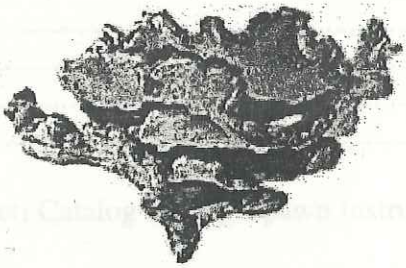
Mushrooms for the Campus Center for Appropriate Technology



A Sustainable Campus Endeavor Presented by:

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Problem statement

As part of their sustainable living goals, Humboldt State Universities Campus Center for Appropriate Technology (CCAT) needs to become more self-reliant by using their land efficiently to produce food. Much of the cleared land around receives minimal sunlight, leaving very few options for crop cultivation.

Background

CCAT is a demonstration home known worldwide for its dedication to sustainable living techniques and the appropriateness of its technology. Currently unused land can be used to enhance CCAT's sustainable living goals.

After researching, we decided mushrooms would be the ideal crop to set up on the vacant space. Mushrooms such as Shiitake, Chicken of the Woods, Lion's Mane, and Oyster mushrooms thrive in a moist climate, with full or partial forest canopy. In order to cultivate these types of mushrooms, it is essential that the climate be appropriate, with small amounts of sunlight to avoid the evaporation of water during mushroom cultivation that can diminish the quantity and quality of the mushroom crop. After discovering that mushroom cultivation was a perfect fit for the area of land that had been cleared on CCAT's property, we felt it necessary to research the health benefits of various types of mushrooms in order to ensure that the crops we grow provide a good source of nutrition.

Edible fungi are a good source of protein and contain all of the essential amino acids, making them a better meat substitute than most legumes and vegetables. Some mushroom species contain B vitamins as well as vitamins C, K, and E, and most are rich in potassium and phosphorous. Mushrooms contain very little fat, are high in dietary

fiber, and can be prepared in a wide variety of ways. As a food crop, mushrooms can enhance the self-reliance of the campus community by offering a nutritious, popular, locally-produced meat alternative to enrich a varied, well-balanced, and eco-friendly diet.

Objectives

1. To produce approximately 50 lbs of edible mushrooms for consumption at CCAT by Spring 2006.
2. To establish a mushroom garden with an expected life of five years at CCAT.
3. To aesthetically blend with the existing landscape.
4. To provide an opportunity for CCAT co-directors to diversify their diets with mushrooms.

Criteria

1. Cost effectiveness: The most cost effective alternative to get bulk and variety of mushrooms.
2. Productivity: Produce 50 lbs edible mushrooms
3. Ease of maintenance: Maintenance by one person-hour per week.
4. Blend with existing garden/wooded landscape
5. Long-lived: Projected use five years
6. Edible
7. Nutrient value
8. Diverse
9. Appealing to mushroom lovers

Alternative Solutions

Scenario One: Mushrooms take over the world

- Location: The bamboo grove, the children's garden, the artichoke bed, the unused yurt patch. A demonstration mushroom garden kit would also be used for use indoors.

- Species of mushrooms for cultivation: Oyster mushrooms, shiitakes, chicken-of-the-woods.
- Type of substrate: Oysters on straw and on logs in the bamboo grove; shiitakes, chicken of the woods on logs.

This scenario maximizes the use of available space and allows a wide range of garden types.

Scenario Two: Fewer locations, more species

- Location: The children's garden and the bamboo grove
- Species of mushrooms for cultivation: Oyster mushrooms, shiitakes, chicken-of-the-woods, and lion's mane.
- Type of substrate: Oysters on straw; shiitakes, chicken-of-the-woods, and lion's mane on logs.

This scenario provides many types of mushrooms in compact areas.

Scenario Three: Experimental comparison number one

- Location: Half of the artichoke garden
- Species of mushrooms for cultivation: Oyster mushrooms
- Type of substrate: Straw

This scenario provides an experimental opportunity to evaluate mushroom effectiveness as a weed-excluder and promoter of nutrient uptake.

Scenario Four: Experimental comparison number two

- Location: The children's garden (with tomatoes and beans), the bamboo grove, and the artichoke garden
- Species of mushroom for cultivation: Oyster mushrooms
- Type of substrate: Straw and bamboo

This scenario resembles scenario three, but provides an opportunity to evaluate mushrooms' effect on several different crops.

Scenario Five: The Winner

- Location: A recently-cleared plot by the bamboo grove.
- Species of mushrooms for cultivation: Shiitakes, oyster, lion's mane, and chicken-of-the-woods
- Type of substrate: Logs

This scenario allows for a wide range of species in a compact, seldom used area.

Weighing the alternatives

In this phase we compared our alternative mushroom garden scenarios. We prioritized our criteria by consensus. The order of importance is as follows:

1. Ease of maintenance: Maintenance by one person-hour per week
2. Productivity: Produce 50 lbs edible mushrooms
3. Range in variety of mushrooms
4. Appealing to mushroom lovers
5. Nutrient value

6. Blend with existing garden/wooded landscape

7. Long-lived: Projected use five years

8. Cost effectiveness: The most cost effective alternative to get bulk and variety of mushrooms.

Using the list of ranked criteria, the group discussed which scenario to implement as our final solution.

Scenarios One through Four all included straw as a substrate, requiring either labor-intensive annual straw sterilization and replacement, or the purchase of sterilized straw which would be cost-prohibitive.

The first four scenarios also utilized areas with heavy sun exposure, which would increase maintenance by requiring frequent watering and monitoring for mold growth beneath a shade tarp.

Scenarios Three and Four provided only one species, oyster mushrooms, and failed to satisfy our seventh criteria, range in variety of mushrooms. These two scenarios provided an interesting potential for research but were high maintenance, less appealing to mushroom lovers because of their limited species range, and had little potential to fulfill our productivity criteria. Scenarios Three and Four were therefore discarded.

Scenarios One and Two both provided a range of species, but One required high maintenance due to its sprawling character. Scenario Two provided the widest range of species, but was also eliminated due to maintenance requirements.

Scenario Five offers the wide species variety of Scenario Two but requires less maintenance. This scenario fulfills the ease of maintenance requirement because it is

located in the shade and uses logs as a substrate. The productivity criteria will be met by using several logs and species to enhance the chance of survival of more mushrooms. According to Fungi Perfecti, the species we have selected to grow have the potential to produce 92 pounds of mushrooms. This should easily satisfy the 50-pound criteria. According to the distributor, the species we selected are all appealing to fungiphiles both for visual and culinary appeal. The range of mushrooms we chose will provide amino acids and B vitamins and will offer good nutrient value. This scenario allows us to use logs that blend with the natural environment of the bamboo grove and its surrounding redwoods and does not require artificial structures or straw beds. The logs will not require annual renewal and should provide mushrooms for up to five years with little or no maintenance. Due to the donation of logs, the affordability of plug spawn, and the low maintenance it offers, Scenario Five best met our eighth criteria of cost effectiveness.

Scenario Five best met all of our criteria, and was therefore chosen to be implemented as our solution.

Implementation Strategy for Log Mushroom Garden

From the first meeting, our group chose an informal meeting style and cooperative approach. Each of us agreed to divide the work evenly and arrive at decisions by consensus rather than by majority. Due to our small group size (three members) and motivated members this flexible technique has proven practicable and efficient.

Initial research on mushroom requirements and supply sources

This research was performed by all CCAT mushroom garden team members using a variety of online, interview, and library resources. We shared our information in

several team meetings and found that our sources were consistent about how to grow mushrooms on a wood substrate. Among the references was a catalog and web site by Fungi Perfecti. During an early information-sharing meeting the group decided this source could provide the help and supplies we needed, and that the catalog was easier for amateur growers to use than any of the other resources we had found.

Site selection based on available space, ease of access, and suitability for mushrooms

The garden location by the bamboo grove was selected among several offered by CCAT due to its shade, easy access, and compact area, as well as its peaceful surroundings. The specific advantages of each site were discussed during the Weighing the Alternatives phase. The group made the choice through two hours of discussion and arrived at a consensus.

Edible mushrooms selected appropriate for log cultivation

The Fungi Perfecti catalog lists several varieties that grow well on various types of logs. The mushroom garden team chose four types for nutrition content, appealing flavor, interesting appearance, availability by mail order, and ability to grow on readily available oak and alder. This choice was made by consensus, with each variety discussed and agreed upon by all members.

Mushroom varieties:

Lion's Mane Mushroom (*Hericium erinaceus*) Cascading white spines with reported medicinal properties. Lion's Mane is found throughout North America growing on stumps and fallen logs.

Shiitake (*Lentinula edodes*) A very popular medicinal and culinary mushroom, especially in Asia, with a white or creamy mycelium that browns with age.

Pearl Oyster (*Pleurotus ostreatus*) One of the most common mushroom grown on logs. Oyster mushrooms are gaining in commercial popularity and have a mild flavor when eaten young.

Chicken of the Woods (*Laetiporus sulphureus*) A distinctive orange mycelium that forms layered wood conks. Native to North America.

Some mushrooms grow best on conifer logs, others on hardwoods. Oak and alder were selected by the CCAT mushroom garden team because a donation of alder had been offered to the group and inexpensive oak was for sale locally. The team consulted the catalog we had chosen as a source and found that oak and alder would support all of the mushroom types we had chosen.

Budget development and submittal to CCAT for approval

Consulting with CCAT CO-directors gave the mushroom garden team a rough idea of how much money was available for this project. Since all labor is being donated by group members, supplies were the only monetary cost on our budget. Estimates of how much mushroom product we could hope to produce had been included in our research, so adjusting quantities to the rough budget was accomplished through discussion. Using the Fungi Perfecti catalog as a guide, we listed the supplies we would need and looked up the prices. This list was delivered to the CCAT budget director and given an informal approval.

Purchase plug spawn from purveyor

A phone order from Fungi Perfecti using a team member's credit card was completed. Using a CCAT purchase order would have taken several days more than a direct order, so the budget director advised us that this would be acceptable.

Purchase and cut logs

Professor Hansis offered alder early in our mushroom discussions, so Carly and Barbara met at his house with volunteer forester Zach Taylor and cut alder into the 4-foot lengths recommended by Fungi Perfecti, until the chainsaw broke. The group discussed whether to use the amount of alder cut so far as a constraint, to get another saw, or to supplement the log stock with oak for sale in an ad in the local paper. A phone call to Custom Stump Grinders of Arcata determined that the oak was available for a low price and could be cut into 4-foot lengths on site. During our biweekly meeting it was therefore agreed that we should buy the oak. One more meeting was dedicated to buying this wood and hauling it to CCAT. The wood was left to season (decay) for four weeks to allow naturally-occurring anti-fungal compounds within the log to decompose, while we waited for our supplies to arrive in the mail.

Drill, plug, wax, prop, tie

The actual planting of the mushroom plug spawn utilized volunteer labor and drills supplied by the group, and the supplies already purchased. It took 18 working hours to drill 40-70 holes in each of 12 logs, insert wood dowel plugs, and prop and tie the logs together in trios. Approximate work hours for the implementation phase is 30 hours.

Monitoring and evaluation

To monitor the progress and success of our mushroom garden, a log (fig 1) will be provided to allow the CCAT CO-directors to determine the quantity harvested. This may be used for CCAT directors to determine the success of the mushroom project when they fill out the evaluation form.

Date	Type of Mushroom	Cups Harvested	Comments

Figure 1

Evaluation

To evaluate the progress and success of our mushroom garden a questionnaire (Figure 2) will be provided for feedback from all garden users. This will allow anyone who wants to create his or her own mushroom garden to find out what we did that was successful and what we did that was unsuccessful. In addition we will request that each CCAT CO-director fill out the evaluation form at the end of each semester. All completed forms will be added to the mushroom project binder.

Mushrooms at CCAT

Evaluation Form

Date:

1. In what condition is the mushroom garden? Do you find the mushroom garden a pleasant addition to CCAT? (Please take into account aesthetics and usefulness.)

2. Approximately how many cups of mushrooms were harvested by CCAT CO-directors and guests this semester?

Shiitakes:
Oysters:
Chicken of the Woods:
Lion's Mane:

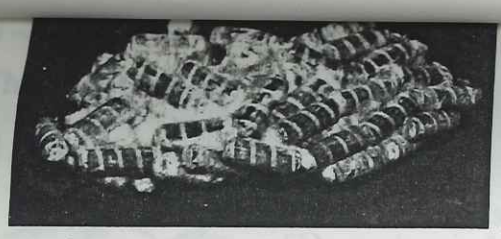
3. What is your favorite mushroom out of the four varieties grown at CCAT?

4. Have you found the mushrooms to be a valuable addition to your diet?

5. Has upkeep been convenient and reasonable?

6. What changes might you recommend to future mushroom farmers who wish to use this project as a model?

Appendix A:
Fungi Perfecti Catalog and Plug Spawn Instructions (Copyrite Paul Stamets)



Thank You

for your purchase of Fungi Perfecti's Gourmet and Medicinal Mushroom Plug Spawn. Our Plug Spawn is made from Certified Organic mushroom spawn, and is currently in use around the world by hobbyists and professional cultivators alike. Log and stump cultivation is the traditional form of cultivation for Shiitake and many other mushrooms, originally developed in Japan. If this is your first experience in mushroom growing, welcome aboard! We think you will find it to be a fascinating and rewarding endeavor.

Following is a list of our gourmet and medicinal mushroom strains. An "X" indicates the species you have received. Keep in touch with Fungi Perfecti, as we are continually expanding our collection of species!

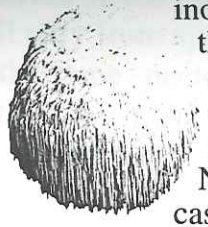
☐ ***Ganoderma lucidum*** **Reishi or Ling Chi**

Known to the Japanese as Reishi and to the Chinese as Ling Chi, this species produces a flat, shelf-like mushroom, with a smooth, lacquered finish. Plug spawn of this species can be inoculated into hardwood stumps or partially buried, horizontally-oriented logs. Reputed to have immune-stimulating properties by both the Chinese and Japanese, *Ganoderma lucidum* has long been used in teas.

☐ ***Grifola frondosa*** **Maitake or Hen of the Woods**

Grifola frondosa grows prolifically on oaks throughout the temperate regions of eastern North America. Only hardwood stumps or partially buried, horizontally-oriented logs should be inoculated. Fruitings most frequently arise at or near the stump/soil interface. Two or three years will often pass before fruitings occur. This delicious mushroom is also heralded in Asian medicine as a powerful immune stimulator.

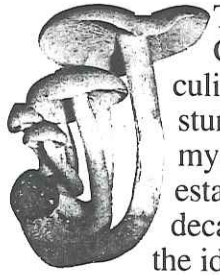
Hericium erinaceus grows primarily on hardwoods, though conifers can also be used with some success. Stumps or logs can be used for inoculation. The spawn plugs should be inserted into the open face of cut stumps. This eminently edible mushroom species is ideal for inoculation into logs or stumps. *Hericium erinaceus* is widely distributed on hardwoods—particularly oaks—across much of North America. These are beautiful mushrooms, with cascading white icicle-like spines, and are some of the best of the edible fungi.



☐ ***Hericium abietis*** **The Conifer Coral Mushroom**

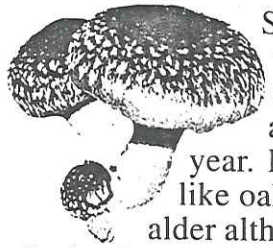
Hericium abietis grows exclusively on conifers and is very similar in appearance to ***Hericium erinaceus***. Native to western North America, the Conifer Coral Mushroom has a delicate and pleasant flavor. Stumps or partially buried, horizontally-oriented logs are recommended for inoculation.

☐ ***Hypholoma capnoides*** **The Conifer Tuft Mushroom**



The Conifer Tuft, also known as the Purple Brown Clustered Wood Lover, is a mushroom of excellent culinary value. An aggressive decomposer of conifer stumps, this mushroom is one of the best candidates for mycoforestry in temperate regions of the world. Once established, a Conifer Tuft stump can produce for a decade or more. (**Please note:** you should be skilled in the identification of this species before attempting to grow it for consumption, as some species that resemble it can be poisonous.)

☐ ***Lentinula edodes*** **Shiitake**

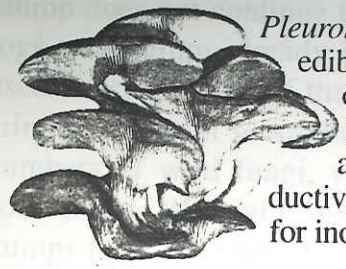


Shiitake mushrooms have been hailed for both their culinary and medicinal benefits in Japan and other parts of Asia for hundreds of years, and their popularity worldwide increases every year. Found primarily on thicker-barked hardwoods like oak, they also do well on "scrub" hardwoods like alder although longevity of the logs will be less than that of other hardwoods. Stumps or logs can be inoculated. When properly cared for, our hardy strain of Shiitake will begin to fruit in as

1–2 years from inoculation.

The Tree Oysters

☐ ***Pleurotus ostreatus*** **The Pearl Oyster**

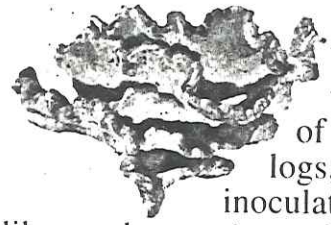


Pleurotus ostreatus is probably the most common edible mushroom found on hardwoods. Growing on alder, cottonwood, poplar, oak, birch, beech, aspen and many other hardwoods, our aggressive strains are renowned for their productivity. Hardwood stumps or logs can be used for inoculation.

☐ ***Pleurotus pulmonarius*** **The Phoenix Fir Oyster**

This member of the Tree Oyster family thrives on conifer stumps and logs, especially spruces and fir. This species enjoys warm climates, producing large, white-beige mushrooms.

☐ ***Polyporus sulphureus*** **Chicken of the Woods**
(=*Laetiporus sulphureus*)



Polyporus sulphureus, "Chicken of the Woods", grows on a variety of hardwoods and softwoods throughout much of North America. Stumps, rather than cut logs, are the recommended candidate for inoculation. Producing a multi-layered, shelf-like mushroom (sometimes called wood conks), Chicken of the Woods has an easily distinguished orange mycelium. Given the right conditions, mushrooms will form in 6–12 months, the stump will begin to decompose, and mushroom crops will form for several years thereafter.

Preparation

Before inoculating your logs or stumps, let your Plug Spawn recover from its journey. Long (and undoubtedly bumpy) trips through the mail or UPS can cause the mushroom mycelium

er, away from direct sunlight, for about a week before using. You can tell if your plugs are ready to be used by inspecting the spiral grooves on the plugs. The level of mycelial growth within the bag will vary from species to species, and even from bag to bag within the same species. If the spiral grooves on each dowel are filled with whitish, fuzzy material, your plugs are sufficiently grown out to be used. Do not open the bag(s) until you are ready to inoculate. Plug Spawn can be stored at room temperature for 2 months or more, but once it is exposed to the outside world it must be used immediately. If for some reason you will not be able to use your Plug Spawn within a two month period, place it in a light-proof container in your refrigerator. There it may stay for as long as six months, growing slowly and becoming more and more suffused with mushroom mycelium. It is even possible that it will begin to produce mushrooms right in the bag. If this occurs, simply remove the mushrooms and use the Plug Spawn right away.

Habitat

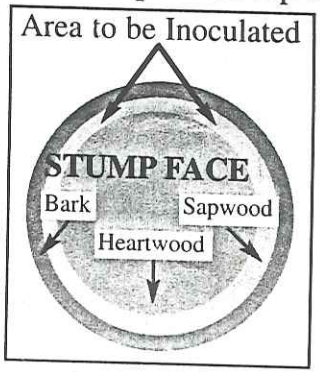
Our Plug Spawn prefers to grow on hardwoods, with some exceptions (which are listed under the species names in the previous section). Most species can be grown on either logs or stumps. Hardwoods such as oak, eucalyptus, poplar (cottonwood), elm and similar woods are very good candidates for log cultivation. Maple is a good wood for growing Reishi, Oyster and Lion's Mane, being both dense and high in sugars. (Some studies suggest that Shiitake yields will be lower on maple than on other woods.) Oak is the best all-around wood for growing Shiitake. Alder is an acceptable wood for Shiitake or Oyster, although the overall longevity of alder logs will be less than that of other, denser hardwoods. Fruit woods such as cherry tend to be too dense for all but the most aggressive of species, such as Oyster, and should generally be avoided. Thick-barked hardwoods are preferable over "paper-bark" woods such as birch, and any log that is shedding it's bark should not be used. Logs should

Cutting your logs in the late Winter or early Spring helps to insure that they have a high sugar content. Stumps—particularly those of newly fallen trees—should be girdled, i.e. the bark from the bottom 2" around the stump should be removed, to insure that the stump does not continue to grow after plugging. Please note that logs and stumps already inhabited by other fungi should not be used for cultivation. If the candidate logs/stumps you are considering have sat for several seasons among other trees bearing large numbers of wild fungi, you may wish to search elsewhere for your wood. We highly recommend protecting your cut logs or stumps from the spore-fall of mushrooms in the wild; the rain of millions of spores upon the faces of newly-cut logs can result in logs already colonized with "uninvited guests" before you get a chance to use them yourself. Freshly-cut logs should not be immediately inoculated; trees naturally produce anti-fungal compounds, which degrade in two to three weeks from cutting. Aged deadwood is also not recommended for plugging, as it has a poor nutrient base for supporting mushroom growth. Logs or stumps with fine cracks (called "checks") running through them are more quickly colonized with mushroom mycelium than those without.

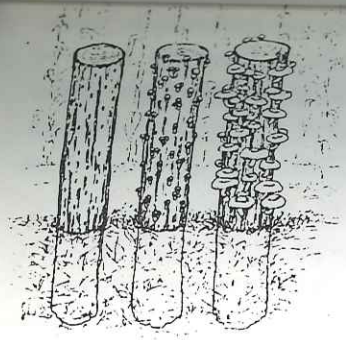
Procedure

The best time to plug your logs varies depending on your location. In the Northern latitudes, plugging should take place no earlier than mid- to late April. In warmer climates such as those in Southern states or Hawaii, inoculations can take place nearly year 'round. A good basic rule for inoculations in the Spring is not to plug until well after your last frost. For Fall inoculations, make sure you have at least two weeks before consistently freezing temperatures set in. This window of opportunity is greatly expanded if you have a protected area in which to place your newly plugged logs, such as a garage, root cellar, shed, barn or other outbuilding.

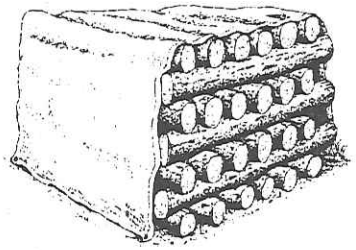
Logs should be cut to lengths of 3–4 feet, and are best if they do not exceed 14 inches in diameter. Use a 5/16" drill bit in a high-speed drill to drill 2-inch-deep holes no more than 4 inches apart, in an evenly-spaced "diamond" pattern along the full length and circumference of the logs. Stumps should be inoculated along the circumference of their face, in the border between the bark and the heartwood (see diagram below). Insert 1 plug per hole and whack it in with a hammer. A 3–4 foot log can take 50 or more plugs, while stumps usually hold 30–50 plugs. Holes can be sealed with cheese wax or beeswax to protect the mycelium while it is growing. You can also paint or dip the ends of your logs in wax to help them retain moisture. (While helpful, using wax is not absolutely necessary for successful log cultivation.) After plugging, logs can be stacked in criss-cross piles called "ricks" to help conserve moisture. Logs can also be buried in the ground, either horizontally or vertically, with a buffer of fresh sawdust, sand or gravel. to help in the retention of moisture. You can even cut short sections of log (2–3 feet is ideal) and "plant" them in pots of sand. We do not recommend burying your logs in dirt; this will cause the logs to rot more quickly (resulting in fewer mushrooms), and dirt may contain bacteria or other organisms that are harmful to your fungi.

