approximately 60 cm apart. Production in plastic bag beds is also used commercially especially in Europe.

Compost Preparation

The growing medium for mushrooms is a compost which traditionally has been made from horse manure, hay, poultry manure, brewer's grain, gypsum and commercial fertilizers, including ammonium nitrate.

A suggested formula for trial use is as follows:

horse manure (85%)	.75m ³
hay (10%)	.5-1 bale
poultry manure (5%)	18 L
gypsum	4.5 kg
ammonium nitrate	.45 kg

This formula will supply sufficient compost to fill a growing bed with the following dimensions: 300 cm long, 120 cm wide and 15 cm deep, or .57m³. A growing bed 20 cm deep is more satisfactory.

To prepare the compost, start with a layer of manure on the bottom and alternate with a layer of hay, poultry manure and fertilizer materials. If possible, the horse manure should be piled under cover and the pile should be square and the top level. Wet the pile thoroughly during layering and throughout the 12-14 day composting period. Turn the pile on the third day, mixing the ingredients thoroughly, add water to run-off and repeat the turning process on the 6th, 9th and 12th days.

If there is enough moisture, oxygen and nitrogen, the temperatures within the pile should rise to 60°C-66°C. At the end of the composting period, the compost should be dark brown, pliable and lumps should break apart easily. The compost is now ready for the beds. Hobby mushrooms growers report some success using straight, fresh horse manure obtained from horse stables with no other additives. The horse manure is then composted for 10-14 days, steam pasteurized for 30 minutes at an estimated 71°C, allowed to aerate sufficiently to remove all traces of ammonia odor and placed into beds. Steam pasteurization is required for the control of insects and diseases that are present in the compost.

Production Steps - Spawning

Allow the compost to remain in the beds until the temperature of the compost drops to 21-27°C before applying the spawn. Ammonia odor in the beds will usually kill the spawn. The compost bed should be mounded up firm, but not packed. Spawn should be broadcast over the surface of

the bed and mixed thoroughly into the compost. Apply the spawn at the rate recommended by the supplier. Spawn is available in small packages from seed companies and garden supply centers. Maintain the bed temperature at 21°C-25°C for 1 week then lower the temperature to 15°C-18°C for the remainder of the production period. Spawn will be killed at 35°C. Examine the spawn run in the bed after 2 to 3 week. Casing should be applied when the white cottony growth of the fungus has reached the top of the bed. Remember to keep the compost moist at all times. It is good to cover the bed surface with newspaper or plastic. Keep the newspaper wet. Very little fresh air is required during the spawn run.

Pest control

The two most common pests that are likely to occur are:

1. Fungus gnat (fly) larvae, and
2. Fungal diseases

Fungus gnat larvae may be controlled by hanging insecticide strips. Several insecticides may be used as thermal fogs. For details consult your provincial mushroom specialist. Fungicides may be used for disease control. Apply only if disease problems have been encountered and only after casing. If necessary, a second application can be made up to the first pinning. Consult label recommendations for days to harvest. Use a small pressurized sprayer or a watering can with a fine nozzle. (Yellow sticky traps can be used to monitor fly levels.)

Casing

A convenient casing material contains equal parts by weight of sphagnum peat moss and calcitic limestone. Prewetting of the casing material is advisable. Commercially prepared casing material to which lime must be added is available from Annapolis Valley Peat, Berwick N.S. The moist casing layer is placed over the surface of the compost bed to a depth of 2-4 cm.

Cropping

First mushrooms should appear 3-4 weeks after casing. Regular watering to keep the casing soil moist will encourage mushroom growth and help to keep the humidity high.

Sprinkle frequently with warm water but do not overwater. Good ventilation is important when the pins, (small mushrooms) begin to develop. A mushroom is ready to be picked when the diameter of the cap is equal to the length of the stem and preferably before the veil under the cap stretches and opens. Mushrooms are twisted out rather than pulled. Good commercial yields often reach 1.4 kg per m².

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