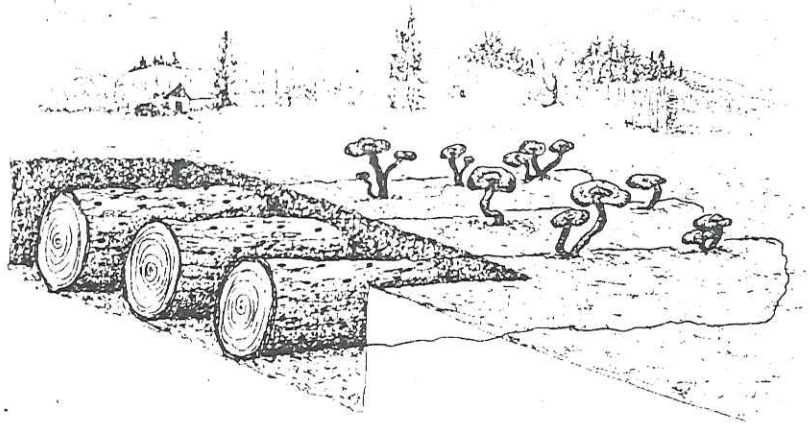


Reishi growing on an alder log, partially buried in a pot of sand



should be buried so that the top third of the log is above ground. This method should only be used with ironwood or other dense woods. Logs that are inoculated with species that must be partially buried in order to fruit can be incubated above ground, then buried when they are ready to fruit. Ricks should be located in a shady area, under dense forest canopy or a shade cloth. Likewise, candidate stumps should be situated in a similar environment. You can often tell a good spot to place your logs by looking for "indicator species" such as rhododendrons, native fungi, or other organisms which also prefer low levels of sunlight. Logs should be placed so that they are off the ground, on pallets, cinder blocks or other logs. Water your logs once or twice a week for 5–10 minutes at a stretch until freezing temperatures or heavy rains begin. You can help to keep water loss to a minimum by "tarping" your logs with a sheet of burlap, shade cloth or a product like Bugout™ cloth. Place boards or similar braces on top of your logs under the tarp to keep the tarp sus-



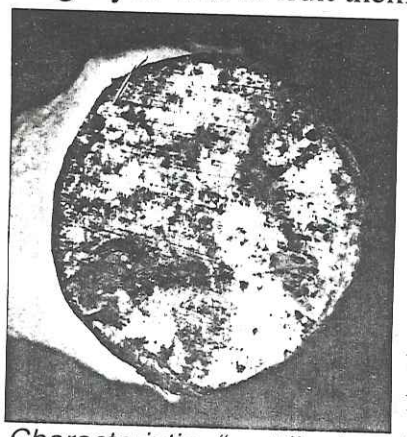


cover your logs; this will cause mold to form.

Now that you have plugged, watered and tarped your logs, the next important step is to....wait. Your logs or stumps are now in a state of incubation, and will require 6–12 months for the mushroom mycelium to colonize the wood. They need only be watered once a week (or not at all, if you live in a particularly rainy climate). Logs at this stage seem to do best when ignored almost entirely; Paul Stamets, author of ***Growing Gourmet and Medicinal Mushrooms***, refers to this as "the Strategy of Benign Neglect".

Fruiting: Initiating the Crop

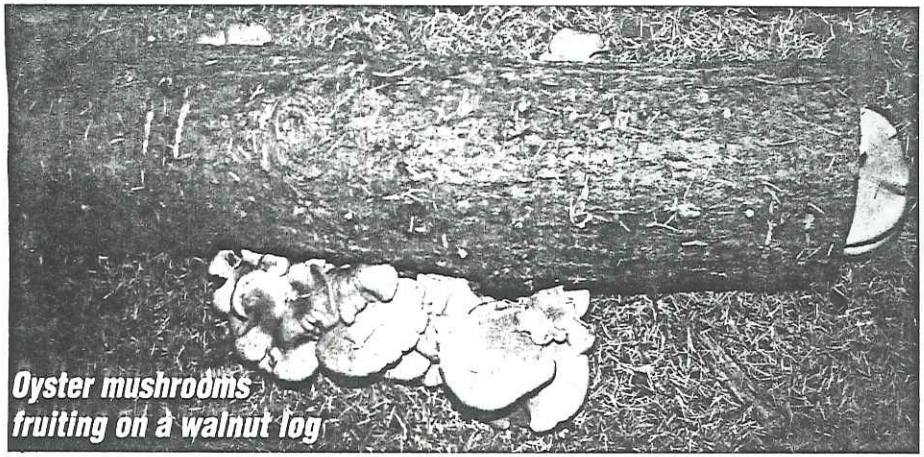
Some logs are ready to fruit in as little as 6 months, but the longer you wait to fruit them, the greater the level of colonization. 9–12 months from inoculation is preferable. You can check the progress of colonization by carefully chipping away a section of bark around one of the plugs. If the area around the hole is run through with fine white fibers (called "hyphae"), then colonization is proceeding normally. Tarped logs will often show mushroom mycelium collecting on either "face". When you are ready to fruit your logs or stumps, you can either submerge your logs in a tank or bathtub, or you can water them with a hose or sprinkler. Water or soak them for 24 hours (remember to avoid using chlorinated or distilled water for soaking; spring, well or rain water is best, although boiled tap water will also work well. Chlorinated water is okay for watering your logs). This soaking is known as an "initiation strategy". Afterwards, keep the logs untarped, watering them 2–3 times a day, depending on the weather in your area. Stumps



Characteristic "mottling" of mycelium at the end of a log that is ready to fruit

more, depending on weather conditions. Mushrooms should begin to form within 2 weeks of initiation. Mushrooms will often form where the holes were originally drilled, though they will also grow wherever cracks or holes appear in the bark. Mushrooms can be harvested approximately 2 weeks after they first appear, although natural factors such as temperature and humidity might affect growing time. ***Note: never eat a mushroom unless you are sure of its identification.*** The first time you eat any mushroom new to you, consume a small portion and wait 24–48 hours. If no undesirable effects occur, you may safely assume that you do not have an allergy to this mushroom. A small percentage of the population (estimated at 1–2%) are "allergic" to mushrooms, that is, that their bodies can not produce the enzymes necessary to digest them. They typically suffer temporary, albeit unpleasant, gastro-intestinal discord. We do not recommend that you eat any mushroom raw.

After you have harvested your first flush, your logs will usually lapse into a period of dormancy. If they do not fruit again immediately after the first flush, let them sit for 2–3 weeks before re-initiating them. Stumps will often fruit continuously during the rainy season, with no dormancy. Logs may remain dormant for as long as 8 weeks, depending on a number of variables. After the dormancy period, re-initiate the logs by soaking or watering them for 24 hours. This cycle of growth and dormancy will continue throughout the warmer months, giving you a total of 4–6 flushes per year.



Oyster mushrooms fruiting on a walnut log

Final Thoughts

Log and stump cultivation of mushrooms has a long and prosperous history in Asia, and has grown increasingly popular in Europe and the Americas over the past few decades. Many people have founded successful businesses based on the techniques outlined in this booklet, and countless more have enjoyed log/stump cultivation as a satisfying hobby. However, it should be noted that log/stump cultivation is a practice that is subject to the whims of nature. Some of the most significant factors determining the success of a given cultivation project are ones over which we have no control: temperature, humidity, climate, insects and competitor fungi, to name a few. If you are interested in learning more about the mushroom life cycle and both indoor and outdoor cultivation of fungi, we highly recommend the books ***Growing Gourmet and Medicinal Mushrooms*** and ***The Mushroom Cultivator.*** These books are available through us here at Fungi Perfecti.

Like many other endeavors, log and stump cultivation of edible fungi requires patience, time and a little luck. We trust you will find your experience will be an enjoyable and "fruitful" one!

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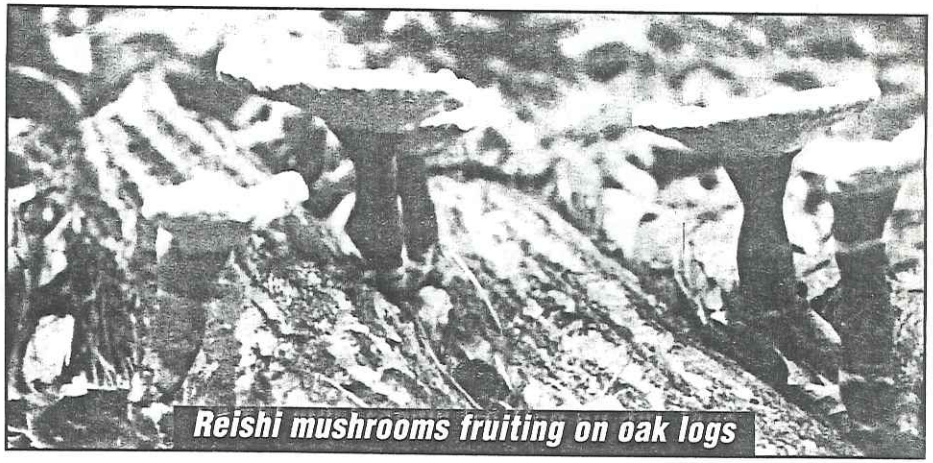
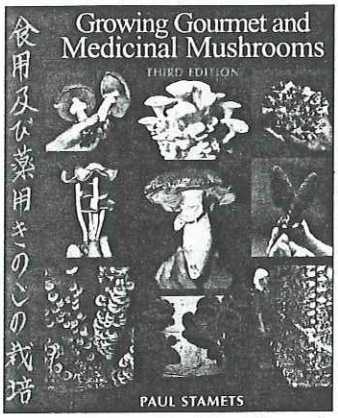


Reishi mushrooms fruiting on oak logs

Any Questions? Need More Information?

Should you have any questions, call our **Mushroom Hotline** at **(360) 426-9292**. Our hours are 8:30 am–4:30 pm Pacific Time, Mondays through Fridays. We will be happy to help you! We also offer technical support for our products via the Internet at **mycomedia@aol.com**.



For more detailed information on mushroom cultivation, we suggest you consult the book ***Growing Gourmet & Medicinal Mushrooms***, available from Fungi Perfecti for **$44.95** plus **$5.50** shipping and handling. This book explains in detail cultivation techniques and growing parameters 0for 31 different edible and medicinal mushroom species. With 592 pages and more than 400 photographs and diagrams, this is the definitive text on mushroom cultivation for hobbyists and professionals alike.

We supply and instruct mushroom growers ***world-wide****, amateurs and professionals alike. Contact us via phone, fax or email for a free color brochure. For a copy of our complete cultivation equipment catalogue, send check or money order for* ***$3.00*** *plus* ***$1.50*** *shipping & handling.*

If you purchased this Fungi Perfecti® product from another retailer or catalog company, please offer them the courtesy of your continued business. Thank you!

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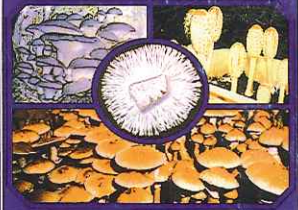

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BY PAUL STAMETS AND J.S. CHILTON

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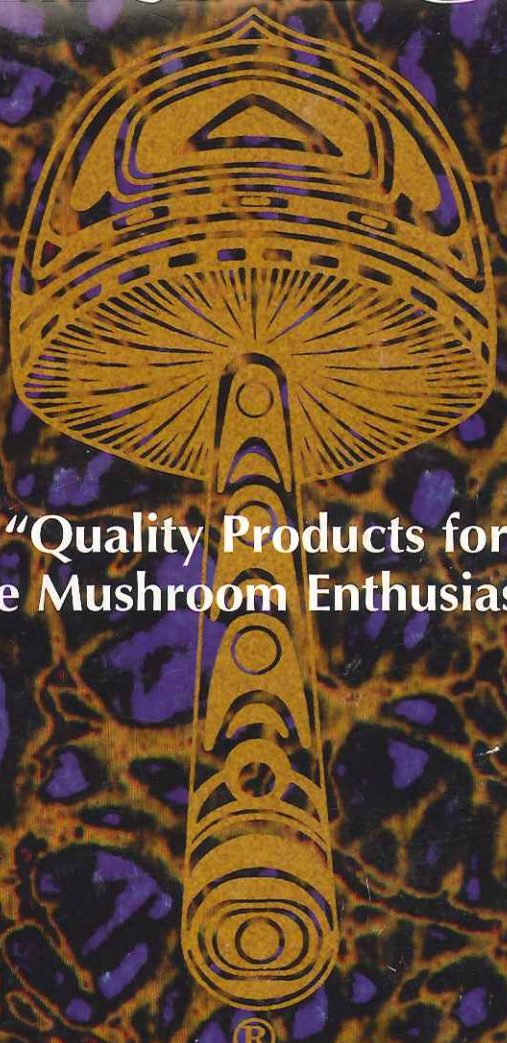

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Fungi Perfecti *(**fun** ji' per **fect'** i)*

The unofficial name for the Subdivision hosting what we call mushrooms. Mushrooms are fleshy fungi that reproduce through sexual matings of spores. Asexually reproducing fungi, like Penicillium, typify the molds of the Fungi Imperfecti.

Fungi Perfecti is a family owned business dedicated to promoting the cultivation of high quality gourmet and medicinal mushrooms. In business since 1979, we have been instrumental in developing new technologies and markets for gourmet mushrooms throughout the world.

We keenly sense that fungi will play a pivotal role in new industries of the 21st Century. Gourmet and medicinal mushrooms will continue to appeal to organic gardeners, commercial cultivators, researchers, nutritionalists, and ecological managers. Indeed, we forsee a quantum leap in their popularity when the public realizes that these fungi:

- ***stimulate the immune system***, helping the human body resist and fight viral diseases and cancers.
- ***lower cholesterol levels.***
- represent a ***pesticide-free alternative*** to the traditional white button mushroom.
- are instrumental in the ***recycling*** of wood and agricultural by-products.
- can easily be grown by everyone—outdoors in your garden or yard ***(mycological landscaping)***—or indoors within greenhouses, solaria, or controlled environments.

Through our in-depth classes and information networks, we encourage the establishment of a constellation of independent, organically minded growers whose collective consciousness will define this emerging industry well into the next century. We hope you will join us in this endeavor. The future is ours.

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Introduction

Only recently has the cultivation of exotic mushrooms become a practical endeavor. Cultivating mushrooms is not necessarily difficult: it requires only a willingness to learn, a little work, and adherence to some well defined guidelines. Most importantly, the mushroom cultivator needs continual access to accurate information and state-of-the-art technology.

Mushrooms can be grown throughout the year indoors or during a few months outdoors. One of the most exciting innovations in mushroom culture is a concept **Fungi Perfecti** has been instrumental in promoting: **Mycological Landscaping**. Mycological landscaping involves the cultivation of exotic mushrooms as beneficial companions to plants in gardens, lawns, or within woodlands. **Fungi Perfecti** has been actively searching the wild for candidates having strong potential for culinary value. Each year we clone dozens of species having gourmet appeal and test them at our research facility—indoors and outdoors. Imagine having a selection of choice exotic mushroom patches, protected in the privacy of your backyard, to be enjoyed through the seasons and perhaps through generations!

For everyone seriously contemplating mushroom cultivation as a business, we urge you to learn the sterile culture skills necessary for spawn production. You will be glad you did. Armed with the skills of sterile culture the mushroom grower:

- ***reduces a substantial expense.***
- ***is able to use more spawn per inoculation,*** thus accelerating the spawn run into the fruiting substrate. (For sawdust/compost cultivators, this also means the spawn can become the vehicle for nutritional supplementation.)
- ***gains invaluable insights into and sensitivity to the mushroom life cycle.***
- ***eliminates an excuse for failure,*** thereby climbing the learning curve faster than competitors.
- ***controls, selects, and improves on high yielding strains.***

Central texts in helping the aspiring spawn maker to achieve these skills are ***The Mushroom Cultivator*** and ***Growing Gourmet and Medicinal Mushrooms***, treatises we highly recommend and that are in use worldwide.

"Thank you Paul Stamets for your two great books, they allowed me to start an 800 lb./day Agaricus farm in no more than 7 months."

Nazem Ghandour
Le Champignon Parfait, Tripoli, Lebanon

"We have been producing the Himematsutake in Brazil for more than a year, and that wouldn't have been as successful as it is without two of your books: 'Growing Gourmet and Medicinal Mushrooms' and 'The Mushroom Cultivator'."

Rodrigo Henriques
Royal Sun, Asa Norte, Brazil

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For our international customers and anyone who may not be aware of it, cultivation, possession and/or distribution of any mushroom that produces psilocybin or psilocin is illegal in the United States. Fungi Perfecti does not sell spores or cultures for any psychoactive mushrooms. Please do not call us with questions concerning these mushrooms, and put us in the position of having to refuse service to you.

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XIX. DATA TABLES

Steam / Heat Data Tables

1 Boiler HP = 3.5 lbs. water evaporated per hour from and at 212° Fahrenheit.

1 Gal. water yields 8,000 BTU per hour from and at 212° Fahrenheit.

1 Gal. water yields 2,016,000 calories.

1 BTU = 252 calories = the heat energy needed to raise 1 lb. water 1° Fahrenheit.

1 Calorie = the heat energy needed to raise 1 gram water 1° Centigrade.

Electrical Data Tables

1 Kwhr = 3413 BTU Watts = Amps x Volts

746 Watts = 1 HP 16 Amps = 1 HP

Water Data Tables

1 liter water = 1,000 ml. = 1,000 grams.

1 gallon water = 8.34 lbs.

1 cu. ft.water = 62.41 lbs. @ 50° Fahrenheit.

1 level tablespoon of Malt Extract Agar = 7 grams.

°F = (°C x 9/5) + 32 °C = (°F -32) x 5/9

Air Movement Data Tables

Percentage of air allowed to vent from poly ducting in Grow Room for proper inflation of ducting : 75–80%.

Increase in static pressure in ducting over distance: .25–.3" per 100 feet.

To match a HEPA filter to a fan: divide CFM of fan @.8" SP by square footage of filter. Ideal result should be between 200–400.

Grain / Water Formulae

Quart Mason Jars:	1/2 Gal. Mason Jars:
200 grams rye	480 grams rye
200 ml. water	400 ml. water
1 gram gypsum	2 grams gypsum

I. HOW TO GROW MUSHROOMS

A Simplified Overview of Mushroom Cultivation Strategies

Mushrooms reproduce through spores. In the highly competitive natural world, the chances of mushroom spores germinating and then producing a mushroom are slim. Within a laboratory, isolated from airborne contamination, the probability of success is much improved. What a cultivator does is remove a select species from the fierce competition of outdoors into an optimized environment indoors wherein the mushroom mycelium grows unhindered from the ravages of nature. This harbor of quiet refuge is, in effect, the sterile laboratory. Contrary to popular belief, such an inoculation room can be easily constructed at modest expense within your home.

A mushroom culture can be taken from spores or from tissue. In germinating spores, many strains are formed, some compatible with one another, some not. In taking a tissue culture (clone) from a living mushroom, the cultivator preserves the exact genetic character of the contributing mushroom. With spores, a single strain must be selected from the multitude of strains created. In both cases, the result is a network of cells called, collectively, **the mushroom mycelium**.

Once a pure strain has been developed, the next step is to increase the **mycelial mass**. This is done by first growing the mycelium on enriched agar media in a petri dish and then on grain or sawdust/bran. On the flat, two dimensional plane of a petri dish, contaminants such as molds and bacteria become readily apparent. Since it is easy to see if mushroom mycelium is pure and free of contamination, experienced cultivators propagate mycelium in petri dishes and then inoculate grain or sawdust/bran that has been sterilized in jars. When these grain or sawdust filled jars (denoted as **G^1 Masters**) have grown through with mushroom mycelium, they are called **spawn**, and either can be individually used to inoculate another 10 to 20 more grain-filled jars, designated as (G^2), or to inoculate bulk substrates such as straw, wood, or compost. G^1 masters are best grown out in regular mouth quart mason jars; G^2 spawn is best grown out in half gallon and/or gallon jars. Another generation of spawn, designated as G^3 can be created from G^2, if desired. No more expansions from grain-to-grain transfers should be made beyond G^3 as contamination often can occur and not be detected until it is too late.

In contrast, liquid culture allows a cultivator to use as little as one mycelial culture from a single petri dish to inoculate hundreds of grain jars in a fraction of the time it takes with the above-described method. Of course, preferences vary with every cultivator. Mushroom tissue culture is a highly individualized art. However, **FP** promotes liquid culture as a revolutionary improvement over the more labor intensive, traditional methods.

With many species, grain spawn can be laid out into trays, cased with a moisture-laden soil-like layer, and fruited. Once tissue culture is mastered, this is the simplest way to grow mushrooms. It is also a proven way to "screen" strains for their cultivation potential.

Since the biomass of mushroom mycelium will be exponentially multiplied from a small fragment of mycelium, the sterility of the laboratory is of paramount importance. Micron filters (used in laminar flow hoods) solve the problem of contamination in the laboratory and they more than pay for themselves considering the contamination they prevent and the cultures/time they save.

To the beginner, sterile culture may seem too difficult an adventure to embark upon. The possible pitfalls of sterile culture can be avoided by buying ready-to-inoculate spawn until a familiarity with the process is attained. ***Ultimately, however, every cultivator should create their own spawn so they are not forever dependent upon others.***

Once pure spawn is obtained, the next step varies with the species being grown. Shiitake ***(Lentinula edodes)*** calls for the inoculation of oak logs or sawdust/bran blocks. Oyster mushrooms ***(Pleurotus spp.)*** fruit admirably on pasteurized straw. The King Stropharia or Garden Giant ***(Stropharia rugoso-annulata)*** enjoys a habitat composed of wood chips and/or wheat straw. Morels ***(Morchella spp.)*** are most easily grown outside in shady sawdust/ash beds. The Chinese Ling Chi, also known as the Japanese Reishi ***(Ganoderma lucidum)*** can be grown outdoors on logs buried in sawdust. Chicken-of-the-Woods ***(Polyporus sulphureus)*** can be grown on stumps, as can many other gourmet species. Lastly, the classic white button mushroom ***(Agaricus brunnescens)*** fruits on horse manure/straw compost. Most mushrooms capable of being cultivated will fruit on one of these aforementioned substrates.

After the mycelium has fully colonized the substrate, mushroom formation should be encouraged. In general, the key to fruiting mushrooms relies on altering the surrounding environment. To change a set of environmental variables in favor of mushroom formation is called an **Initiation Strategy**. Mushrooms form best when:

- ***the temperature for spawn run is lowered to a temperature plateau ideal for fruiting***
- ***water is applied***
- ***humidity is raised***
- ***carbon dioxide is lowered by increasing air exchanges***
- ***light is introduced & maintained (with a few exceptions)***

Considerable variation exists between species in their fruiting requirements and this subject cannot be adequately discussed here. Hence, we recommend the most comprehensive books on the subject ***Growing Gourmet & Medicinal Mushrooms*** by Paul Stamets and ***The Mushroom Cultivator*** by Paul Stamets and Jeff Chilton. More books by Paul Stamets are being written detailing these concepts. By remaining in contact with Fungi Perfecti, you will be assured of having the latest State-of-the-Art information and technology.

Good luck. May your fruitings be bountiful and your lives enriched by the experience of cultivation. Mushrooming is the best combination of a passionate art and a rapidly emerging science. Each one of you can make a contribution. We hope you do.

XVIII. MUSHROOM RECIPES

Paul & Dusty's Ultimate Shiitake Recipe

Mix in a bowl the following ratios:

Paul's Version	**Dusty's Version**
70% olive oil	1/8 cup olive oil
15% sesame oil	1/8 cup sesame oil
10% tamari or soy	4–5 tablespoons tamari
5% white wine	2 glugs and 1 splash
pinch of black pepper	of white wine
1–2 cloves of crushed garlic	

Stir vigorously as the ingredients tend to separate. Set aside. Take a pound of fresh, *whole* Shiitake mushrooms. Cut the stems from the caps. Place gills facing up. Do not slice mushrooms. (The stems can be dried and used for a soup base or discarded.) Pour the above sauce onto the mushrooms and stir, making sure the gills become saturated with the sauce. In a 350° F. oven, bake uncovered for 30–40 minutes. Or you can barbecue on an open grill. The smoky flavor makes it even better. Yum! Serve hot with seafood, rice, pasta or whatever. Unbelievably good.

*Shiitake Hazelnut Vegetarian Paté**

4 oz. Shiitake Mushrooms	1/8 tbsp. thyme
3 tbsp. butter	1/4 tsp. salt
1 clove garlic, minced	1/8 tsp. pepper
1/4 cup toasted hazelnuts	2 tsp. dry sherry
3 oz. Neufchatel cheese	1 tsp. fresh parsley

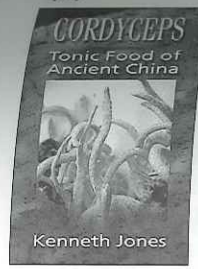
Trim and discard woody ends from mushrooms. In a food processor, finely chop mushroom caps and stems. Melt butter in a medium skillet. Add mushrooms and garlic and saute for at least 5 minutes. Stir in thyme, pepper and salt. Chop parsley in food processor. Add hazelnuts and process. Add Neufchatel cheese and process until smooth. Add sherry and mushroom mixture, and process until well-mixed. Spread or mold in serving dish. Cover and chill for at least 1 hour. Serve with crackers. Yields 1 cup. Other mushrooms can be substituted for or combined with Shiitake.

Maitake Rice Pilaf

2 cups washed, uncooked white, brown or wild rice	4 cups chicken or bean stock
2–3 cups chopped Maitake mushrooms	1 cup lentils, cooked
1 cup coarsely chopped celery	1 cup coarsely chopped onions
1 cup chopped peanuts or almonds	2 cloves garlic, minced
1 tbsp allspice	1 tbsp parsley
Salt, pepper, cayenne pepper to taste	3 tbsp. olive oil

In a medium skillet, saute mushrooms and garlic in olive oil over medium-high heat for 15 minutes, adding parsley, onions, celery and pepper after 10 minutes. Add rice and stir for another 3 minutes, then add stock, lentils, allspice and salt. Stir again, then let sit until mixture is boiling gently. Reduce heat and cover. Let simmer for 20 minutes, then check mixture. If all of the liquid has cooked out by that time, add 1/2 cup extra liquid (extra stock, some sherry, some soy sauce, etc.). Add salt, cayenne pepper to taste, peanuts/almonds, and cook for 15 more minutes. Let cool uncovered for 5 minutes and serve with a dollop of plain yogurt on top.

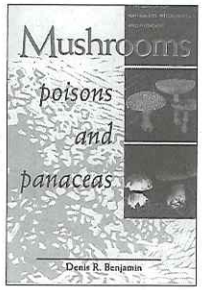
*Reprinted from ***Growing Gourmet and Medicinal Mushrooms,*** by Paul Stamets.



Cordyceps: Tonic Food of Ancient China
By Kenneth Jones. This booklet is a fascinating discourse on Cordyceps, a medicinal mushroom also known as the Caterpillar Fungus because of its parasitic growth on caterpillar larvae. Heralding from the highlands of the Himalayas, Cordyceps has been used in Asia for centuries as an aphrodisiac and to invigorate the body. Cordyceps has also gained international interest from athletes due to its stamina-enhancing abilities. 52 pages, including a 10 page bibliography.

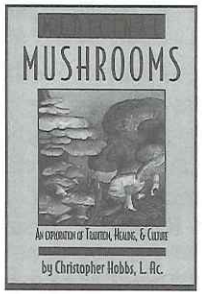
MCTF (.5 lb.).....**$ 5.95**

Mushrooms: Poisons & Panaceas



By Dr. Denis Benjamin. In this comprehensive and most up-to-date treatise on mushroom toxins, Denis Benjamin covers a wide range of subjects, from the nutritional and medicinal aspects of edible mushrooms to the deadly toxins in the Amanitas. Also included is an essential guide to correctly diagnosing and treating mushroom poisoning—what to do and what not to do. This book is an essential and welcome addition to the library of every dedicated mushroomer. 416 pages, 56 illustrations. Softcover.

MMPP (2 lbs.).....**$ 34.95**



Medicinal Mushrooms:
An Exploration of Tradition, Healing, & Cultures
By Christopher Hobbs. This book covers a wide range of mushrooms used throughout the world for medicinal purposes, with notes on history, use, and methods of preparation. This book is an important bridge between East & West, enlightening to read, and filled with useful references. 252 pages. Softcover.

MMME (2 lbs.).....**$ 16.95**

Reishi Mushroom: Herb of
Spiritual Potency and Medical Wonder

This book examines the history and use of Reishi, known by the Chinese as **Ling Chi**, and to mycologists as ***Ganoderma lucidum***. Full of anecdotal reports, Dr. Terry Willard discusses the medical properties of Reishi and its heralded place in Eastern history and medicine. 167 pages. 8 pages of color plates. Softcover.

MRHW (2 lbs.).....**$ 16.95**

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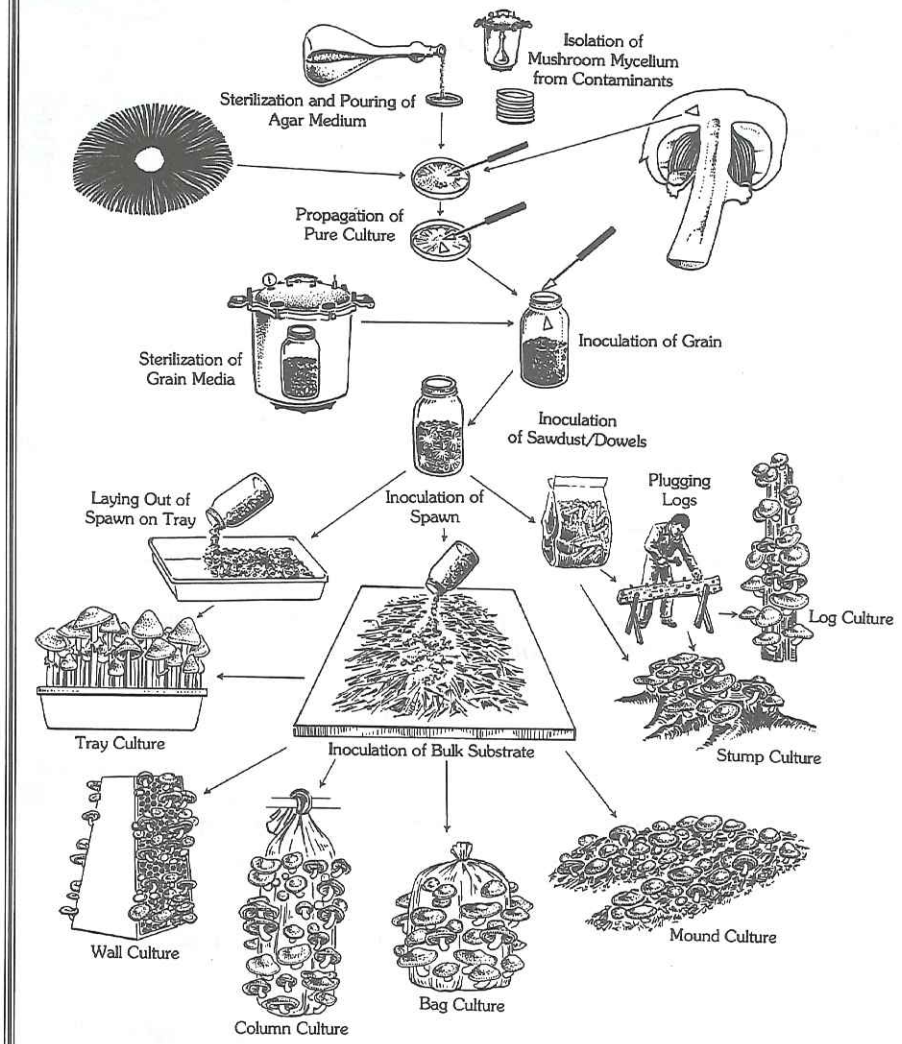
Since the biomass of mushroom mycelium will be exponentially multiplied from a small fragment of mycelium, the sterility of the laboratory is of paramount importance. Micron filters (used in laminar flow hoods) solve the problem of con-

OVERVIEW OF TECHNIQUES FOR THE CULTIVATION OF MUSHROOMS



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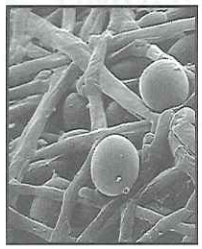
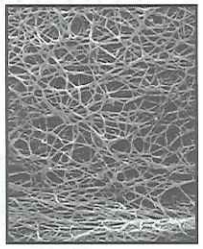


HELPING THE ECOSYSTEM THROUGH BIOREMEDIATION WITH MUSHROOM MYCELIUM

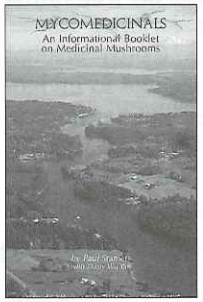


Bioremediation is the use of microorganisms to degrade contaminants, pollutants and/or other waste products. Until recently, much of the research has concentrated on the lower fungi. We now know that the higher fungi—mushrooms—have equal or greater potential for doing the same.

Fungi Perfecti is actively seeking applications of this developing mycotechnology. Areas in which the higher fungi have demonstrated potential for remediation include:

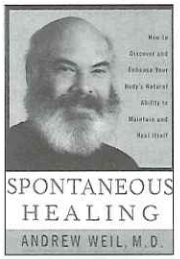
1) the de-caffeination of coffee wastes paired with oyster ***(Pleurotus spp.)*** mushroom production. Caffeine contamination of water sheds represents a major ecological disaster in coffee growing regions of the world. Oyster mushrooms can be grown on a wide variety of coffee wastes, producing commercial crops, destroying the majority of the caffeine in the process, and rendering the substrate into secondary products.
2) the decomposition of hydrocarbon-based contaminants, including petroleum-based products such as creosote, oil and pesticides.
3) the de-nitrogenation of nutrient enriched substrates.
4) the filtering of harmful bacteria from watersheds.
5) the concentration and removal of heavy metal based contaminants

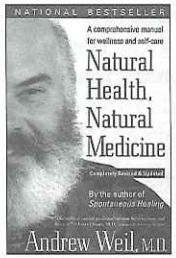
With the exception of de-caffeination, the current state of knowledge on these applications is promising but still is in the formative stages. Fungi Perfecti has the strains, and the facility for projecting mycelium *en masse*. We are very familiar with acclimating mycelium to outdoor environments. Those interested in applying these technologies are invited to contract with us for our services. Serious inquiries only, please.



MycoMedicinals®: an Informational Booklet on Medicinal Mushrooms
In response to growing public interest in Fungi Perfecti's MycoMedicinal® products, Paul Stamets has assembled a comprehensive reference booklet on the medicinal properties of a select group of mushrooms. Nine different species are detailed: Reishi, Maitake, Yun Zhi, Zhu Ling, Lion's Mane, Himematsutake, Enokitake, Shiitake and Cordyceps. This full-color resource guide includes answers to frequently asked questions and an extensive bibliography. 48 pages, softcover.
MMMM (.5 lb.).....**$ 5.95**

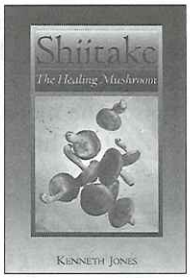
Spontaneous Healing: How to Discover & Enhance Your Body's Natural Ability to Maintain & Heal Itself
In this national best-seller, Andrew Weil discusses natural and non-invasive methods for activating the body's self-healing properties. Medicinal mushrooms are highlighted as one of several potent tonics for stimulating the immune system. Hardcover. 310 pages.
MSHA (2 lbs.).....**$ 22.95**





Natural Health, Natural Medicine by Dr. Andrew Weil. Subtitled "A Comprehensive Manual for Wellness & Self-Care", this 353 page book describes natural remedies for a variety of illnesses with particular emphasis on diet and exercise. Dr. Weil strongly encourages the consumption of gourmet mushrooms, particularly Shiitake, Enokitake, Zhu Ling and Reishi. A great book by a great man. 370 pages, softcover.
MNHN (2 lbs.) .....**$ 11.95**

Shiitake: The Healing Mushroom
By Kenneth Jones. This 120 page book delves into the health benefits of the Shiitake mushroom. Tracing its ancestral use to present day medical studies, the author discusses and documents many of the claims for this increasingly popular species. The book includes chapters on the cancer-reducing, anti-cholesterol, anti-Chronic Fatigue Syndrome (CFS), anti-viral, and anti-HIV effects of Shiitake mushrooms in their natural form and/or their extracts. Softcover.
MSHM (.5 lb.).....**$ 8.95**



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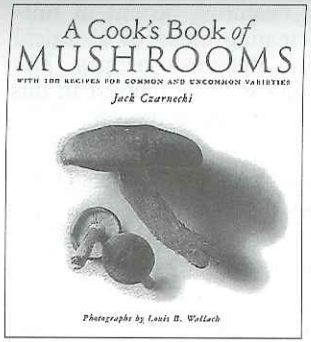
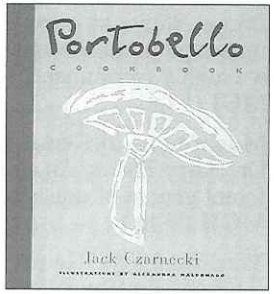


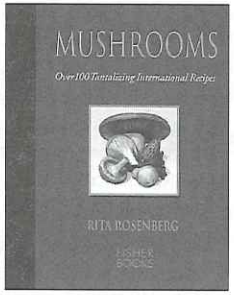
A Cook's Book of Mushrooms
By Jack Czarnecki. Complete with 100 recipes covering the savory delectation of Shiitake, Oyster, Portobello, Enoki, Morels and Chanterelles, this book has been prepared by the consummate mushroom chef of this century. 25 color plates. Hardcover.
MCBM (3 lbs.).....**$ 29.95**



Portobello Cookbook
By Jack Czarnecki. The newest collection of recipes from the author of ***Joe's Book of Mushroom Cookery*** and ***A Cook's Book Of Mushrooms***, this book celebrates the ever-popular Portobello in forty recipes that cover everything from basic preparations to main courses, side dishes and snacks. **Portobello Cookbook** is a welcome addition to any cook's collection! 88 pages. Hardcover.
MPOR (1 lb.).....**$ 14.95**

Taming the Wild Mushroom
By Arleen R. Bessette & Alan E. Bessette. This is one of the best cook books we've seen. Expounding on 57 recipes, with 75 exquisite color plates in 125 pages. Hardbound.
MTWM (2 lbs.) .....**$ 24.95**

Hope's Mushroom Cookbook
By Hope Miller. This book was written by an expert with decades of experience cooking gourmet mushrooms for the most critical of audiences—mushroom experts from the far reaches of the world. In this 222 page book, Hope Miller features her favorite recipes. Spiral bound.
MHMC (2 lbs.).....**$ 19.95**



Mushrooms: Wild & Tamed
By Rita Rosenberg. Written by an instructor in the culinary arts, many have been the beneficiary of her imaginative and delicious fungal creations. Rita's inventive recipes have excited participants at the Telluride Mushroom Festivals for years. Softcover, 192 pages, 125 recipes. Softcover.
MWT (2 lbs.).....**$ 12.95**

Special Interest

Mushrooms For Color
By Miriam Rice. The wonderful thing about studying mushrooms is that there seems to be no end to their diverse uses. In this book, Miriam Rice shows how mushrooms can be a fantastic source for dyes. The colors derived from mushrooms span the rainbow. She outlines the techniques for extracting and fixing colors to silk, cotton, or wool. 154 pages, softcover.
MCOL (1 lb.) .....**$ 15.95**

III. HOW TO PLACE AN ORDER

Before placing an order, please read the Terms of Sale / Mandatory Liability Release on page 77 of this catalog.

To place an order, fill out one of the order forms from the back of the catalogue, listing the quantity, product number, description and price. Add the shipping costs (items are sent UPS Ground unless otherwise specified—for shipping rates, please consult the rate sheet included with this catalog). The shipping weight is shown in parentheses ( ) to the right of the item code for each item. An item code followed by a "†" indicates an item that must be shipped in its own box with no other items (such as rye grain). If you cannot determine the shipping costs of your order, please call. Upon entering your order into our system, an order number will be assigned. This number will appear on all invoices and correspondence pertaining to the order in question. Please refer to it when making inquiries. Plan well in advance so our service can satisfy your expectations. Money orders, credit cards and wire transfers facilitate the shipment of your order. Personal checks may delay your order a few days, especially with large orders. U.S. funds only. Feel free to call to check on inventory and lead times. We want to give you the best possible service. To eliminate possible returns, orders must be accompanied by a phone number.

Generally orders are shipped within one to five days. For our **Priority #1 Service**, we guarantee shipment within **24 hours** for an additional service charge of **$10.00**, subject to availability of the merchandise being ordered. To receive this speedy handling, confirmation by phone must occur before placing your order. We guarantee your order will be shipped within 24 hours or the $10.00 fee will be promptly refunded. Because of the large volumes of orders we are now processing and due to the urgency of some cultivator's needs, this policy has become mandatory. Please note that the **Priority #1 Service** does not, in itself, expedite the method of shipping.

Purchase Orders: We accept Purchase Orders from universities and schools in the United States and Canada only. We provide proforma invoices to companies, international customers and other institutions.

INTERNATIONAL CUSTOMERS

We ship to customers throughout the world every day, by a variety of shipping carriers and methods. Transit times will vary by geographical location and type of service requested. Packages of 4 lbs. or less can often be shipped economically via United States Postal Air Mail, with a transit time of approximately 1–3 weeks depending on destination. Orders in excess of 4 lbs. are often more economically shipped via Federal Express International (transit time approximately 3–10 days, depending on destination and/or customs delay) or by Surface Mail (transit time of approximately 1–3 months depending on destination). Orders for large items such as Autoclaves and Grow Rooms are shipped via independent Air or Ocean Freight carriers, depending on the total weight and dimensions of the merchandise. Rate quotations for shipping on large equipment orders are provided on a case-by-case basis, and are valid for 30 days from date of origin. All merchandise and shipping charges must be paid prior to shipment. Preferred methods of payment are Visa and Mastercard, Cashier's Check or International Bank Wire (please contact us regarding this method of payment). Sorry, postal money orders from outside the U.S. and Canada will not be accepted. Any duties or taxes applied to a shipment are payable by the recipient. We are happy to provide quotes on shipping costs for international customers via mail, phone, fax or email.

IV. FP'S MYCOMEDICINALS® & DRIED MUSHROOM PRODUCTS

Fungi Perfecti is proud to offer our customers the finest mushroom products available today. Founder Paul Stamets, author of the definitive text ***Growing Gourmet & Medicinal Mushrooms***, has pioneered the cultivation of many unique strains of medicinal fungi. All of our MycoMedicinals® are Certified Organic by the Washington State Organic Food Certification Program. Cultivated under environmentally controlled laboratory conditions, you can be assured that you are getting a bona-fide product of the highest quality.

Mushroom Extracts

Made with Certified Organic grape alcohol, 30 drops of extract is equivalent to 1 gram of mushroom mycelium/fruitbodies. Sold in 1 fluid ounce bottles, except for the **Stamets 7 Mushroom Blend** which is sold in a 2 fluid ounce bottle.

***Agaricus blazei* XAB100** (.1 lb.) ..... **$ 24.95**
(Himematsutake/Royal Sun Agaricus)

***Cordyceps sinensis* XCS100** (.1 lb.) ..... **$ 29.95**
(Caterpillar Fungus/Dong Chong Xia Cao)

***Flammulina velutipes* XFV100** (.1 lb.) ..... **$ 19.95**
(Enokitake/Golden Needle Mushroom)

***Ganoderma lucidum* XGL100** (.1 lb.) ..... **$ 19.95**
(Reishi/Ling Chi)

***Grifola frondosa* XGF100** (.1 lb.) ..... **$ 24.95**
(Maitake/Hen of the Woods)

***Hericium erinaceus* XHE100** (.1 lb.) ..... **$ 19.95**
(Lion's Mane/Yamabushitake)

***Inonotus obliquus* XIO100** (.1 lb.) ..... **$ 19.95**
(Chaga)

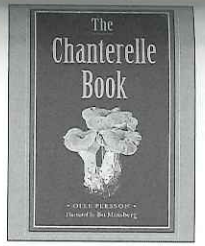
***Lentinula edodes* XLE100** (.1 lb.) ..... **$ 12.95**
(Shiitake/Xiang Gu)

***Trametes versicolor* XTV100** (.1 lb.) ..... **$ 19.95**
(Yun Zhi/Turkey Tail)

***Stamets 7 Mushroom Blend* XSS100** (.2 lb.) ..... **$ 34.95**
(A blend of Royal Sun Agaricus, Cordyceps, Reishi, Maitake, Lion's Mane, Zhu Ling and Yun Zhi)

Special! Buy 4 MycoMedicinal® Mushroom Extracts and receive a 5th bottle FREE!
(Free extract must be of equal or lesser value than lowest-priced extract purchased. All 4 extracts must be purchased at same time.)

Join The Stamets 7 Subscription Service! Fungi Perfecti will automatically send you a bottle of **Stamets 7 Mushroom Blend Extract** every thirty days for one full year, at a special discount price!
SUB7 ..... **$ 299.95**



The Chanterelle Book by Olle Persson, illustrated by Bo Mossberg. Chanterelle mushrooms have been an invaluable staple of European cooking for literally thousands of years, and are more popular than ever in North America. Featuring dozens of full-color illustrations, this book is a fascinating blend of historical information, biology and habitat, and delicious recipes. ***The Chanterelle Book*** will appeal to anyone with an interest in this most celebrated of wild mushrooms. 120 pages, softcover.
MTCB (2 lbs.) ..... **$ 16.95**

Mushrooms to Genus I: Macroscopic Features by Dr. David Largent and Dr. Daniel Stuntz. A superb book for describing and defining the macroscopic features important in mushroom taxonomy, this is one in a series of books by Mad River Press we highly recommend. 86 pages. Black & white illustrations.
MGI (1 lb.) ..... **$ 14.95**

Mushrooms to Genus II: Field Identification of Genera by Dr David Largent and Dr. Harry Thiers. An extremely useful handbook for the identification of over 40 different genera of mushrooms. 32 pages. Softcover.
MGII (.5 lb.) ..... **$ 6.95**

Mushrooms to Genus III: Microscopic Features by Drs. David Largent, David Johnson, and Roy Watling. In our opinion, this books accomplishes a lot. In its 148 pages, the authors have pooled their knowledge to systematically describe and illustrate the microscopic features that are the basis of modern mushroom taxonomy. Softcover.
MGIII (1 lb.) ..... **$ 23.95**

Mushrooms to Genus V: Cultural and Developmental Features by Dr. Roy Watling. A manual for beginning mycology students, this book gives an overview of laboratory techniques for growing mushrooms. Comprehensive in the aspects of morphological development and cultural characteristics specific to various groups of fleshy fungi, this manual is helpful but is not by itself complete enough to be a stand-alone textbook on cultivation. 169 pages with illustrations. Softcover.
MGV (1 lb.) ..... **$ 23.95**

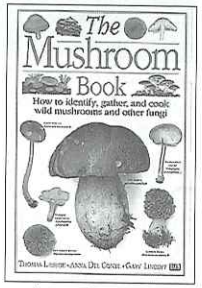
Mushrooms to Genus VI: Modern Genera by Dr. David Largent and Dr. Timothy Baroni. A definitive treatise, numbering 277 pages, this book is significant for its careful attention to the features defining the modern concept of genus. Including a unique approach of viewing taxonomy from the perspective of habitat, this book has extensive taxonomic keys and microscopic descriptions. Highly recommended. Softcover.
MGVI (1 lb.) ..... **$ 23.95**

Easy Mushroom Identification Charts
Catherine Scates is renowned as an educator and photographer. She has created two ingeniously designed overviews that demystify the terms used by mycologists by illustrating the essential features that distinguish mushroom genera. In these two guides, amateurs can quickly understand and match the most important features essential for identifying mushrooms. Combined with a good field guide, the path to accurate mushroom identification is made far easier. **The Easy Guide to Mushroom Descriptions** includes excellent drawings depicting the most important cap shapes, surface features, gill attachments, stem characteristics and veils common to the gilled mushrooms (One $8^{1/2}$ x 14 inch page). **The Easy Key to Common Gilled Mushrooms** covers the major genera as defined by macroscopic features. With this key, the beginner can quickly narrow the mushrooms in question to the most likely genus. (One $8^{1/2}$ x 14 inch page)
MYCOCHART (.1 lb.) ..... **$ 5.00**

A Field Guide to Western Mushrooms by Alexander Smith. Specific to western North America, this field is similar in format to ***The Mushroom Hunter's Field Guide*** but concentrates on the species common to this region. Particular emphasis is placed on edible and poisonous species. Clothbound. 203 color plates in 280 pages. Highly recommended.
MFGW (2 lbs.).....**$ 19.95**

A Field Guide to Southern Mushrooms by Nancy Weber Smith and Alexander Smith. This field guide, a third in a series by the Smiths, describes 241 species. The photographs are extraordinary, depicting species in their natural habitats. Similar in design to its predecessors, this book is specific to the southeastern United States in the broadest geographical sense. (The geographical region from the southern edge of Pennsylvania, along the Ohio River to its junction with the Mississippi, and westward to the eastern edge of the Great Plains. The Gulf of Mexico and the Atlantic Ocean define the remaining boundaries.) 280 pages. Clothbound.
MFGS (2 lbs.).....**$ 19.95**

A Morel Hunter's Companion by Nancy Smith Weber. This book is a tribute to the mighty Morel. In the spring, the pursuit of this most prized group of mushrooms has become a national sport. Nancy Weber Smith delves into the subject with gusto, appealing to the amateur hunter yet possessing a technical depth that captures the interest of all professional mycologists. Also containing a short discussion of the history of Morel cultivation. 208 pages, 72 color plates, 12 diagrams. Softcover.
MMHC (2 lbs.).....**$ 16.95**

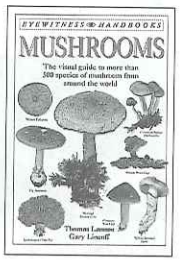


The Mushroom Book by Thomas Lœssøe and Gary Lincoff. This beautifully illustrated book covers more than 450 species, with 2000 photographs and illustrations. Originally designed for the European mushroom hunter, and adapted by Gary Lincoff for North American mushrooms, this book is one of the most aesthetically pleasing identification guides we've seen. Hardcover, 256 pages.
MTMB (3 lbs.).....**$ 29.95**

Toads and Toadstools
By Adrian Morgan. This exquisitely illustrated book is a feast for the eye as well as the intellect. The author has assembled a fascinating mix of mycology, art history, cultural anthropology and pharmacology that will peak the interest of any mycophile. Softcover, 224 pages, $8^{1/2}$ x 11 inches, over 140 illustrations, with full color throughout.
MTAT (3 lbs.).....**$ 24.95**

Ainsworth & Bisby's Dictionary of the Fungi, 8th Edition
The most extensive dictionary of mycological terminology in print, this book has more than 20,000 entries, and includes the most recent revisions in classification, dichotomous keys to families, updated illustrations of key features and molecular-based advancements in taxonomy. An essential reference for anyone with an interest in mycology. 616 pages. Hardbound.
MABD (4 lbs.).....**$ 49.95**

Eyewitness Handbook of Mushrooms by Thomas Lœssøe and Gary Lincoff. A concise guide to mushroom identification, with well-organized descriptions and at-a-glance facts for over 500 mushrooms. Packed with over 2,300 full-color photographs and illustrations. Written and researched by renown mycologists, each entry combines precise descriptions with annotated photographs to highlight the mushrooms chief characteristics and distinguishing features. This book is an indispensible pocket guide to identifying mushrooms worldwide. 304 pages. Softcover.
MEHM (2 lbs.).....**$ 17.95**



Cross-Index of Mushrooms and Targeted Disease Complexes

Species Abbreviations *(For full species names, see key guide below)*

	Ab	Ap	Cs	Fv	Gf	Gl	He	Hm	Io	Le	Pc	Po	Pu	Tv
anti-bacterial			●		●	●				●			●	●
anti-inflammatory						●			●				●	
antioxidant			●			●								●
anti-tumor	●		●	●	●	●	●	●	●	●	●		●	●
anti-viral	●				●	●			●	●	●		●	●
blood pressure			●		●	●				●				
cardio-vascular		●	●			●	●							
cholesterol reducing	●	●	●			●				●		●		
blood sugar moderating	●		●		●	●				●				
immune enhancer	●		●	●	●	●	●		●	●			●	●
kidney tonic			●			●				●				●
liver tonic			●			●			●	●	●		●	●
nerve tonic			●			●	●					●		
sexual potentiator			●							●				
lungs/respiratory		●	●		●	●	●						●	
stress reducing			●		●	●				●	●			

Key Codes to Medicinal Mushroom Species

Ab= *Agaricus blazei*
Ap= *Auricularia polytricha*
Cs= *Cordyceps sinensis*
Fv= *Flammulina velutipes*
Gf= *Grifola frondosa*
Gl= *Ganoderma lucidum*
He= *Hericium erinaceus*
Hm= *Hypsizygus marmoreus*
Io= *Inonotus obliquus*
Le= *Lentinula edodes*
Po= *Pleurotus ostreatus*
Pc= *Poria cocos*
Pu= *Polyporus umbellatus*
Tv= *Trametes versicolor*

These statements have not been evaluated by the Food and Drug Administration. Consult a qualified health care practitioner before taking any substance for medicinal purposes. For more information on medicinal mushrooms, please consult Paul Stamets' ***Mycomedicinals®: an Informational Booklet on Medicinal Mushrooms*** *(see page 73 of this catalog). For a comprehensive bibliography of books, articles and studies on the beneficial properties of mushrooms, point your Web browser to* ***http://www.fungi.com/mycomeds/reftext.html****. Not all species listed above are available from Fungi Perfecti at this time.*

FP's Organic Freeze-Dried Reishi Mushroom Tablets
We've reformulated our popular Reishi Mushroom tablets to three times their original potency! Made with select whole, dried Reishi mushrooms and freeze-dried Reishi mushroom mycelium, both organically grown by the folks at Fungi Perfecti. Each tablet contains 900 mg of Reishi mycelium/fruitbodies. Available in bottles of 30 and 60 tablets.

GLT30 (.5 lb.).....**$ 19.95**
GLT60 (.5 lb.).....**$ 34.95**

FP's Organic Freeze-Dried Cordyceps Capsules
The newest addition to our MycoMedicinal® product line, each vegetable-cellulose capsule contains 615 mg of freeze-dried, organically grown Cordyceps mycelium. Available in bottles of 30 and 60 capsules.

CSC30 (.5 lb.).....**$ 10.95**
CSC60 (.5 lb.).....**$ 19.95**

Stamets Olympic Rainforest Mushroom Tea™
A synergistic blend of four medicinal mushrooms—Reishi ***(Ganoderma lucidum)***, Maitake ***(Grifola frondosa)***, Shiitake ***(Lentinula edodes)***, and Zhu Ling ***(Polyporus umbellatus)***—this naturally soothing tea is refreshing to the body and spirit. One box makes more than two dozen cups. 1 1/2 oz. net weight.

TEA (.5 lb.).....**$ 9.95**
REFILL (.5 lb.).....**$ 7.00**

Stamets Olympic Mushroom Power Tea™
A blend of three mushroom species—***Cordyceps sinensis*** (the Caterpillar Fungus), ***Ganoderma lucidum*** (Reishi) and ***Lentinula edodes*** (Shiitake)—designed specially for the athletically inclined. Enhance your performance! 1 oz. net weight.

TEA2 (.5 lb.).....**$ 14.95**
REFILL2 (.5 lb.).....**$ 11.25**

Organically Grown Dried Shiitake Mushrooms
We sell dried Shiitake mushrooms, organically grown by us, the folks at Fungi Perfecti. They are slow cured via our unique low temperature process.

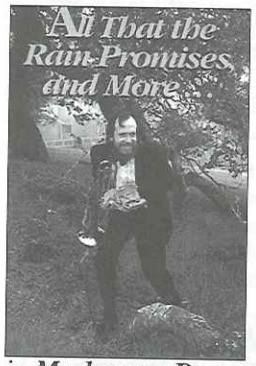
1 lb. of dried Shiitake **DM/LE/LB** (2 lbs.).....**$ 39.00**
1 oz. of dried Shiitake **DM/LE/OZ** (.5 lb.).....**$ 7.95**

Organically Grown Dried Reishi (Ling Chi) Mushrooms
Heralded in Asia for its health stimulating properties, ***Ganoderma lucidum*** is rapidly gaining popularity. 5 grams of Ling Chi is recommended per liter of water for making a rich and soothing tea.

1 oz. of FP's dried Reishi (Ling Chi) **DM/GL/OZ** (.5 lb.).....**$ 14.95**

Field Guides/Identification/Taxonomy

Mushrooms Demystified by David Arora. A comprehensive and delightfully written book by an author whose pre-occupation with fungi borders on the extreme, this field guide is perhaps the most useful on the market. More than 2000 species are covered in 959 pages, with 800 photographs. Softcover. Highly recommended.
MDMA (3 lbs.).....**$ 29.95**



All That The Rain Promises and More:
A Hip Pocket Guide to Western Mushrooms
by David Arora. Depicting 200 mushroom species of Western North America, this is an ideal field guide for the novice with no prior knowledge of mushrooms. Written by the author of ***Mushrooms Demystified***, David Arora has succeeded in communicating the joy of mushrooming in this handy, 264 page book. Softcover
MATRP (1 lb.).....**$ 15.95**

The Audubon Field Guide to North American Mushrooms by Gary Lincoff. Distinguished by its superior photographs (762 of them), this classic field guide covers 703 North American species in its 926 pages. Covering many species not in ***Mushrooms Demystified***, these two books, in combination, are excellent companions for any mushroom hunter. Softcover. Highly recommended.
MASF (2 lbs.).....**$ 18.50**

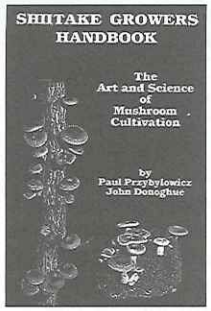
Psilocybin Mushrooms of the World: A Guide to Identification
The most comprehensive field guide to the psilocybin-active species ever published, this field guide illustrates a wide range of species spanning the world. With excellent color photographs, nearly 100 species are fully described, including close relatives and poisonous look-alikes. A book without comparison, this field guide stands alone in its scope and describes many new species not seen in any previous works. Far more than just a field guide, this book will prove useful to mycologists, scholars, physicians, and the passionately curious. 6 x 9 inches, 256 pages. Softcover.
MPMW (2 lbs.).....**$ 24.95**
Special: buy 3 copies of **MPMW** for **$ 64.90** plus **$ 7.00** S&H, or buy **all three** books by Paul Stamets (**MGGM**, **MCUL** & **MPMW**) for **$ 79.95** plus **$ 8.50** S&H

Simon & Schuster's Guide to Mushrooms by Giovanni Pacioni, edited by Gary Lincoff. Originally published in Italy in 1980, this revised edition numbers 511 pages with 400 color photographs & species. (Note: 40 species in this book are not known to exist in North America). This book is recommended for the ardent collector of field guides and is not, by itself, as useful when compared to other books listed here. Softcover.
MSGM (2 lbs.).....**$ 15.00**

Mushrooms of Northeastern North America
by Alan Bessette, Arlene Bessette and David Fischer. This volume covers 1500 species found from eastern Canada south into North Carolina and west into Manitoba, the Dakotas, Nebraska and Kansas. Includes microscopic features, information on fungal anatomy, collection and preservation techniques. With easy-to-follow keys, color photographs and 650 illustrations, this is a valuable guide for beginners and experts alike. Softcover. 784 pages.
MNNA (3 lbs.).....**$ 44.95**

Is Shiitake Farming For You *by Rick Kerrigan. A friendly, realistic, succinct examination of Shiitake cultivation. Rick Kerrigan discusses standard methods of inoculating logs, and delves into formulas for determining the cost effectiveness of Shiitake farming. 23 pages. Softcover.*

MSH (.5 lb.) ..... **$ 5.00**



Shiitake Grower's Handbook: The Art and Science of Mushroom Cultivation by Paul Przybylowicz and John Donoghue. A book specific to the needs of aspiring Shiitake growers. The authors have done a fine job of outlining the steps needed for selecting, inoculating, curing, and cropping logs. Each step is referenced so that the devotee can pursue additional data via the extensive bibliography. (Please note that this book does not address sterile culture or spawn generation techniques, assuming the growers buy spawn.) Now includes a chapter on the production and fruiting of Shiitake sawdust blocks. We welcome this contribution to mushroom culture. 217 pages. Softcover.

MSGH (1 lb.) ..... **$ 24.95**

Growing Shiitake Commercially
This 72 page book is written by an experienced log cultivator and Shiitake expert who has travelled extensively throughout Japan. Featured in this book are techniques for inoculating logs with plug, sawdust and/or comb spawn. Of particular interest are the methods used in Japan for large scale log cultivation. Softcover.

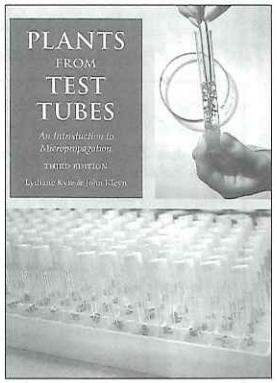
MGSC (1 lb.) ..... **$ 13.50**

Growing Shiitake Mushrooms in a Continental Climate by M.E. Kozak and J. Krawcyzk. Two Shiitake growers have pooled their experiences in this collaborative work. Commercial Shiitake growers have praised this book for its practical, direct approach. From their hands-on experiences, the authors present insightful short-cuts to make material handling of logs, their inoculation, incubation, and cropping a straightforward endeavor. This illustrated book is easy to read but will be beneficial to both beginners and professionals. 45 pages long. Softcover. Appropriately printed on recycled paper.

MGSM (.5 lb.) ..... **$ 14.00**

Plants From Test Tubes by Lydiane Kyte. Available again after several years out of print! A comprehensive manual on plant tissue culture, this book describes in depth the media formulations, cloning techniques and methods for expanding a single plant into thousands. 34 species of plants are detailed. 240 pages. Hardcover.

MPFT (3 lbs.) ..... **$ 29.95**



Introduction to *In Vitro* Propagation by D F. Wetherell. Addressing the basic techniques of plant tissue culture, this manual addresses both those working in a home-based laboratory as well as the commercial or research laboratory. 87 pages. Softcover.

MIIV (.5 lb.) ..... **$ 12.95**

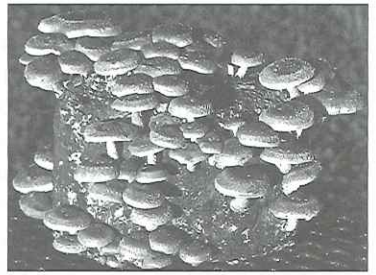
Visit us on the Web at www.fungi.com for the most up-to-date mushroom information, products and pricing!

We've reformulated our popular Reishi Mushroom tablets to *three times* their original potency! Made

V. PRE-INOCULATED MUSHROOM PATCHES

Fungi Perfecti offers a variety of mushroom patches, in kit form, for indoor cultivation. Each kit comes with an illustrated instruction booklet and is guaranteed to produce. After these indoor kits stop producing, they can be used as spawn to inoculate outdoor garden composts and/or logs. We hope you come to love mushrooms and mushroom growing as much as we do.

The Shiitake Mushroom Patch™



A mushroom treasured by many, our Shiitake Patch is composed of a unique blend of sterilized, enriched sawdust fully colonized with a select Chinese strain. Esteemed for both its health stimulating properties and its culinary value, our new Shiitake kit out-produces by far that of any known competitor. Shiitake mushrooms can be harvested at two week intervals up to 16 weeks. A 50–80° F environment is ideal.

The Shiitake Mushroom Patch™ *(Lentinula edodes)*

K100 (7 lbs.) ..... **$ 24.00**

The Pearl Oyster Mushroom Patch™

Bouquets of Pearl Oyster Mushrooms will flourish within 2 weeks of arrival. A 55–75° F environment is needed. This kit produces a surprisingly abundant crop of tasty mushrooms. We recommend inoculating your garden compost pile with this kit after use. Often gardeners can enjoy continued harvests of Oyster mushrooms outdoors in the following months.

The Pearl Oyster Mushroom Patch™*(Pleurotus ostreatus)*

K200 (8 lbs.) ..... **$ 19.00**

The Pink Oyster Mushroom Patch™

A tropical species, the Pink Oyster mushroom is also called the Flamingo Oyster. This strikingly beautiful mushroom requires sustained temperatures above 70° F for best results.

The Pink Oyster Mushroom Patch™
(Pleurotus djamor)

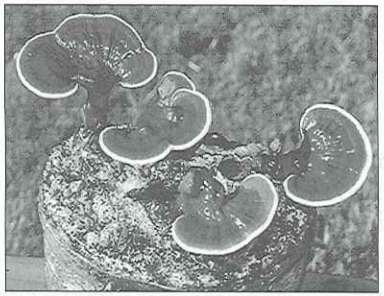
K210 (8 lbs.) ..... **$ 19.00**

Buy 4 of FP's Indoor or Outdoor Mushroom Patches and get a 5th Patch of equal or lesser value FREE!

The "Espresso Oyster" Mushroom Patch™

*The wave of espresso consumption sweeping the country provides a ready-made base for growing the gourmet Oyster Mushroom (**Pleurotus ostreatus**).* Since the steaming of coffee grounds essentially pasteurizes them, they are ideal for growing this delectable mushroom. Percolated coffee grounds work equally well. Just ask your local coffee shop to save their grounds, or save your own in a 2–5 gallon bucket. Mix our pure Oyster mushroom spawn into the moist coffee grounds by hand, cover with a plate or perforated plastic bag, and mushrooms will spring to life in two to three weeks. A fascinating project for people of all ages. Kit comes complete with 1 gallon of Pearl Oyster Sawdust Spawn and detailed instructions.

The "Espresso Oyster" Mushroom Patch™ *(Pleurotus ostreatus)*
K290 (7 lbs.) ..... **$ 19.00**



The Reishi/Ling Chi Mushroom Patch™
Ganoderma lucidum, known as Reishi by the Japanese and Ling Chi by the Chinese, has long been sought after for its beneficial properties. Ling Chi is perhaps the most well renowned of all the medicinal fungi, represented in Asian art for thousands of years. A 70–80° F environment is ideal. Reputed to have many health stimulating properties, Western studies are increasingly authenticating what Eastern cultures have known for thousands of years: that this mushroom stimulates the body's immune system. Once grown this mushroom can be dried, broken into pieces and steeped in simple teas. Its flavor is strong, distinctive, and pleasant to most people.

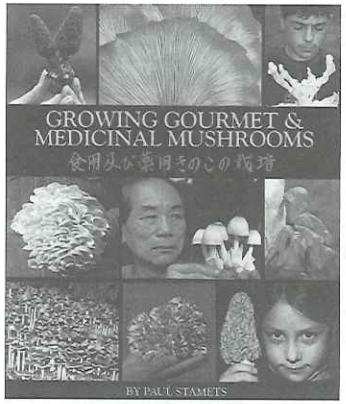
The Ling Chi/Reishi Mushroom Patch™ *(Ganoderma lucidum)*
K260 (7 lbs.) ..... **$ 24.00**

The Lion's Mane Mushroom Patch™
An extraordinary mushroom, the Lion's Mane ***(Hericium erinaceus)*** produces cascading, icicle-like clusters that enlarge to the size of baseballs. A 65–75° F environment is ideal. Also known as Bear's Head or Monkey's Head, this mushroom is quickly gaining in popularity. Edible and choice, this mushroom imparts a "lobster" flavor when cooked with butter and onions.

The Lion's Mane Mushroom Patch™
(Hericium erinaceus)
K255 (7 lbs.) ..... **$ 24.00**

XVII. BOOKS

Books on Mushroom Cultivation



Growing Gourmet and Medicinal Mushrooms
食用及び薬用きのこの栽培

A revolutionary treatise for utilizing mushrooms through the 21st Century

• 586 pages • 59 color plates • 402 photographs and diagrams • Mycological Landscaping • • Mushroom Permaculture • Using Catastrophia as an Ally • Precise growth parameters for 25 gourmet and medicinal mushroom species • • Troubleshooting Guide • Growing Room & Lab designs • Recipes from the experts •

and much more.....

Now in its Second Edition! More photographs, new references, mycological resources on the Internet....the best just got better!

"***Growing Gourmet and Medicinal Mushrooms*** is terrific. It solidifies Paul Stamets' reputation as a mycological trailblazer. It is practical, comprehensive as well as inspirational—an absolute must for anyone who wants to grow their own mushrooms...."
– David Arora, author of ***Mushrooms Demystified*** and ***All that the Rain Promises and More***

Growing Gourmet & Medicinal Mushrooms (Softcover)
MGGM (3 lbs.) ..... **$ 39.95**

The Mushroom Cultivator, by Paul Stamets and J.S. Chilton.
This book details the cultivation of 16 edible and psychoactive species and control measures for 40 genera of contaminants. Numbering 415 pages, with 249 black and white photographs, diagrams and scanning electron micrographs. Highly reviewed and used throughout the world as a textbook. Softcover. As Dr. Alexander Smith once stated: "This book should be in every mycological laboratory."
The Mushroom Cultivator **MCUL** (3 lbs.) ..... **$ 29.95**

Growing Gourmet & Medicinal Mushrooms is designed to be used as a companion guide to **The Mushroom Cultivator.**

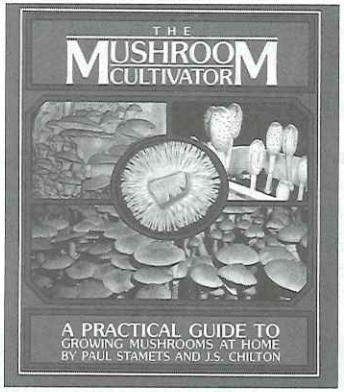
What does ***The Mushroom Cultivator*** have that ***Growing Gourmet & Medicinal Mushrooms*** does not?

- formulas for producing high quality compost
- control measures and descriptions for 40 genera of contaminants including bacteria, molds and insects
- descriptions for the cultivation of Button Mushrooms and four *Psilocybe* species

These two volumes, in tandem, are encyclopedic in scope and are a must for the bemushroomed cultivator.

SPECIAL: Buy both books for only $64.90 (+$7.00 S&H)

Shipping charges higher outside the U.S. Call for details.



XVI. MUSHROOM WEAR

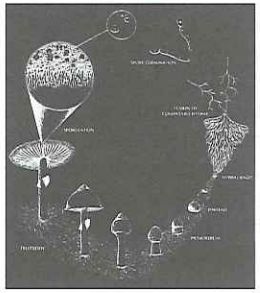
Fungi Perfecti's Icon T-Shirt
Fungi Perfecti's trademarked Northwest mushroom icon on a 100% cotton T shirt. Color: blue ink on black shirt.
FPS101 (1 lb.) .....small **$ 14.95**
FPM102 (1 lb.) .....medium **$ 14.95**
FPL103 (1 lb.) .....large **$ 16.95**
FPL104 (1 lb.) .....extra large **$ 16.95**

Fungi Perfecti's Icon Sweatshirt
Fungi Perfecti's distinctive mushroom icon is also available on the back of a deluxe 9 oz. heavyweight hooded 50/50 zippered sweatshirt. The front features our logo, a white lightning bolt and our Home Page address (www.fungi.com) emblazoned over the right breast. Available in size extra large only. Color: blue ink (except for lightning bolt) on black shirt.
FPX301 (3 lbs.).....**$ 34.95**

FP's Cave Art Mushroom Shirt
This 100% cotton T-shirt features Tassili cave art from Northern Algeria, possibly the first self-portrait of a paleolithic mycologist! A distinctive gift for those with a passion for mushrooms or anyone who appreciates timeless mushroom images. Color: dark gray ink on "natural tone" shirt (sort of light gray with other darker bits mixed in).
FPM201 (1 lb.).....medium **$ 14.95**
FPL202 (1 lb.).....large **$ 16.95**
FPX203 (1 lb.).....extra large **$ 16.95**

Vintage Mushroom Print T-Shirt
This cream-colored, 100% cotton T-shirt features a unique, turn-of-the-century color print of many commonly known mushroom species such as ***Agaricus campestris***, ***Amanita muscaria*** and ***Boletus edulis***. A perfect gift for the nature lover or mushroom connoisseur.
FPM401 (1 lb.).....medium **$ 16.95**
FPL402 (1 lb.).....large **$ 16.95**
FPX403 (1 lb.).....extra large **$ 17.95**

The Mushroom Life Cycle T-Shirt
A detailed diagram of the mushroom life cycle from Paul Stamets' book ***The Mushroom Cultivator***, on a 100% cotton T-shirt. Color: White ink on black shirt.



TS101 (1 lb.).....small **$ 12.95**
TS102 (1 lb.).....medium **$ 14.95**
TS103 (1 lb.).....large **$ 14.95**
TS104 (1 lb.).....extra large **$ 16.95**

The Mushroom Life Cycle Sweatshirt
The mushroom life cycle on a 9 oz. cotton sweatshirt. Color: white ink on black shirt.
SS100 (2 lbs.) .....large **$ 24.95**
SS110 (2 lbs.) .....extra large **$ 28.95**

The Enokitake Mushroom Patch™
A veritable forest of small capped, long stemmed Enokitake mushrooms—often too numerous to count—will emerge from this mushroom kit. Long favored by the Japanese and known by North Americans as The Winter Mushroom, this species is delightful to grow and eat. A 40–60° F environment is recommended. (To activate, simply place it in your refrigerator.) Like the Pearl Oyster Mushroom Patch, freezing does not harm this mushroom.

The Enokitake Mushroom Patch™ ***(Flammulina velutipes)***
K250 (5 lbs.).....**$ 20.00**

The Nameko Mushroom Patch™
The Nameko Mushroom ***(Pholiota nameko)*** is Japan's second most popular cultivated mushroom (Shiitake is the most popular). Frankly folks, this mushroom is one of the most delicious we have ever tasted, with a strong flavor reminiscent of cashews. A 50–65° F environment is ideal. Typically, one to two crops of mushrooms are produced, with a total yield of 1–2 pounds.
The Nameko Mushroom Patch™ ***(Pholiota nameko)***
K150 (5 lbs.).....**$ 20.00**

Bonsai Reishi Mushroom Mycosphere™
A mycosphere hosting a unique antler-forming strain of Reishi ***(Ganoderma lucidum)***, this clear, reusable dome is virtually maintenance-free. A 70–80° F environment is ideal. This slow growing fungus, known in Asia as the Mushroom of Immortality, progresses through mesmerizing transformations as lacquered-looking antlers elongate over several months. Once grown the mushrooms can be harvested as art or for making into woodsy tea. ("Cool!" says Stamets.)

The Bonsai Mushroom Mycosphere™ ***(Ganoderma lucidum)***
KBMM (4 lbs.).....**$ 20.00**

Fungi Perfecti is Certified Organic by the Washington State Department of Agriculture Organic Foods Certification Program

ORDER LINE: (800) 780-9126 • PHONE: (360) 426-9292
FAX: (360) 426-9377 • email: mycomedia@aol.com

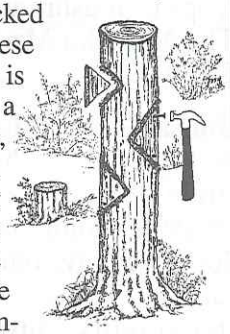
The Children's Mushroom Garden™

Many children love mushrooms are fascinated by their growth. So we are proud to offer a uniquely delightful kit: The Children's Mushroom Garden. Housed in a reusable, clear domed cylinder, your child can watch mushrooms burst to life before their eyes. Each kit comes with an instruction booklet and an interactive watering calendar. (Note: even if your child does not water this kit, it will still produce.) A 40–60° F environment is ideal. As with all of our mushroom kits, this one is also fully guaranteed. And, of course, the mushrooms are edible and choice!

The Children's Mushroom Garden™
(Enokitake: *Flammulina velutipes*)
KCMG (4 lbs.) ..... **$ 19.00**

Maximizing Your "Mycelial Mileage"

When they are through producing indoors, many of our indoor Mushroom Patches can be brought "back to life" through outdoor cultivation. When your Shiitake, Reishi or Lion's Mane Mushroom Patch has run itself out indoors, the material that makes up the Patch (called "spawn") can be broken up and used to inoculate hardwood logs. The spawn can be packed into the cut face of firewood logs. Loggers call these "rounds". Another "round" of slightly smaller diameter is sandwiched on top. As each round is added, it resembles a telescoping "tootsie-roll". These are best located outside, in a shady and naturally moist location. Placing them in the garden, on the north side of corn, grape, pole beans, or similar towering shade-providing plants will preserve moisture. After about two months, heavily watering the stacked rounds will stimulate mushroom production.We recommend using a hardwood—ideally oak, alder, cottonwood (poplar), aspen, elm, beech, walnut, or similar woods. Avoid fruit trees—they are too dense & tough. You can also inoculate logs using the "wedge technique", in which wedges are cut from the log and the crevices packed with mushroom spawn. The wedges are then replaced in the log and secured with nails, screws or straps. Logs can be placed either horizontally on pallets or cinderblocks, or placed vertically with one end buried in the ground to help draw moisture from the soil up into the log. With some consideration, exotic mycological landscapes can be created using artfully arranged logs! For more intensive information on outdoor cultivation, please consult our books on mushroom cultivation, on pages 67 & 68 of this catalog.

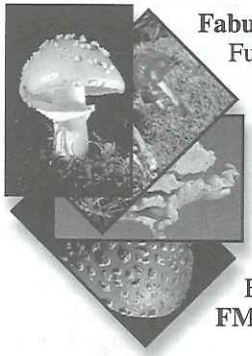


Visit us on the Web at www.fungi.com for the most up-to-date mushroom information, products and pricing!

"Xochi Speaks" Poster

This amazing 24 x 36" full color poster is a truly unique find. Xochipilli (the Aztec god of flowers, representative of the use of sacred plants, particularly mushrooms) gazes upwards towards an array of 12 molecules of psychoactive compounds depicted as three-dimensional models. Each molecule is accompanied by information regarding classification, duration, effects and more. An included 16-page guide provides even more detailed information, including a suggested reading list. Educational and beautiful to the eye, "Xochi Speaks" is a work of art that anyone will enjoy.

MPOS4 (2 lbs.) ..... **$ 24.95**



Fabulous Mushroom Postcards

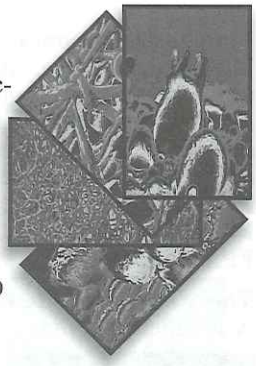
Fungi Perfecti is offering a set of four postcards featuring some of Paul Stamets' best images of naturally occurring wild mushrooms. In this first set, four mushrooms are depicted: Chicken- of-the-Woods ***(Laetiporus sulphureus)*** from the Olympic Peninsula, two colorful variants of Fly-Agaric ***(Amanita muscaria)***, and a potent Psilocybe ***(Psilocybe baeocystis)*** from Washington State. 4 x 6 inch glossy, high-quality color reproductions, printed on card stock paper. Beautiful and unique! Sold in sets of four.

FMPC (.25 lb.)..... **$ 2.49**

New Micrograph Postcards!

Fungi Perfecti's newest postcard set features four scanning electron micrographs of the mushroom life cycle. These 4 x 6", computer color-enhanced images depict mushroom spores and mycelium in varying stages of development, at magnifications from 500X to 5000X. Each postcard bears a descriptive caption on the back. FP's Micrograph Postcards are educational as well as visually stunning! Sold only as a set.

FMPC2 (.25 lb.)..... **$ 2.49**



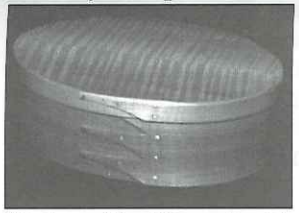
MesoAmerican Mushroom Stones

MesoAmerican Mushroom Stones were first made during the pre-Classic period by the Mayans, circa 500 B.C. They are thought to have had spiritual significance—protecting their owners from harm, denoting property boundaries, and invoking precious rain. We have reproduced some of the finer mushroom stones and are offering our first replicate for sale. Custom made by us here at FP out of durable plaster-resin matrix and treated with a granite-like finish. Stands 13 inches tall. Please call for availability.

MMS100 (20 lbs.) ..... **$ 99.95**

XV. MUSHROOM GIFTS & ART

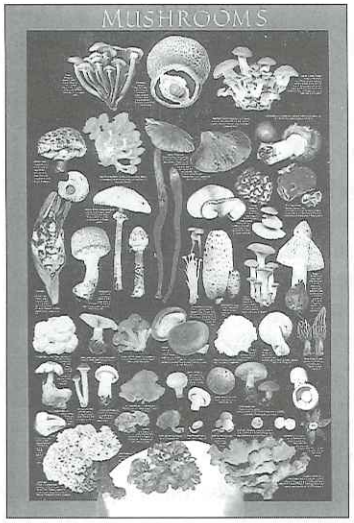
The MycoMaple Shaker Box



Everyone appreciates a finely crafted box and this one is uniquely attractive to the mushroom lover. These luxurious bent-wood boxes are made from maple that was inoculated with the mycelium of Reishi *(Ganoderma lucidum)*. The mushroom mycelium has marbled the wood with variegated veins, a feature long sought-after by woodworkers. (Each box features a unique pattern, and will differ from the box shown at left). An exquisite gift for yourself or a loved one. High quality. Measuring 7 x 10 x 3 7/8 inches.
MMSB (4 lbs.) ..... **$ 39.95**

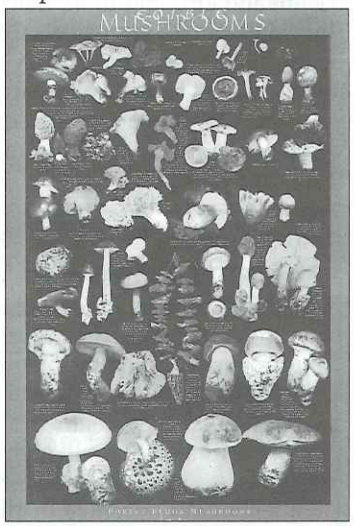
Fungi Perfecti's Icon Pendant

For the first time we are offering a limited quantity of finely crafted pendants in silver or 14K gold, featuring Fungi Perfecti's northwest coast styled logo. An heirloom surpassing time and culture, a perfect gift for the passionately bemushroomed.
Silver **LOGOS** (.5 lb.)..... **$ 59.95**
Gold **LOGOG** (.5 lb.)..... **$ 225.00**



Mushroom Posters

We're proud to present these beautiful full-color Mushroom Posters, created by David Arora, world renowned mycologist and author of ***Mushrooms Demystified*** and ***All That the Rain Promises and More***. These are high-quality reproductions of photographs by some of the world's best mushroom photographers, not simple illustrations. **Poster One** depicts many of the cultivated edible mushrooms, while **Poster Two** depicts many of the wild forest floor mushrooms of the world. Each of the mushrooms portrayed is accompanied by descriptive text, outlining Latin name, common name and other useful information. Posters measure 24" x 36". Available individually or as a set. An ideal gift for the mycophile on your list!



Cultivated Mushrooms **MPOS1** (2 lbs.)..... **$ 14.95**
Forest Floor Mushrooms **MPOS2** (2 lbs.)..... **$ 14.95**
Both Posters as a Set **MPOS3** (3 lbs.)..... **$ 24.95**

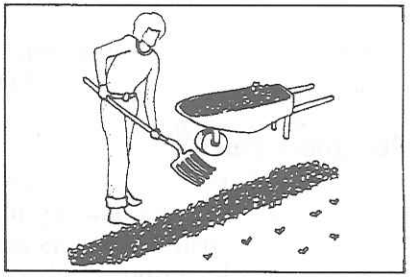
Visit us on the Web at www.fungi.com for the most up-to-date mushroom information, products and pricing!

VI. OUTDOOR MUSHROOM SPAWN & ACCESSORIES

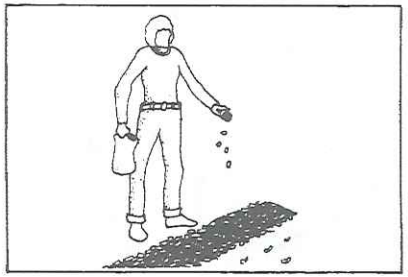
Backyard Mushroom Patches (Sawdust/Woodchip Spawn)

Our outdoor mushroom patches are for beginners, gardeners, and all those who want a mushroom patch close to their home. FP provides a wide selection of mushroom spawn for planting outdoors. With our outdoor spawn, a mushroom patch can be established in the privacy of your backyard or garden. Taking only minutes to prepare, mushroom lovers can enjoy harvests for months and in some cases for years to come. Complete instructions included.

Example of one method for mound culture.

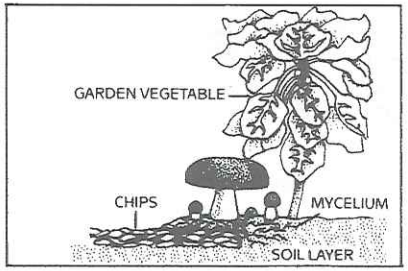


Layer of recommended moist mulch placed along edge of garden bed.



Sprinkling spawn on top of mulch layer.

Adding more moist mulch over the spawn layer.



Cross section of garden bed showing mycelium spread and mushroom growth.

Reprinted from ***Growing Gourmet and Medicinal Mushrooms***,

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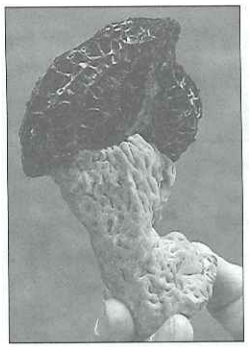
FAX: (360) 426-9377 • email: mycomedia@aol.com

The Garden Giant Mushroom Patch™

Also known as the King Stropharia. Once inoculated into a bed of hardwood chips and sawdust, the mycological gardener leaves it undisturbed for 6–12 months. After this spawn running period, giant burgundy-colored mushrooms will emerge. The Garden Giant is capable of producing continuous flushes of mushrooms through an amazingly broad temperature window; from 40° to 90° F. Flushes span 6 months to 2 years depending on care, location, and mass of colonized material. Noted for their monolithic size, our largest specimens have weighed nearly 5 lbs. apiece! They are delicious when sliced, barbequed and basted with teriyaki on a grill. (Warning: The Garden Giant has been known to stop cars, wreaking pandemonium through the suburbs of America.) Freezing is not harmful to this kit. Inoculations should occur March through October.

The Garden Giant Mushroom Patch™ ***(Stropharia rugoso-annulata)***
K270 (5 lbs.).....**$ 24.00**

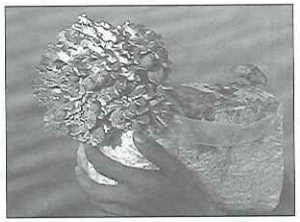


The Giant Morel Mushroom Patch™

Cloned from some of the largest Morels ever found, we provide pure culture spawn of this popular Spring mushroom. A mushroom bed is prepared outdoors and with some luck, time and favorable spring weather, a secret Morel patch can be protected within the privacy of your backyard. Inoculations should occur between June and January (Note: this Patch may take as long as two years to produce its first crop).

The Giant Morel Mushroom Patch™
(Morchella angusticeps)
K275 (5 lbs.).....**$ 29.95**

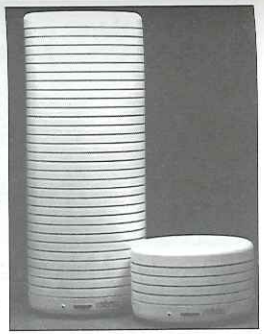
The Maitake (Hen-of-the-Woods) Mushroom Patch™



This succulent, edible and choice mushroom may prove to be the medicinal mushroom of the 90's. This kit can be grown in a 3–5 gallon container indoors or out, provided that temperatures hover within the 55–70° F range. Simply unwrap, surround with sawdust and water once or twice a day. Clusters of Maitake mushrooms will spring forth in 2–3 weeks. Once your first flush has been harvested, the Maitake Mushroom Patch™ should be transferred to an outdoor bed where subsequent flushes can occur in 6–12 months.

The Maitake Mushroom Patch™ ***(Grifola frondosa)***
K285 (8 lbs.).....**$ 29.95**

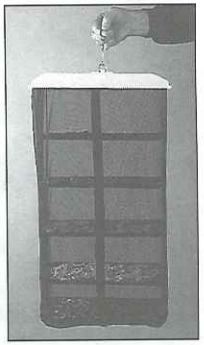
XIV. MUSHROOM PRESERVATION



Expandable Food Dehydrator
A remarkable food dehydrator, in fact, the best we've used. Each tray has one square foot of surface area. A single base unit can accommodate up to 30 trays from one thermostatically controlled, solid state heater. Mushrooms and other foods dry fast, evenly, and without getting that burnt-to-the-crisp look. Nutrition, flavor and texture preserved, economically. A fine unit for the gardener and mushroomer.

Garden Master Dehydrator 1000
Includes 4 trays, expandable to 30 trays.
GMD1000 (15 lbs.).....**$ 159.00**
Additional trays, 2 per package.
GMD1002 (3 lbs.).....**$ 24.95**

Drierite
A highly absorbent dessicant, excellent for storage of dried mushrooms. Drierite absorbs dozens of times its mass in water. Also useful for keeping culture media and its components dry. Simply bake in the oven and reuse. 6" mesh.
DRW104 (7 lbs.).....**$ 34.95**
Indicator Blue Drierite is blue in color when dry, reddish when saturated.
DRB204 (7 lbs.).....**$ 44.95**



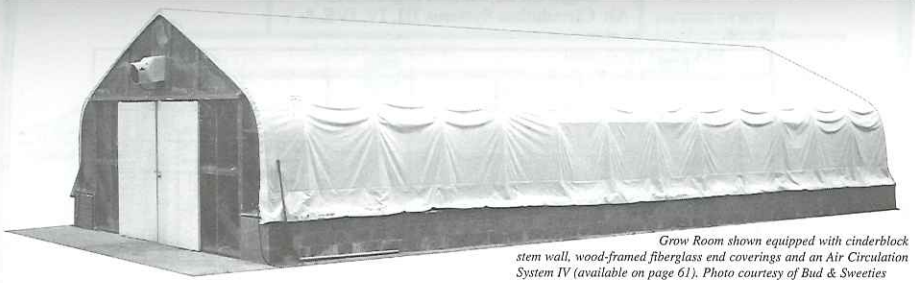
The "Air-Powered" Food Dehydrator
This five-tray, non-electric food dehydrator is ingenious in its design and efficient in its function. Fine mesh screen walls and floor prevent the intrusion of dust and insects. Cleanable plastic trays can be used to dry fruits and vegetables, preserve meats, make fruit leather or grow gourmet sprouts right in your kitchen. The entire unit disassembles for easy cleaning. A wholesome, handy addition to your kitchen!
PAN100 (8 lbs.).....**$ 34.95**

NUTRITIONAL VALUE OF MUSHROOMS

Many myths have been spread about mushrooms. One of the most inaccurate is that mushrooms have no nutritional value. To properly consider them for their nutritional benefits, they must be viewed from a dried weight perspective. And mushrooms give you maximum nutritional benefit only upon cooking.

Mushrooms are relatively high in protein, averaging about 20% of their dried mass. Further they contribute a wide range of essential amino acids. Low in fat (between .3 and 2%) and high in fiber, mushrooms also provide several groups of vitamins, particularly thiamine, riboflavin, niacin, biotin, and ascorbic acid. Now that research is unveiling that many of these species also stimulate the human immune systems, mushrooms are clearly becoming the gourmet health food of the 1990's and beyond.

XIII. MUSHROOM GROW ROOMS



Grow Room shown equipped with cinderblock stem wall, wood-framed fiberglass end coverings and an Air Circulation System IV (available on page 61). Photo courtesy of Bud & Sweeties

22 x 50 Foot Mushroom Grow Room

Our newest Mushroom Grow Room design offers the best combination of durability, utility and price for the professional mushroom cultivator. Measurements: 22' wide x 50' long, 12' center height, 8' 10" sidewall height. Vertical support ribs spaced every 4 feet. Structure is made from 2 3/8", 12 gauge structural steel. The frame can be anchored directly to the ground or to a concrete slab (please specify when ordering; a concrete slab with a two-foot stem wall of concrete or cinder blocks is highly recommended and is included in the calculation of the dimensions of this Grow Room. Center height without stem wall: 10'). Includes cover and end covering made from 20-year, 18 ounce, UV-treated ripstop vinyl fabric. Cover is opaque, with a 6' wide translucent panel running the center length of the building. Available in five colors: chocolate brown, forest green, tan, white, slate gray and blue (white is recommended for most climates). Please note that this structure does not come with end coverings. Solid endwalls of wood or similar rigid material must be added by the customer in order to securely mount air circulation equipment, electrical/water hookups, switches, etc.. Complete instructions for assembly included. Shipping charges evaluated on a order-by-order basis. Please contact us for quotes on shipping.

GROWROOM† (1,250 lbs.).....**$ 3,400.00**

This structure is also available with end coverings with 3-way zippered entryways. This configuration is suggested for use as a dormancy/recapture facility as described in ***Growing Gourmet and Medicinal Mushrooms***.

RECAPTURE† (1,350 lbs.).....**$ 3,700.00**

Fungi Perfecti recommends that any grow room have a cement floor for drainage and control of contaminants.Customers are responsible for assuring that their growing rooms conform to local building codes. In many localities, agricultural structures of 1,000 square feet or less are building code exempt. Please inquire with your local Building Department. If you require a Grow Room configuration different from that outlined here, please contact us.

The Shaggy Mane Mushroom Patch™

Shaggy Manes (***Coprinus comatus***) are delicious and widespread throughout the northern hemisphere. This patch can be inoculated any time from Spring through Fall. Shaggy Manes can be grown in a wide variety of composted materials, and favor rich soils, especially those of newly created lawns. Simply mix the mushroom spawn provided into a soil bed or compost pile, follow the watering instructions, and wait. Fruitings occur primarily in the Fall.

The Shaggy Mane Mushroom Patch™ *(Coprinus comatus)*

SPCC (5 lbs.) .....**$ 20.00**

Habitat Components for Outdoor Cultivation

MycoMedia™ Select Hardwood Chips

These fresh alder chips, roughly 7/8 inches in length, are ideal for the bed culture of many mushroom species, including the **Garden Giant™** ***(Stropharia rugoso-annulata)*** and all the wood-loving species described in ***Growing Gourmet & Medicinal Mushrooms*** by Paul Stamets. We recommend composing a habitat wherein these chips represent 25% of the total mass. Hardwood sawdust should comprise the remainder (but not cedar, redwood, pines, eucalyptus or other aromatic woods).

MM10, approx. 10 lbs. wood chips per box (12 lbs.).....**$ 12.95**

Select Hardwood Sawdust

This alder sawdust is an excellent medium for the outdoor cultivation of many saprophytic mushrooms.

MM30, approx. 10 lbs. sawdust per box (12 lbs.).....**$ 7.50**

Morel Mushroom Media Matrix™

We compose a complex mixture of the ingredients stimulatory to Morel growth. Containing peat moss, calcium sulfate, sawdust, and other ingredients, each bag should amply provide the necessary base for growing morels when inoculated with our **Giant Morel Mushroom Patch™** on page 17 (Note: charcoal-encrusted, burnt wood will need to be added to the Matrix). Once inoculated, this mix must be located outside and have contact with garden soils for the best results.

MM20, approx. 10 lbs. material per bag (12 lbs.).....**$ 16.95**

Granular Gypsum

This superior pellet-size gypsum is ideal for loosening composite substrates and is essential for the cultivation of Morels. This grade of gypsum is 90% pure calcium sulfate and has less than 1% magnesium. Essentially a pH neutral salt, calcium sulfate has a wide number of applications throughout all phases of mushroom cultivation. Sold in 40 lb. bags.

GG40† (42 lbs.) .....**$ 16.95**

Mushrooms for Log & Stump Cultivation (Plug Spawn)

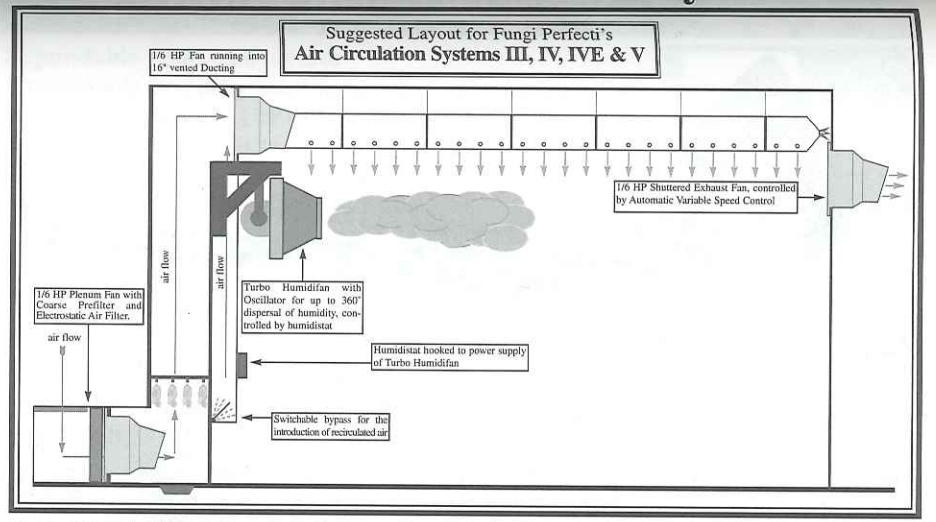
Fungi Perfecti's Plug Spawn consists of mushroom mycelium growing on small, spiral-grooved birch dowels. By using the dowels to **inoculate** cut hardwood logs or stumps, mushroom mycelium can be encouraged to grow throughout or **colonize** the wood. Once the wood is fully colonized—typically 9–12 months—mushrooms will spring forth from cracks or channels in the wood. Each order of Plug Spawn comes with our user-friendly 10 page instruction booklet.

Logs should be cut to lengths of 3–4 feet, and are best if they do not exceed 14 inches in diameter. Use a 5/16" drill bit in a high-speed drill to drill 2-inch deep holes, evenly spaced along the logs. Stumps should be inoculated along the circumference of their face, in the border between the bark and the heartwood. Insert 1 plug per hole and whack it in with a hammer. A 3–4 foot log can take 50 or more plugs, while stumps usually hold 30–50 plugs Holes can be sealed with cheese wax or beeswax to protect the mycelium while it is growing; although this step is helpful, it is not absolutely necessary.

Our Plug Spawn prefers to grow on hardwoods, with the exception of the **Phoenix Oyster** and the **Conifer Coral Mushroom**, which grow well on firs. Most species can be grown on either logs or stumps. Non-aromatic hardwoods such as oak, poplar (cottonwood), elm, maple and similar woods are very good candidates for log cultivation. Alder is a good wood for the cultivation of Oyster and Shiitake mushrooms, but must be kept above ground because it will decompose quickly in contact with the soil. (We do **not** recommend using aromatic woods such as cedar or eucalyptus.) Thick-barked woods are preferable over "paper-bark" woods such as birch, and any log that is shedding its bark should not be used. Logs should be cut one to three months in advance of plugging. Cutting your logs in the late Winter or early Spring helps to insure that they have a high sugar content. Freshly-cut logs should not be immediately inoculated; trees naturally produce anti-fungal compounds, which degrade in two to three weeks from cutting. Aged deadwood is also not recommended for plugging, as it has a poor nutrient base for supporting mushroom growth. Logs or stumps with fine cracks (called "checks") running through them are more quickly colonized with mushroom mycelium than those without.

We guarantee our Plug Spawn to be viable. However, due to the many and various contributing factors found in Nature—among them climate, species, sugar and moisture content of wood quality of care and just plain old chance—we cannot accurately predict the amount of mushrooms your Plug Spawn will produce.

FP's Advanced Air Circulation Systems



Fungi Perfecti has developed these state-of-the-art convection/humidification systems to provide the perfect environment for the large-scale cultivation of gourmet and medicinal mushrooms. Outside air is screened of contaminants by an **Electrostatic Air Filter** and drawn through the room by a powerful **1/6 HP Blower**, through **16 inch Vented Ducting** for thorough, even distribution of air throughout the grow room. A **Shuttered Exhaust Fan** facilitates entrainment. Humidity is maintained by a **Turbo Humidifan** mounted on an **Oscillator** for up to 360° dispersal of atomized water droplets. A **Humidistat** controls the operation of the Humidifan. The **Enhanced Air Systems** are suitable for growrooms ranging from 5,000 up to 32,000 cubic feet in size.

The Enhanced Air System III Includes:

1) Three 1/6 HP, 1538 CFM Blowers
2) Two high-amperage Manual Speed Controls
3) A 22 x 21 inch Electrostatic Air Filter
4) A 1/6 HP Turbo Humidifan and an Oscillator
5) An HC201 Humidistat
6) 60 feet of 16 inch Vented Ducting
7) A Polythermal Professional Hygrometer & Sling Psychrometer
8) A Quick-Set "Max-Min" Thermometer

Purchased separately, these items would cost you nearly **$ 3000.00**. We are offering this system at a special price.

ACS003† (135 lbs.) ..... **$ 2649.00**

The Enhanced Air System IV contains all the items of the **Air System III**, but replaces the 1/6 HP Turbo Humidifan with a 1/2 HP unit, and includes a **Thermostatically Controlled Automatic Motor Speed Control** for more enhanced control of the growroom environment.

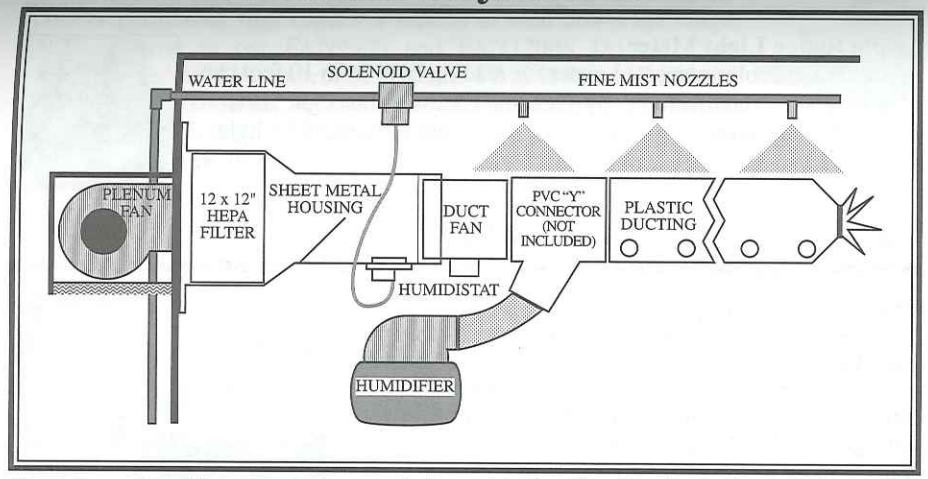
ACS004† (160 lbs.) ..... **$ 2999.00**

ACS004E† (175 lbs.) for 230V/50Hz applications ..... **$ 3149.00**

The Enhanced Air System V contains all the items of the **Air System IV**, but replaces the 1/2 HP Turbo Humidifan with a 1 HP unit.

ACS005† (170 lbs.) ..... **$ 3029.00**

FP's Air Circulation System II



Experienced cultivators understand the critical role air circulation plays in the successful growing of mushrooms. Without proper air input and distribution, there is little chance of obtaining consistently large fruitings. **Fungi Perfecti** has developed an air system that has been specifically designed for the home grower. This system regulates humidity within the growing environment. Baseline humidity is maintained by a **Herrmidifier** humidifier utilizing water via a faucet or garden hose. Pressurized water is forced through **fine spray mist nozzles**, regulated by an on/off **solenoid valve**, which is activated by a **humidistat**. Through the use of evaporative cooling, a temperature drop of 15–25° F can often be achieved. **Our Air Circulation System II** combines air distribution and humidification in one package for grow rooms up to 3000 cubic feet in volume.

The Air Circulation System II Package Includes:

1) A 217 CFM Plenum Fan
2) An in-line 300 CFM Super Booster Duct Fan
3) A galvanized sheet metal housing that can recirculate the growing room's air in whatever combination desired
4) A metal-framed, 12 x 12 x 5.8 inch .3 micron HEPA filter efficient in 100% humidity environments
5) 20 feet of perforated 8 inch diameter convection tubing
6) A 6 gallon/day humidifier
7) 8 fine mist nozzles
8) An on/off 1/2 inch solenoid valve
9) A duct humidistat that becomes increasingly accurate at higher humidity

ACS002† (45 lbs.) for grow rooms up to 3000 cubic feet ..... **$ 899.00**

We also offer a version of the **Air Circulation System II** for 230V/50Hz applications.
ACS002E† (60 lbs.)..... **$ 1,125.00**

ORDER LINE: (800) 780-9126 • PHONE: (360) 426-9292
FAX: (360) 426-9377 • email: mycomedia@aol.com

The Shiitake Mushroom** ***(Lentinula edodes)
Shiitake mushrooms have been hailed for both their culinary and medicinal benefits in Japan and other parts of Asia for hundreds of years, and their popularity worldwide increases every year. Found primarily on thicker-barked hardwoods like oak, they also do well on "scrub" hardwoods like alder. Mycelium is whitish in color, becoming brown with age. When properly cared for, our hardy strain of Shiitake will begin to fruit in as little as 6 months, with the most substantial fruitings appearing 1 year from inoculation.
100 Sterilized Plugs **PSLE100** (.5 lb.)..... **$ 9.95**
300 Sterilized Plugs **PSLE300** (1.5 lbs.)..... **$ 19.95**
1000 Sterilized Plugs **PSLE1000** (5 lbs.)..... **$ 34.95**
Sawdust Spawn, sufficient for 30–50 logs **S20** (5 lbs.)..... **$ 19.00**

Chicken-of-the-Woods** ***(Polyporus sulphureus)
This mushroom inhabits a wide variety of hardwoods and softwoods throughout North America. Perhaps the most beautiful strain in our culture collection, the mycelium is distinctly orangish in color. Partially buried logs and stumps can be inoculated with this species. This brilliant, shelf-like mushroom has the flavor of white chicken meat and is considered a favorite edible among many mycophiles. (Note: We do not recommend inoculating eucalyptus, cedar, redwood or aromatic pines.)
100 Sterilized Plugs **PSPS100** (.5 lb.)..... **$ 12.95**
300 Sterilized Plugs **PSPS300** (1.5 lbs.)..... **$ 24.95**

The Reishi/Ling Chi Mushroom ***(Ganoderma lucidum)***
This species quickly assaults hardwood stumps or partially buried logs. Producing a conk-like mushroom, similar to famed Artist Conk, but with a smooth, polished surface, deep reddish brown in color on top and with a white pored underlayer. Used in teas, it imparts a subdued, non-narcotic peaceful feeling to those who ingest it.
100 Sterilized Plugs **PSGL100** (.5 lb.)..... **$ 12.95**
300 Sterilized Plugs **PSGL300** (1.5 lbs.)..... **$ 24.95**

The Maitake Mushroom ***(Grifola frondosa)***
Maitake is one of the most popular of woodland mushrooms, well known to mushroom lovers of Eastern North America as Hen-of-the-Woods. Preferring hardwood stumps, clusters of ***Grifola frondosa*** have been recorded in excess of 100 lbs.
100 Sterilized Plugs **PSGF100** (.5 lb.)..... **$ 12.95**
300 Sterilized Plugs **PSGF300** (1.5 lbs.)..... **$ 24.95**

The Lion's Mane Mushroom** ***(Hericium erinaceus)
Hericium erinaceus prefers hardwoods, particularly oaks, elms, poplars and maples. Shaded stumps or partially buried logs are recommended sites for its cultivation.
100 Sterilized Plugs **PSHE100** (.5 lb.)..... **$ 12.95**
300 Sterilized Plugs **PSHE300** (1.5 lbs.)..... **$ 24.95**

The Conifer Coral Mushroom *(Hericium abietis)*

Hericium abietis grows exclusively on conifers and is very similar in appearance to ***Hericium erinaceus***. Native to western North America, the Conifer Coral Mushroom has a delicate and pleasant flavor. Stumps or partially buried, horizontally-oriented logs are recommended for inoculation.

100 pre-inoculated Plugs **PSHA100** (.5 lb.) ..... **$ 12.95**
300 pre-inoculated Plugs **PSHA300** (1.5 lbs.) ..... **$ 24.95**

The Tree Oyster Mushrooms *(Pleurotus ostreatus)*

Oyster mushrooms have long been a favorite of many, commonly collected on logs and stumps. Probably the easiest to grow of the mushroom species we offer, this mushroom thrives on hardwoods throughout North America.

100 Sterilized Plugs **PSPO100** (.5 lb.)..... **$ 12.95**
300 Sterilized Plugs **PSPO300** (1.5 lbs.)..... **$ 24.95**

The Phoenix Oyster *(Pleurotus pulmonarius)*

This species of Oyster mushroom attacks conifer stumps and logs, especially spruces and fir.

100 Sterilized Plugs **PSPP100** (.5 lb.) ..... **$ 12.95**
300 Sterilized Plugs **PSPP300** (1.5 lbs.) ..... **$ 24.95**

The Elfin Community Pack

Buy any 3 species (100 or 300 plugs each) of your choice.

100 plugs each **ECP1** (1.5 lbs.) ..... **$ 29.95**
300 plugs each **ECP3** (4.5 lbs.) ..... **$ 54.95**

Accessories for Log and Stump Cultivation

These products can help ensure success in log and stump cultivation:

Sealing Wax

High quality, clear cheese wax for the sealing of Plug Spawn inoculation sites. Can be applied with a brush or turkey baster. Melting temperature of 145° F (please remember to always use caution when working with hot wax!). Available in 1 or 10 lb. increments.

WAX010 (2 lbs.)..... **$ 3.95**
WAX100 (11 lbs.)..... **$ 29.95**

Sawdust Palm Inoculator

Measuring 14 inches long, this palm thrust inoculator facilitates the rapid inoculation of logs using sawdust spawn. With each stroke, a 1 x 3/8 inch plug of spawn can be inserted into the log. The spring activated shaft returns to position allowing for the next inoculation with ease. Complete with comfortable hand grip, a 2 inch flat palmer, all brass shaft.

SPI100 (2 lbs.)..... **$ 29.95**

Light Meters

Triple Range Light Meter

A pocket size, color-corrected meter for reading light from 10 foot candles to 1000. Manufactured by General Electric, this light meter is essential for growers of species whose yields are influenced by light.

LIT214 (2 lbs.)..... **$ 99.95**

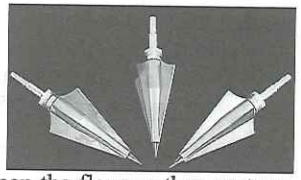
Plastic Ducting & Accessories

Plastic Air Ducting

Fungi Perfecti stocks inflatable polyethylene tubing for the even distribution of air throughout the growing room environment. This tubing is also ideal for "column culture", the growing of mushrooms in a vertical configuration. 4 mil thickness.

6 inch diameter Unpunched Ducting
20 feet **DUC6000** (1 lb.)..... **$ 7.95**
500 feet **DUC6500**† (40 lbs.)..... **$ 109.00**
6 inch diameter Ducting with holes at 4 & 8 o'clock
20 feet **DUC6048** (1 lb.) ..... **$ 8.95**
500 feet **DUC6548**† (40 lbs.) ..... **$ 119.00**
8 inch diameter Unpunched Ducting
20 feet **DUC8000** (1 lb.) ..... **$ 9.95**
500 feet **DUC8500**† (45 lbs.) ..... **$ 129.00**
8 inch diameter Ducting with holes at 4 & 8 o'clock
20 feet **DUC8048** (1 lb.) ..... **$ 10.49**
500 feet **DUC8548**† (45 lbs.) ..... **$ 145.00**
10 inch diameter Unpunched Ducting
20 feet **DUC1000** (1 lb.) ..... **$ 10.95**
500 feet **DUC1500**† (50 lbs.) ..... **$ 149.00**
12 inch diameter Unpunched Ducting
20 feet **DUC1200** (1 lb.) ..... **$ 12.95**
500 feet **DUC1250**† (55 lbs.) ..... **$ 179.00**
16 inch diameter Ducting with holes at 4 and 8 o' clock
20 feet **DUC1648** (1 lb.) ..... **$ 16.95**
500 feet **DUC16548**† (60 lbs.)..... **$ 199.00**

Stainless Steel Arrowheads



For the perforation of plastic ducting for column culture of oyster and other mushrooms, these stainless steel 4-bladed, replaceable arrowheads are ideal. Each puncture gives a 1 1/16th inch diameter, star-shaped cutting pattern. After puncture, the flaps close, but the central hole (approximately 1/8 inch) is large enough to allow gas exchange. At each puncture, bouquets of oyster mushrooms will emerge, pushing open the flaps as they mature. This method preserves moisture while localizing primordia formation. Stainless steel blades are removable/replaceable. Highly recommended for all oyster growers striving to maximize production while limiting loss of yield due to evaporation. Packages of 6.

SSA600 (1 lb.)..... **$ 26.95**

5 Amp Variable Motor Speed Controls

These manual motor speed controls can be used with most shaded-pole or permanent split capacitor motors in their amperage range, such as those in our **FAN900S** *and* **FAN1200S Ducted Fans** (larger fans should be controlled with the **VMS400S** or **VMS500S Motor Speed Controls**, below). Controls motor speed between 20 and 100% of total fan capacity, (**Note:** the manufacturer recommends operating any fan at a minimum of 30% capacity to protect the motor) and can also act as an on/off switch. Supplied in a watertight electrical enclosure with code-approved connectors. Available in 115 or 230V capacities.

VMS115S for 115V current (2 lbs.).....**$ 59.95**
VMS230S for 230V current (2 lbs.).....**$ 69.95**

12.5 Amp Variable Motor Speed Control

A durable, high-amperage motor speed control for larger fans such as the **FAN1600S**, **FAN2013S** and **FAN2012S**, this unit can also be used to control two or more smaller fans at once (**Note:** total amperage of all fans connected must not exceed 12.5 amps. The manufacturer recommends operating any fan at a minimum of 30% capacity to protect the motor). Capable of operating at both 115 and 230V. Includes watertight enclosure with wall mount.

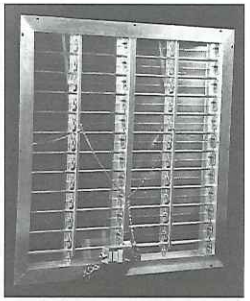
VMS400S (2 lbs.).....**$ 109.00**

Automatic Variable Motor Speed Control

This ingenious device enables the cultivator to automate the process of ventilation in the growing environment. Once a baseline fan speed and desired temperature are set, a thermostatic sensor tracks the temperature and increases power to the fan as temperatures rise. Capable of controlling motor speed from 0–100% (a minimum of 30% is recommended for most fans), with a 10 amp capacity. Temperature differential can be set from 1–21˚F (set to 6˚ at factory). Features include adjustable automatic shutoff, RFI noise filter and a temperature sensor that can be extended 1000 feet. Comes in a watertight housing. 2 year warranty.

VMS500S (3 lbs.).....**$ 239.00**

Motorized Aluminum Shutters



These heavy-duty metal shutters can be used at the "upstream" or "downstream" end of a laboratory or grow room air system to act as a barrier during periods of no air flow. Also useful for restricting fresh-air flow into the plenum of a grow room when increased air recirculation is required. Each shutter comes with a sealed, UL-approved precision motor that can be used at either 115 or 230V.

24" Shutter **MAS24S**† (15 lbs.).....**$ 189.00**
36" Shutter **MAS36S**† (18 lbs.).....**$ 224.00**
48" Shutter **MAS48S**† (20 lbs.).....**$ 279.00**

Visit us on the Web at www.fungi.com for the most up-to-date mushroom information, products and pricing!

VII. CONSULTATION SERVICES

Technology Transfer/Design/Strain Selection/Personnel Training

For those embarking on mushroom cultivation as a commercial enterprise, our **Consultation Services** can be invaluable. Avoid the possible pitfalls and miscalculations plaguing start-up companies by employing our Consultation Services. Personally directed by Paul Stamets, author of ***Growing Gourmet & Medicinal Mushrooms*** and co-author of ***The Mushroom Cultivator***, we can assist in designing state-of-the-art cultivation facilities. Our select strains are offered, by license only, to key individuals and companies in each geographical/marketing region. (These strains are from our private reserve and are not listed elsewhere in this catalogue.) We can even train your personnel at our facility. Our multifaceted talents and depth of experiences establishing gourmet mushroom farms around the world can greatly benefit any new start-up company. Our fees are reasonable. Each application is considered on an individual, confidential basis.

Production Systems for Select Mushroom Strains

I. Shiitake

We have developed a revolutionary, rapid cycle method for the indoor cultivation of Shiitake ***(Lentinula edodes)***. Our system results in first harvests of Shiitake in 30–40 days from inoculation onto sterilized, enriched sawdust/bran. Yields range from 25–50% of substrate mass. This system utilizes the combination of a ***unique strain/substrate matrix/initiation strategy*** to accelerate the Shiitake production cycle months ahead of any other method.

II. Oysters

Isolated from the wild, our private **Strain Library** boasts several strains whose speed of growth, quality of fruitbody, and market acceptance surpasses that of most any being grown currently by would-be competitors. Flushes can commence as soon as 15 days after inoculation onto straw. Cultivation in plastic or netted columns allows for easy material handling and cropping. Since oyster mushrooms are more fragile than most other commercially grown mushrooms, reducing their shelf-life, there are excellent opportunities for local producers to capture market share from out-of-state producers.

III. Enokitakes

After years of isolations we have developed a new strain of Enokitake ***(Flammulina velutipes)*** whose performance compares favorably with any from the Orient. Isolated from mountains of Colorado, this strain produces prolifically between 50–70˚ F. An excellent edible, with uniquely beneficial medicinal properties, this species is worthy of consideration by North American entrepreneurs.

IV. King Stropharia

*FP has long been a pioneer in the promotion of **Stropharia rugoso-annulata, a.k.a. The Garden Giant**™ on waste wood debris. With increasing emphasis on composting and recycling in urban and rural communities, we encourage everyone to consider this species for its remarkable ability to break down wood wastes. In the course of growing this giant edible, the wood debris is reduced to rich soil. A wonderful species for neighborhood recycling/gardening.*

V. Maitake

Maitake ***(Grifola frondosa)*** has recently drawn much attention for its medicinal properties (until clinical studies confirm activity, no medical claims can be stated). Also a succulent and coveted gourmet mushroom, Maitake may well prove to be *the* mushroom of the 90's and beyond. Our culture libraries include some extraordinarily high-yielding strains.

VI. Reishi/Ling Chi

This mushroom ***(Ganoderma lucidum)*** is the premier medicinal mushroom, and is held in the highest esteem by practitioners of Asian medicine. Our strain library has yellow, red, purple and black forms which have been selected for commercial potential. Not as technically demanding as Maitake in its cultivation strategy, well established markets exist for Reishi, increasingly for mushrooms which are organically grown.

VII. Others

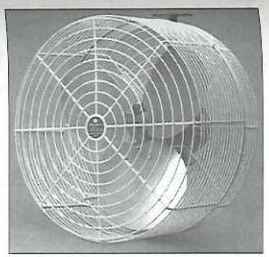
Our expertise is not restricted to just the aforementioned species. There are many other species to consider—such as ***Morchella spp.*** (Morels), ***Hericium spp.*** (Lion's Mane), and other **Fungi Exotica**—depending upon your level of knowledge, location, materials, and markets. If you have a project in mind, let us help you. Just call or write. You may be surprised by our resourcefulness.

Prices / Scheduling

Paul Stamets is available for professional consultation on mushroom cultivation over the phone. Cost is **$ 150.00** per hour, with a 1/2 hour minimum. Most consultations take place on Tuesday mornings. Please call at least a week in advance to make an appointment. Those with appointments should write, fax or email us a detailed letter outlining the questions/problems they wish to cover during the consultation, in order to make optimum use of their time. We encourage all cultivators to attend the Stamets Seminars to further refine their skills.

Paul Stamets is also available for intensive on-site consultation and personal tutelage, at either your facilities or ours. For a complete list of consultation levels and fees, please contact Fungi Perfecti.

Grow Room Circulation Fans



Circulation fans can help you to make the most of existing heating and humidification systems in your grow rooms. By increasing the overall turbulence, heated/humidified air can be more evenly distributed throughout the growing environment. A well-placed circulation fan can also add extra dispersion distance to devices such as our **Turbo Humidifans**. Moisture-resistant sealed-bearing motor is quiet and efficient and includes a motor mount for easy installation. Dual voltage for 115 or 230V operation. Can be used with our **VMS115S**, **VMS230S**, **VMS400S** or **VMS500S Motor Speed Controls**.

12" Grow Room Circulation Fan, 1/10 HP, 2600 CFM, .9 amps @115V
FANC12S (12 lbs.).....**$ 169.00**

20" Grow Room Circulation Fan, 1/3 HP, 6000 CFM, 3.8 amps @115V
FANC20S† (20 lbs.).....**$ 229.00**

24" Grow Room Circulation Fan, 1/2 HP, 8500 CFM, 4 amps @115V
FANC24S† (24 lbs.).....**$ 279.00**

All Purpose Blower

488 CFM free air delivery, 217 CFM at .8" static pressure. Draws 1.43 amps. A superb, multipurpose fan excellent for use in greenhouses, growing rooms, and for pushing air through small dimension micron filters. (12 x 12" and 24 x 12" HEPA's). Because of the attached split capacitor, a better operating efficiency is achieved.
FAN667 (13 lbs.).....**$ 159.00**

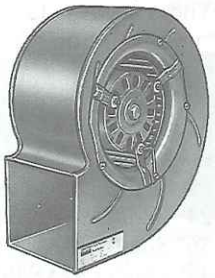
All-Purpose Blower for 230V/50Hz applications. 497 CFM free air delivery, 265 CFM at .8" static pressure. Draws 1.41 amps.
FAN870 (15 lbs.).....**$ 169.00**

1/3 Horsepower Blower

4-speed, 115V/60Hz blower, maximum 1,653 CFM at .8" static pressure. Draws 5.1 amps. A useful fan for delivering air into air circulation systems for growing rooms, spawn laboratories and incubation chambers. Also ideal for blowing air into 2 x 4 foot HEPA filters (use 2nd highest speed). **Note:** not for free air delivery. Must be used with at least .7" static pressure (all our HEPA filters are .8" static pressure).
FAN685† (35 lbs.).....**$ 335.00**

Steel Mounting Bracket for attaching air outlet of blower to laminar flow hoods, plenum intakes, etc.
FAN685B (4 lbs.).....**$ 29.95**

FP's Universal Blower



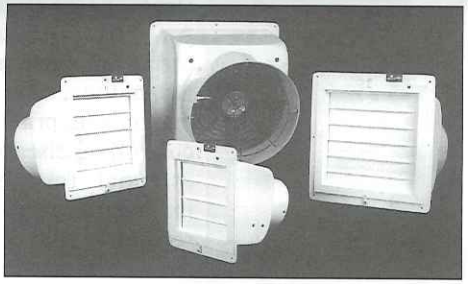
This high-power, multi-purpose blower is the perfect choice for pushing air through our 24 x 18, 24 x 24 and 24 x 36" HEPA filters. Dual-voltage power supply operates at either 115 or 230V. Delivers 1,092 CFM at .8" static pressure (60Hz). Draws 8.6 amps @115V.
FAN831† (35 lbs.).....**$ 265.00**

Steel Mounting Bracket for attaching air outlet of blower to laminar flow hoods, plenum intakes, etc.
FAN831B (3 lbs.).....**$ 24.95**

Floor-Mount Brackets for attaching blower to horizontal surfaces (air outlet will run parallel to mounting surface).
FAN831FB (2 lbs.).....**$ 16.95**

Fans & Accessories

Shuttered Flush-Mount Ducted Fans



These powerful, versatile fans are ideal for many applications within the growing environment. Originally designed for use as exhaust fans, they are also well suited for use as plenum fans or for introduction of air into convection tubing (order tubing one size larger than blade diameter of fan: i.e., for 12" blade diameter, order 16" ducting). Fully enclosed, thermally protected motors are designed for use in high-humidity environments. Heavy molded polyethylene housings with integral shutters won't rust or corrode and have a lifetime warranty. A flange around the base of the housing allows for easy mounting of the fan. Dual-voltage motor operates at either 115 or 230 volts and can be used in conjunction with the **VMS400S** and **VMS550S Speed Controls** on page 58. Available in five different sizes/capacities.

9" Ducted Fan, 1/6 HP, 1091 CFM @.05" static pressure, 1.9 amps @115V.
FAN900S† (15 lbs.) ..... **$ 289.00**

12" Ducted Fan, 1/6 HP, 1538 CFM @.05" static pressure, 2.2 amps @115V.
FAN1200S† (18 lbs.) ..... **$ 329.00**

16" Ducted Exhaust Fan, 1/3 HP, 3085 CFM @.05" static pressure, 3.8 amps @115V.
FAN1600S† (22 lbs.) ..... **$ 359.00**

20" Ducted Exhaust Fan, 1/3 HP, 3533 CFM @.05" static pressure, 3.8 amps @115V.
FAN2013S† (25 lbs.) ..... **$ 379.00**

20" Ducted Exhaust Fan, 1/2 HP, 4966 CFM @.05" static pressure, 4 amps @115V.
FAN2012S† (30 lbs.) ..... **$ 449.00**

In-line Duct Fans

Helpful aids in boosting air volume through plastic ducting in smaller growing environments, these light weight, duct fans are easy to install and quiet. Warrantied for 2 years. The 6" fan delivers 200 CFM at .40 amps while the 8" fan yields 300 CFM at .46 amps.

FAN6716 (4 lbs.) ..... **$ 44.95**
FAN8718 (5 lbs.) ..... **$ 49.95**

Tarzan Fan

350 cubic feet/minute free air delivery. A high pressure fan perfect for pushing air through 8 or 12" square micron filters. Yielding 90–100 CFM at 1" static pressure. Draws 1.4 amps.

FAN350 (6 lbs.) ..... **$ 139.00**
FAN350E (6 lbs.) for 230V/50Hz applications ..... **$ 149.00**
FAN350E not exactly as pictured at right

Thermal Exhaust Fans

Exhaust fans with automatic louvered shutters that are well suited for exhausting excess heat from the grow room. Heavy-duty guards are moisture and corrosion resistant. The 10" fan yields 520 CFM and draws only 1 amp. The 16" fan yields 870 CFM and draws 1.9 amps.

10" fan **FAN819**† (10 lbs.) ..... **$ 159.00**
16" fan **FAN713**† (12 lbs.) ..... **$ 229.00**

VIII. THE STAMETS CULTIVATION SEMINARS

We conduct in-depth workshops on mushroom cultivation, emphasizing a hands-on approach at our gourmet mushroom research station. Participants learn tissue culture, spawn generation techniques, substrate preparation, inoculation techniques, and strategies for maximizing yields. Each participant receives seven select mushroom strains for their own personal use (the cultures alone have a value in excess of $ 500.00). The cultivation of Shiitake, Oyster, Enokitake, King Stropharia, Reishi, Maitake and Morels are covered in detail. Space is limited. Registration is on a first-come basis. Food and lodging are not included. Required textbooks: ***The Mushroom Cultivator*** and ***Growing Gourmet & Medicinal Mushrooms***. These informationally intense courses are taught personally by Paul Stamets. Further information will be sent upon registering. Since space is limited, early registration is strongly advised. Registration fee is not refundable. Registration must be reconfirmed via phone two weeks prior to seminar. Four basic sessions and one advanced session are conducted each year. Paul Stamets is considering hosting a weekday cultivation seminar in 1999 (exact date will be determined by public response), to accommodate those with obligations that may interfere with their attendance of a weekend seminar. Call for details.

Registration: $ 500.00

Spring Sessions
The last weekend in March
The second weekend in May

Fall Sessions
The second weekend in September
The first weekend in November

Summer Session:
The second weekend in July

The Stamets Master's Course: An annual event reserved only for graduates of the Beginner's Seminars, this weekend event delves into the finer subtleties of mushroom culture. Formula and strategy oriented, each participant receives 20 cultures for their own personal use. This course is limited to 20 students.

Registration: $1000.00

Summer Session:
The first weekend in June

Paul Stamets is available for instructing educational seminars anywhere in the world. You can call, write or fax him care of Fungi Perfecti.

ORDER LINE: (800) 780-9126 • PHONE: (360) 426-9292
FAX: (360) 426-9377 • email: mycomedia@aol.com

IX. FP'S PURE CULTURE SPAWN

Ready-to-inoculate, pure mushroom spawn is offered for five species. We maintain stock of these species for use as inoculum into bulk substrates. Grain spawn is offered in two forms: a first- or second-generation Grain Master in a 1-gallon jar complete with autoclavable lid and .3 micron synthetic filter disc (approximate yield 2/3 gallon), and end-user spawn in an 8-lb Spawn Bag with Filter Patch. Each Grain Master can be expanded up to 1000 times its mass. Sawdust Spawn is offered in a 5-lb. spawn bag with filter patch. Turnaround time for most orders is 2–3 days; however, occasional backorders may occur. Please check the availability and estimated date of shipping for your spawn when ordering. Spawn does not come with instructions for use: we recommend cultivators read ***Growing Gourmet and Medicinal Mushrooms*** and ***The Mushroom Cultivator*** in preparation for using spawn. We do our very best to insure that quality spawn is produced. We can not, however, be responsible for the condition of spawn once shipped. We prefer to ship via UPS 2nd Day Air or Federal Express. If the spawn arrives defective, it will replaced at no charge provided we are notified within 48 hours of delivery and the defective spawn is returned. Since we cannot control the methods by which this spawn is used, no promises or claims about yields are made (there are simply too many factors involved). This spawn is being offered as a service. *We encourage all commercial cultivators to develop sterile culture skills to create their own spawn.* Promoting sterile culture is our business. See page 25 for our popular workshops revealing spawn generation techniques.

MUSHROOM	FORM OF	ITEM#	COST
Lentinula edodes (Shiitake)	Grain Master (1 Gallon Jar)	**S10**	**$ 29.00**
	Grain Spawn (8 lb. Bag)	**S105**	**$ 35.00**
	Sawdust (5 lb. Bag)	**S20**	**$ 19.00**
Pleurotus ostreatus (Oyster)	**Warm-weather Strain**		
	Grain Master (1 Gallon Jar)	**S15**	**$ 29.00**
	Grain Spawn (8 lb. Bag)	**S155**	**$ 35.00**
	Sawdust (5 lb. Bag)	**S250**	**$ 16.00**
Stropharia rugoso-annulata (The Garden Giant)	Wood Chips (5 lb. Bag)	**S300**	**$ 20.00**
Morchella esculenta (True Morel)	Grain Master (1 Gallon Jar)	**S400**	**$ 29.00**
	Grain Spawn (8 lb. Bag)	**S405**	**$ 35.00**
Morchella angusticeps (Black Morel)	Grain Master (1 Gallon Jar)	**S450**	**$ 29.00**
	Grain Spawn (8 lb. Bag)	**S455**	**$ 35.00**

Quantity discounts on spawn available for orders of 10 or more units. Contact us for details

Gas Detectors

Draeger Gas Detection System
A compact, high quality gas detection system that measures carbon dioxide, ammonia and assorted other gases in parts per million. Precise knowledge of gases are critical for maximizing primordia formation and development, and for controlling diseases. For the commercial grower, this tool is essential for insuring yields. Comes with complete instructions and accessories. Tubes should be ordered separately. 100 cc pump, carrying case, spare parts, and instructions included. Five year warranty.
GAS534 (2 lbs.) ..... **$ 550.00**

Gas Detector Tubes
For use with the **GAS534**. Each tube is good for several sequential readings but must be used immediately upon opening. Sold in sets of 10.
CO_2 Detection Tubes (.1–6% volume)
GAS202 (1 lb.) ..... **$ 64.95**
Ammonia Detection Tubes (5–700 ppm)
GAS030 (1 lb.) ..... **$ 64.95**

Insect Control

SpinSect Insect Trapper
An ingenious device for controlling flying insects in the growing environment. This is how it works: a circular black light attracts flying insects. When they are in close proximity, they are drawn to their death via an invisible vortex created by a centrally located fan within the center of the light. The flying pests are then thrown into a disposable bag where, God only knows, they somehow die or remain trapped until you enter the picture. Dimensions: $15^{3/4}$ inches high, $9^{1/2}$ inches wide, $7^{1/2}$ inches deep. Recommended for 500–1000 square feet.
SIT100 (10 lbs.) ..... **$ 225.00**
Spare bulbs **SITB** (1 lb.) ..... **$ 36.95**

A Note to our International Customers

We have tried, whenever possible, to provide options for our customers who live in countries where electricity runs at 50 cycles per second (50Hz) instead of 60. An item code that ends in an "E" usually indicates a product that is meant for 50Hz current, such as the **LFHIE** (The Series I Laminar Flow Hood) or **WB700E** (The Waring Blender Base for Eberbach Containers). Please note that, due to the variety of electrical outlets worldwide, the purchase of an adapter of some sort may be required to meet your country's outlet configuration. In cases where a 50Hz version of a product is not available, the item can usually be safely used with an electrical transformer installed between the product and the wall current. We offer a 500VA stepdown transformer for this purpose:
SDT500 (15 lbs.) ..... **$ 259.00**
Please consult with an electrician in your area to insure compatibility. If you have questions concerning the use of our products, please feel free to contact us.

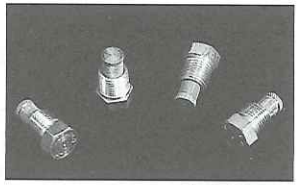
The Mushroom Humidifier

A commercial humidifier for greenhouses and mushroom growing rooms, the Mushroom Humidifier maintains rH in spaces up to 3000 cubic feet. Atomizing water to droplets approximately 10 microns in diameter, this humidifying unit transforms 6 gallons of water per day into a fine particle mist promoting mushroom and plant growth. Water level automatically regulated.

HUM500 (9 lbs.).....**$ 259.00**
HUM500E (9 lbs.) for 230V/50Hz applications.....**$ 275.00**

Fine Mist Nozzles

With fine mesh screens to help prevent clogging, these brass 3/8 inch male threaded nozzles are easy to install and replace. Emitting a fog-like mist at the remarkably controlled rate of only .63 gallons per hour at 40 psi with a spray angle of 80 degrees. This is an ideal nozzle for outdoor or indoor growing environments.



MLN500 (.1 lb.) .....**$ 6.49 ea.**
10-100 .....**$ 5.49 ea.**
100 or more.....**$ 3.49 ea.**

Soaking Nozzles

Dispersing over 39 gallons per hour at 30 psi in a 360 degree circle, this male threaded 3/8 inch nozzle is ideal for the controlled soaking of Shiitake logs and outdoor beds.

MLN550 (.1 lb.) .....**$ 7.49 ea.**
10 or more.....**$ 6.49 ea.**

L-Jet Spray Nozzles

Emitting 30 gallons per hour @ 40 psi with a 120 degree spray angle, these nozzles are especially appropriate for watering Shiitake logs and/or outdoor beds. 3/8 inch NPT thread.

MLN1000 (.1 lb.) .....**$ 3.95 ea.**

V-Jet Flat Spray Nozzles

Emitting 24 gallons per hour at 40 psi with a spray angle of 80 degrees, these 3/8 inch. NPT male threaded nozzles are used for making water brooms or "wash-down" systems within the growing room.

MLN2000 (.1 lb.) .....**$ 3.95 ea.**

Solenoid Valve

A superior, two-way "on-off" brass solenoid valve for automatic control of flow in water lines. Features a molded, waterproof 120V/60Hz cycle coil. This unit is recommended for use with the **HC201 Humidistat** (see page 52) in growroom humidification systems. Or couple it with our **24 Hour/15 Minute Interval Timer** (see page 51) for use in an automated watering system. Its uses are limited only by your ingenuity! Operates at 0–100 psi.

SOLE500 (3 lbs.) .....**$ 89.95**

X. LIVE MUSHROOM CULTURES IN TEST TUBES

A Select Library of *In Vitro* Strains

The strains represented here are unique. Some are rare, not being available from culture libraries in North America, and potentially high yielding. We are constantly working with these strains, screening and maintaining cell lines. **Fungi Perfecti** is releasing the following strains for use on a conditional basis.

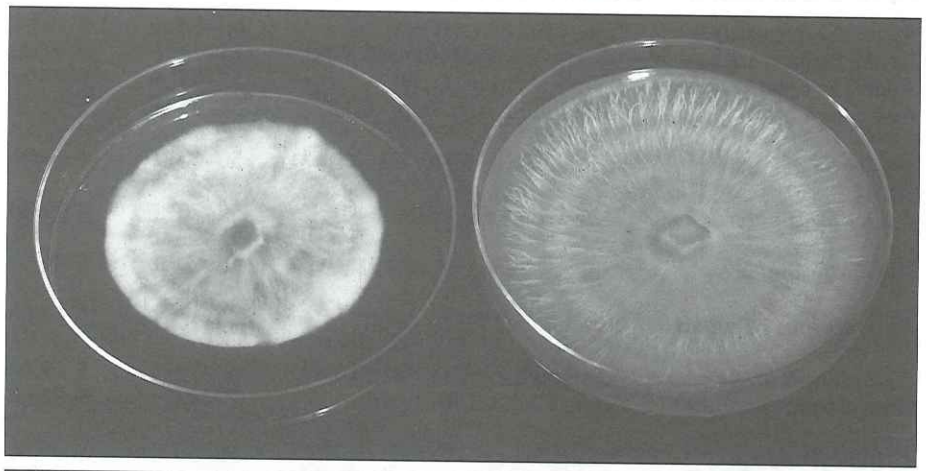
By purchasing these cultures, the customer agrees to the following terms. The purchaser is authorized by **Fungi Perfecti** to utilize our pure mushroom Spawn and Cultures for their own personal mycological experimentation, for the production of mushrooms for resale, and for the generation of additional mushroom spawn for the production of mushrooms for resale. The purchaser consents to use these strains for private use and not to generate spawn from them for resale or unauthorized distribution. Violators are subject to prosecution. The purchaser further agrees that mini-trials will be conducted prior to use in any commercial enterprise to assess their efficacy. The purchaser cannot and will not represent nor sell our strains in any form. Once shipped, **Fungi Perfecti** can not be responsible for the condition of any cultures. **Fungi Perfecti** will replace a culture if defective or should you lose it within one year of purchase at no additional charge.

Each strain is designated with the **Stamets "P-value"** scale, signifying the expansion of mycelium covering a 100 x 15 mm. petri dish (approximately 1,000–2,000 cell divisions). The first time a wild species is tissue cultured, the age is denoted as **P-O**. Thereafter each successive growth over the petri dish's surface is described in increments of **P-1**, etc. This library tries to maintain strains closest to their wild origins or closest to their peak fruiting potentials. Each culture comes in a 125 x 20 mm. glass test tube.

GENUS & SPECIES	COMMON NAME / ITEM#	FRUITING TEMP. RANGE	PRICE
Agaricus augustus	"The Prince" **C50**	60–70° F	**$ 49.00**
Agaricus bitorquis	"Warm-Weather Button" **C110**	75–77° F	**$ 49.00**
Agaricus brunnescens	"White Button" **C100**	55–65° F	**$ 49.00**
Agaricus ("portobello")	"The Italian *Agaricus*" **C125**	55–65° F	**$ 49.00**
Agrocybe aegerita	"Brown Swordbelt" **C130**	50–60° F	**$ 59.00**
Auricularia polytricha	"The Wood Ear" **C25**	55–70° F	**$ 59.00**
Coprinus comatus	"Shaggy Mane" **C160**	60–70° F	**$ 59.00**
Flammulina velutipes	"Enokitake" **C170**	40–50° F	**$ 59.00**
Ganoderma oregonense	"Oregon Ling Chi" **C180**	60–70° F	**$ 39.00**
Ganoderma lucidum	"Ling Chi" **C190**	70–80° F	**$ 59.00**
Grifola frondosa (Polyporus frondosus)	"Maitake" or "Hen of the Woods" **C200**	50–60° F	**$ 89.00**
Hericium erinaceus	"Lion's Mane" **C255**	60–80° F	**$ 49.00**

GENUS & SPECIES	COMMON NAME / ITEM#	FRUITING TEMP. RANGE	PRICE
Hypholoma capnoides	"Clustered Wood-Lover" **C202**	45–60° F	**$ 59.00**
Hypholoma sublatertium	"Kuritake" **C203**	50–60° F	**$ 59.00**
Hypsizygus tessulatus	"Buna-Shimeji" or "The Beech Oyster" **C205**	50–60° F	**$ 89.00**
Hypsizygus ulmarius	"Shirotamagitake" or "The Elm Oyster" **C210**	50–55° F	**$ 89.00**
Lentinula edodes	"Shiitake"		
	"Solstice Strain" **C222**	55–75° F	**$ 59.00**
	"Winter Giant" **C225**	45–60° F	**$ 59.00**
	"Alder Strain" **C237**	50–65° F	**$ 59.00**
Lepiota rachodes	"Scaly *Lepiota*" **C250**	50–65° F	**$ 59.00**
Lepista nuda	"Wood Blewitt" **C260**	40–55° F	**$ 59.00**
Morchella esculenta	"True Morel" **C280**	40–50° F	**$ 59.00**
Morchella angusticeps	"Black Morel" **C285**	40–50° F	**$ 79.00**
Pholiota nameko	"Nameko" **C290**	50–60° F	**$ 79.00**
Pleurotus djamor	"Pink Oyster" **C333**	65–85° F	**$ 79.00**
Pleurotus eryngii	"King Oyster" **C335**	50–60° F	**$ 79.00**
Pleurotus ostreatus	"Pearl Oyster " **C350**	50–60° F	**$ 59.00**
Pleurotus pulmonarius	"Phoenix Oyster" **C360**	60–80° F	**$ 59.00**
Volvariella volvacea	"Paddy Straw" **C370**	80–90° F	**$ 79.00**

Special Culture offer: Buy any ten species or varieties for **$ 500.00**.



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HC201 Relay
When utilizing the **HC201 Humidistat** with devices that have a greater startup amperage than **42 amps** (to roughly calculate startup amps of a device, multiply the normal operating amperage by 6), it is necessary to install a **relay** between the humidistat and the device being controlled. Includes a watertight enclosure. (**Note:** this device must be installed by an electrician to local codes!)

HC201R (3 lbs.) ..... **$ 69.95**
HC201RE (3 lbs.) for 230V/50Hz applications ..... **$ 89.95**

Humidifiers & Watering Devices

Turbo Humidifans

FP's Turbo Humidifans provide high quality micron-sized fog and ventilation in one unit. Capable of projecting up to 50 gallons of water per hour and over 3,000 cubic feet per minute, with a propulsion distance of 40 feet (1 HP Humidifan, other Humidifans have different specifications). These exceptional units are perfect for mushroom cultivators. Because the Turbo Humidifans do not use nozzles to create water droplets, they are remarkably resistant to clogging, even when used with water containing high levels of iron, calcium or other minerals. Can be mounted at one end of your room, directly below your air ducting for effective dispersal down the length of your grow room. Or use the optional oscillator (pictured at right) and mount the Turbo Humidifan centrally, for up to 360° dispersal of humidity. On average, a 15–25° F temperature drop of outside air from evaporative cooling can be realized. Each unit comes with an adjustable flow-meter which allows the grower to adjust the rate of humidification. Corrosion resistant, with brass fittings and stainless steel hardware. Comes with a 12 foot power cord and a 20 foot water line. 1 year warranty.

HUM330† (45 lbs.) ..... **$ 639.00**
1/6 HP, 2.6 amps, 11 GPH, 1310 CFM w/20 ft. propulsion distance

HUM660† (55 lbs.) ..... **$ 689.00**
1/3 HP, 4.4 amps, 24 GPH, 2500 CFM W/25 ft. propulsion distance, for 230V/50Hz

HUM1000† (55 lbs.) ..... **$ 709.00**
1/2 HP, 7.2 amps, 40 GPH, 2730 CFM w/30 ft. propulsion distance

HUM2000XE† (65 lbs.) ..... **$ 729.00**
1 HP, 10.4 amps, 50 GPH, 3260 CFM w/35 ft. propulsion distance

HUM1500† (55 lbs.) ..... **$ 719.00**
3/4 HP, 9.8 amps, 45 GPH, 2995 CFM w/30 ft. propulsion distance, for 230V/50Hz

HUMOSC (10 lbs.) ..... **$ 209.00**
360° Oscillator for Turbo Humidifans

HUMOSCE (10 lbs.) ..... **$ 269.00**
360° Oscillator for 230V/50Hz applications

5 Minute Interval Timer

Recommended for controlling fans, misting systems, pumps, and motors, this 5 minute interval timer activates for 3–4 seconds. Ten "on-off" switches are provided with each switch. Can be expanded to 120 trippers, thus capable of performing 60 "on-off" operations per cycle. 120 volts, UL & CSA listed.

TIM8855 (4 lbs.).....**$ 135.00**
Sets of 10 trippers **TIM8855T** (.1 lb.) .....**$ 2.95**

Humidity Sensors

Digital Thermohygrometer

A compact electronic device for measuring temperature and humidity in the laboratory or growroom, with a large, easy to read LCD digital display. While not as accurate as larger, more expensive analog or digital thermohygrometers, we recommend the **H0122** and use it in our own growrooms. Can be hand-held for spot checking of particular sites or set in a fixed location with the included wall mount. Measures 32–122 °F (0–50 °C) and 25–95% rH. Includes "Max-Min" controls for recording maximum and minimum levels for both temperature and humidity. Requires 2 AAA batteries (not included).

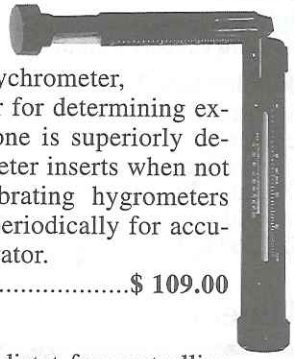
H0122 (1 lb.).....**$ 49.95**

Polythermal Professional Hygrometer

This hygrometer is quality crafted and guaranteed to be accurate to three percent rH upon shipment. A newly developed synthetic element gives this hygrometer far better response and accuracy over time than the old style spring, or paper hygrometers. Flange allows for easy wall mounting.

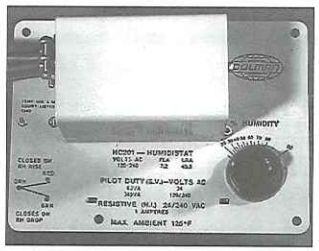
H7000 (2 lbs.).....**$ 119.00**

Sling Psychrometer



A practical, high quality sling psychrometer. This psychrometer, like others, uses a wet bulb and dry bulb thermometer for determining exact relative humidity and dew point. However, this one is superiorly designed for the protective case into which the thermometer inserts when not in use. Sling psychrometers are essential for calibrating hygrometers (please note that all hygrometers should be checked periodically for accuracy). Highly recommended for the professional cultivator.

SP7011(2 lbs.).....**$ 109.00**



HC201 Humidistat

This is an excellent humidistat for controlling rH, with a 10–94% range with a 3–5% humidity differential. Dial in the desired humidity and the HC 201 activates humidifiers to maintain the selected moisture level. The HC 201 becomes increasingly accurate at higher humidity. Adjustable, rated at 8 amps (42 start-up amps). Ready to wire. Simple instructions printed on face. Factory warrantied for 2 years.

HC201 (2 lbs.).....**$ 165.00**

XI. LABORATORY EQUIPMENT & SUPPLIES

The Complete Sterile Mushroom Culture Kit

We've assembled several high quality mushroom equipment packages that include the items most essential to starting cultures and creating spawn. With these kits you get all the equipment required, versatile equipment that you can use and reuse for years to come. As a helpful aid, we recommend the book ***Growing Gourmet & Medicinal Mushrooms***, which should be ordered separately. Each kit includes the following nine items:

1) An option for a pressure cooker/sterilizer
2) A thermo-hygrometer for measuring temperature and humidity
3) Alcohol lamp
4) Sleeve of 20 petri dishes
5) Scalpel
6) 1/2 lb. of nutrient-enriched agar media
7) Box of colorphast pH indicator strips
8) 50 synthetic filter discs for regular-mouth Mason jars
9) Your choice of a vigorous ***Agaricus brunnescens*** (Button), ***Pleurotus ostreatus*** (Oyster) or ***Lentinula edodes*** (Shiitake) culture

A Basic Kit with no pressure cooker (5 lbs.) **K300** .....**$ 229.00**
B Basic Kit with a 21 1/2 qt. pressure cooker (27 lbs.) **K400**† .....**$ 349.00**
(To order the Basic Kit B outside of the US, use Item Code **K400E**† **$ 349.00**)
C Basic Kit with a 41 1/2 qt. pressure sterilizer (48 lbs.) **K500**† .....**$ 499.00**
(To order the Basic Kit C outside of the US, use Item Code **K500E**† **$ 499.00**)
D Basic Kit with a 25 qt electric Steroclave (35 lbs.) **K600** .....**$ 579.00**
D Basic Kit for 230V/50Hz applications (35 lbs.) **K600E** .....**$ 599.00**

Fungi Perfecti's Ultimate Sterile Mushroom Culture Kit
This is truly the creme de la creme of sterile culture kits! Includes everything you need to stock your tissue culture lab:

Series III Laminar Flow Hood, featuring a 36 x 24" HEPA filter
25X Electric Steroclave
Bacticinerator II Scalpel Sterilizer for sterilizing culture tools
1000 ml Eberbach container and Waring Blender Base for liquid inoculation
7 x 7" Magnetic Stir Plate and 2000 ml. glass Erlenmeyer Flask
Professional scalpel with 10 scalpel blades
Case of 500 presterilized, disposable petri dishes
Twelve 200 x 25 mm. Master's size test tubes
Set of 100 Spawn Bags with Filter Patch for spawn incubation
Set of 24 1/2 gallon glass jars with autoclavable lids
Set of 30 110 mm Synthetic Filter Discs
1000 ml polymethylpentene Erlenmeyer Flask
250 ft roll of Parafilm for wrapping cultures
Digital Thermohygrometer for measuring temperature and humidity
box of 0–14 Colorphast pH Indicator Strips
1 lb. of Malt Extract Agar
50 lbs. of Certified Organic Rye Grain
And of course, your choice of a culture of ***Agaricus brunnescens*** (Button), ***Lentinula edodes*** (Shiitake) or ***Pleurotus ostreatus*** (Oyster) mushroom mycelium.

You would pay over **$ 3,500.00** for these components if you purchased them separately. We are offering them as a kit for a special price.
K2000† (375 lbs.).....**$ 3,150.00**
K2000E† for 230V/50Hz applications (375 lbs.).....**$ 3,275.00**

Prepared Culture Media, Media Components & Additives

Malt Extract Agar
Formulated especially for mycelium of the higher fungi to promote luxuriant growth. 50 grams of agar are recommended per liter of water.

1/2 lb. of Malt Extract Agar
(approx. 227 grams)
M100 (1 lb.).....**$ 22.95**
1 lb. of Malt Extract Agar
(approx. 454 grams)
M110 (2 lbs.).....**$ 32.95**

Visit us on the Web at www.fungi.com for the most up-to-date mushroom information, products and pricing!

24 Inch Compost Thermometer
Ideal for the recording of temperatures in multiple substrates. Features a 24 inch stem and 2 inch zoned dial. Range: 55–190°F (10–90°C) in 2° increments. Recalibratable.
TH2234 (.5 lb.).....**$ 16.95**

Electronic Substrate Thermometer
These are by far the best we've seen for the money. A fast response electronic thermometer 5 1/2 inches long. Accurate to within 1° F with a -40–212° F range, this pocket sized unit is well suited for on-the-spot measuring of substrate/soil temperatures. This hand held unit measures only 5.6 x 1.1 x .6 inches. Battery included.
THE60 (1 lb.).....**$ 59.95**

Quick-Set Max-Min Thermometer
An inexpensive, wall mounted max-min thermometer with centrally located press button reset. Range: -20–120° F.
TH5383 (1.5 lbs.).....**$ 19.95**

In-Line Fluid Thermometer
A 3 inch diameter dial thermometer for monitoring fluid (especially water) temperatures. Comes with a 2 1/2 inch long, 1/2 inch NPT fixed threaded stem. 20–240° F range.
TH5224B (1.5 lbs.).....**$ 84.95**

Thermostats

Single Stage Thermostat *(Pictured right)*
Contacts open on the rise for activating a device such as a heat exhaust fan. Operates between 40 and 110° F. Comes in a water-tight enclosure.
SST206 (2 lbs.).....**$ 69.95**

Double Stage Thermostat
Activating two devices, one on temperature rise, the other on temperature fall, this two stage thermostat is commonly used in growing environments for limiting temperature fluctuation. Operates between 30 and 110° F. Lower and upper limits can be set within 3° F.
SST207 (2 lbs.).....**$ 84.95**

Timers

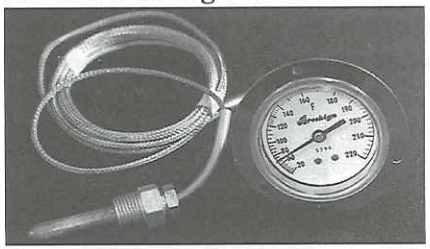
24 Hour/15 Minute Interval Timer
A well made 24 hour timer capable of 96 on/off functions per day. 20 amp capacity. Can be coupled with the **5 Minute Interval Timer** (described on the following page) if desired.
TIM1975 (4 lbs.).....**$ 145.00**

XII. GROWING ROOM EQUIPMENT & SUPPLIES

Thermometers

Digital Max-Min Thermometer
Ideal for measuring temperature flux indoors or out, this unit has a temperature range of -40–122° F, with memory function. Powered by a 1.5 volt AAA battery (included). An external sensor with a ten foot cord allows the remote registering of temperature differentials.
TH1220 (1 lb.).....**$ 42.95**

Remote Reading Thermometer



This durable, high-quality analog unit allows cultivators to read temperatures of growing rooms, Phase II chambers, and other sensitive environments from a remote location. Readings are unaffected by the ambient temperature surrounding the heavy copper, six foot long capillary sensor. Temperature range: 20–220° F.
TH5111 (1.5 lbs.).....**$ 99.95**

Aluminum Substrate Thermometer
A 13 1/2 inch, aluminum cased spirit-filled thermometer designed for insertion into soils, composts and other semi-solid materials. Temperature range: 10–240° F.
TH6011 (1 lb.) .....**$ 27.95**

Pocket Thermometer
An all-metal thermometer with a 1 inch dial for spot-checking bed temperatures. The 5 inch stem is just the right length for insertion into bulk substrates during spawn running and cropping. 25–125° F in 1° increments
TH5223A (.25 lb.).....**$ 16.95**
0–220° F in 2° increments
TH5223B (.25 lb.).....**$ 16.95**

Fungi Perfecti's Commercial Cultivation Equipment Packet that contains a comprehensive inventory/price list and suggested layout for a professional cultivation facility. Contact us for a free copy, or view the document online in the Mushroom Information Center on our Home Page at http://www.fungi.com

24 Inch Compost Thermometer
Ideal for the recording of temperatures in multiple substrates. Features a 24 inch stem and 2 inch round dial. Range: 40–160° F.

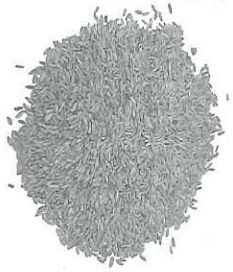
Fungi Perfecti's Ultimate Sterile Mushroom Culture Kit
This is truly the creme de la creme of sterile culture kits! Includes everything you need to stock your tissue culture lab:

FP's Antibiotic Malt Extract Agar Media
Our antibiotic media prevents bacterial growth while stimulating the growth of mushroom mycelium. For those who have experienced the disaster bacteria wreaks upon the spawn laboratory, this media is the solution. 50 grams are recommended per liter of water.
1/2 lb. of Antibiotic Malt Extract Agar (approx. 227 grams)
M205 (1 lb.).....**$ 34.95**
1 lb. of Antibiotic Malt Extract Agar (approx. 454 grams)
M230 (2 lbs.).....**$ 64.95**

Agar Agar
A non-nutritive derivative of seaweed that dissolves into and solidifies water. Our agar is individually assayed and is far superior to agars bought in most health food stores. 15 grams are recommended per liter of water.
1/2 lb. of Agar Agar (approx. 227 grams)
M200 (1 lb.).....**$ 39.95**
1 lb. of Agar Agar (approx. 454 grams)
M210 (2 lbs.).....**$ 59.95**

Peptone
Enhances mycelial growth of most saprophytic fungi. 100 gram bottles.
M400 (1 lb.).....**$ 17.95**

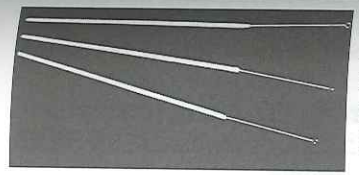
Organic Rye Grain
Experienced cultivators know the importance of grain quality to spawn production. We assure that our rye is the best available: few broken kernels, relatively free of extraneous debris, low in bacterial endospores, and recently harvested. Our rye is certified organic—free of any fungicides and/or pesticides. Sold in 50 lb. bags.



M700† (52 lbs.).....**$ 24.95**
M800† (2000 lbs.).....**$ CALL**

Uninoculated Plugs (Dowels) for Spawn Producers.
Birch dowels measuring 5/16 x 1 inch. Each dowel has spiral grooves, accelerating mycelial recovery from inoculation. 10,000 plugs per unit. To create spawn just soak for two days, sterilize, and inoculate with grain spawn. Each 1/2 gallon of grain spawn can inoculate 20 gallons of dowels or sawdust. (For pre-inoculated dowel spawn see pages 20–22.)
10,000 dowels **DOW381** (16 lbs.).....**$ 150.00**

Scalpels & Inoculation Tools



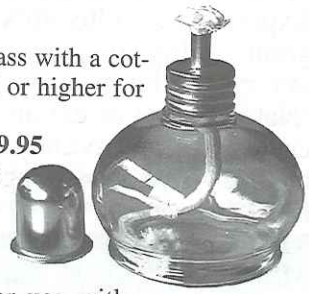
Inoculation Loops
A standard inoculation loop, with 6 inch insulated handle and 2.75 inch wire & loop. Ideal for streaking spores across a petri dish.
SC50 (.1 lb.) ..... **$ 4.95**

Full Spear Scalpel
A full spear headed, all-metal scalpel, perfect for use in mushroom tissue transfer for cutting agar media.
SC200 (.1 lb.) ..... **$ 7.95**

Professional Scalpel
Finally here is a device that can hold a blade long enough to get into the far recesses of test tubes. This imported 8 inch stainless steel scalpel is ideal for tissue culture, and can be fully inserted into 20 mm. diameter test tubes. A precision instrument of high quality. Comes complete with 10 disposable, snap-on knife blades.
SC300 (.25 lb.) ..... **$ 29.95**
Set of 10 replacement blades **SCB10** (.1 lb.) ..... **$ 4.95**

Scalpel Sterilizers

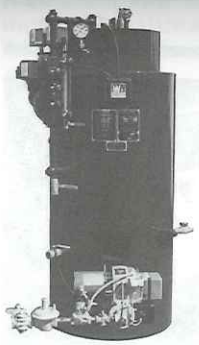
Alcohol Lamps
The standard laboratory alcohol lamp, made of thick glass with a cotton wick. Recommended for use with 70% isopropanol or higher for maximum effectiveness.
B100 (1 lb.)..... **$ 9.95**
Set of 3 spare wicks **B100W3** (.1 lb.)..... **$ 2.95**



Standard Bunsen Burner
A solid metal Bunsen burner for use with butane or propane gas. Comes with flame stabilizer and adjustable orifice.
B250 (.75 lb.)..... **$ 32.95**

Bacti-Cinerator III Scalpel Sterilizer
A standard in tissue culture laboratories throughout the world, the B-111 instantly sterilizes the transfer tool for use. Great for speedy transfers by cultivators whose work load pushes the limits of human endurance.
B111 (10 lbs.)..... **$ 299.00**
B111E (10 lbs.) for 230V/50Hz applications..... **$ 309.00**

Steam Generators



Gas-Fired Boilers
We access a broad line of heavy-duty steam boilers, and can provide custom quotations for any capacity or configuration you need. Gas boilers can be configured for either propane or natural gas; please specify when ordering. ASME/CSA certified.
6 HP Boiler (201,600 BTU) **VSB6**† ..... **$ 6,995.00**
10 HP Boiler (336,000 BTU) **VSB10**† ..... **$ 7,750.00**
15 HP Boiler (504,000 BTU) **VSB15**† ..... **$ 9,190.00**
25 HP Boiler (840,000 BTU) **VSB25**† ..... **$ 14,995.00**
Fungi Perfecti also offers electric boilers for either single- or three-phase current, in a wide range of capacities. Please contact us for a custom quotation.

Quick-Opening Autoclaves (Retorts)

Our line of autoclaves cost far below those of most manufacturers. They are constructed with 1/4 inch carbon steel, complete with safety blowouts, electrical interlocks, quick opening "spider" doors and 6 exhaust ports for gauges and chart recorders. Painted with high-heat aluminum and primer. Built to ASME requirements. Autoclaves are available with the option of one or two doors. Recommended operating steam pressure is 15–30 psi. From 6 to 30 feet long, from $4^{1/2}$ to 5 feet in diameter, these customized autoclaves make spawn, substrate, and/or canning commercially feasible. Each autoclave FP sells is custom manufactured to meet the specific needs of our customers. Allow 16–20 weeks for completion. Please contact us for a personalized quotation.

Batch Mixers

FP's 2 & 4 Cubic Yard Batch Mixers
These versatile mixers are destined to become the centerpiece of any mid-size mushroom farm. The Mushroom Mixers are powered by a 10 or 20 HP motor that drives a heavy duty paddle agitator and companion auger for lateral mixing. An adjustable discharge gate coupled with a interval timer allows the production manager to allocate volumes of media directly into containers. A water line with hose bib adapter is mounted for precise introduction of moisture using a timer. The central shaft allows the injection of steam and a swivel fitting is provided for steam input. The cover is hinged and the entire shell is insulated. A separate interval and full cycle timers standardize the mixing process. Comes complete with remote reading thermometer. 6 inch casters mounted on 4 leg-stands allow maximum mobility. After rigorous testing and improvements, the Mushroom Batch Mixers can process 2000 (2 cubic yard mixer) to 4000 (4 cubic yard mixer) bags of substrate per day! Allow 6–8 weeks for delivery. Please call for shipping quotes.
MBM20L† (2600 lbs.)..... **$ 22,995.00**
MBM40L† (4200 lbs.)..... **$ 26,495.00**

Test Tube Brush
A 9 inch long brush with 3 inch china bristles for easy cleaning of test tubes.
TB93 (.1 lb.) ..... **$ 3.95**

Parafilm
An elastic wax-like film that can be stretched to seal petri dishes and test tubes. Very useful, measuring 2 inches by 250 feet. Many cultivators wrap individual culture dishes, once inoculated, to prevent the entry of contaminants along the periphery. We highly recommend this procedure for beginners and for anyone who frequently experiences the havoc wreaked by airborne contaminants.
PF250 (2 lbs.) ..... **$ 27.95**

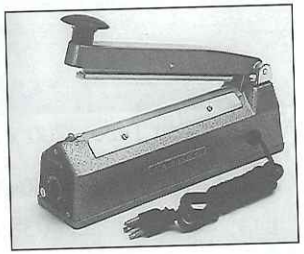
Spawn Incubation Bags & Accessories

Spawn Bags With Filter Patch
A custom-made, autoclavable, gusseted spawn incubation bag complete with a microporous filter patch that allows gas exchange but prevents the passage of contaminant spores. Dimensions: 21 x 8 x 4 3/4 inches (a full 3 inches longer than most). These bags are widely used by mushroom growers throughout the world.
Sets of 10 **SAB010** (1 lb.) ..... **$ 8.50**
Sets of 100 **SAB100** (7 lbs.) ..... **$ 75.00**
Sets of 1000 **SAB1000**† (56 lbs.) ..... **$ 425.00**
Sets of 5000 **SAB5000**† (280 lbs.) ..... **$ 1500.00**

Autoclavable Bags
Heat tolerant, non-gusseted bags for sterilization of spawn media or other materials. Also excellent for bulk substrates such as chopped straw or sawdust. Sold in sets of 10.
12 x 24 inch **APB1224** (.25 lb.) ..... **$ 5.00**
24 x 30 inch **APB2430** (.5 lb.) ..... **$ 10.00**

Non-Autoclavable Bags
A three-dimensional, non-autoclavable bag. Great for growing out spawn on straw, wood chips or other bulk substrates. Measures 30 x 12 x 8 inches. Sold in sets of 10.
PB3012 (.25 lb.) ..... **$ 4.00**

Impulse Sealer
An excellent sealer, well-suited for use with sterile airflow spawn bags (**SAB**s). Provides a seal up to 12 inches wide in approximately 1 second. This unit is an essential tool for the airtight sealing of bags used in the manufacture of sawdust/bran blocks.
IS100 (12 lbs.) ..... **$ 225.00**
Replacement elements (sets of 4 with 3 Teflon insulators)
IS100RE (1 lb.) ..... **$ 59.95**
Replacement Teflon insulators
IS100RE2 (1 lb.) ..... **$ 7.95**



The **IS100E** is an Impulse Sealer for 230V/50Hz applications.
IS100E (12 lbs.) ..... **$ 229.00**
Replacement kit for the **IS100E** (contains 2 heating elements and 2 Teflon insulators)
IS100ERE (1 lb.) ..... **$ 12.95**

All American Pressure Cookers
These solid aluminum pressure vessels are by far the highest quality made. The exclusive metal-to-metal seal means that there are no rubber gaskets to replace. 21.5 quart liquid capacity can hold 7 quart jars for sterilizing media. (**Please note:** these pressure cookers are not for use in food preparation!) Each cooker comes with a rack and an instruction booklet.

All American Pressure Sterilizers
The All American Pressure Sterilizers differ from the Pressure Cooker in several ways that make them better tools for the mushroom cultivator. A stopcock prevents steam from being emitted once sterilization temperatures have been achieved; this means that they require less monitoring than the Pressure Cooker. These units also feature a capillary tube and a removable solid insert basket.

The 25-X All-American Electric STEROCLAVE
The 25-X is a self-contained, gasketless pressure sterilizer, complete with heating element, thermostat, and indicator light. Popular with cultivators, doctors, and laboratories worldwide. This 25 quart sterilizer is preferred by many professional tissue culturists. Highly recommended for processing culture media. Includes removable solid insert basket.
25X† (35 lbs.) ..... **$ 529.00**
25XE† (35 lbs.) for 230V/50Hz applications ..... **$ 549.00**

FP's Pressure Cookers/Pressure Sterilizers

Item Code	Quart Capacity	Qt. Jar Capacity	Weight	Inside Diameter	Inside Height	Outside Height	Price
PCS921†*	21.5	7	24 lbs.	12.25 in.	10 in.	16.75 in.	**$ 169.00**
PCS1925X†*	25	7+	26 lbs.	12.5 in.	13.5 in.	19 in.	**$ 259.00**
PCS1941X†*	41.5	19	42 lbs.	15.25 in.	15 in.	19 in.	**$ 349.00**
25X†	25	7	30 lbs.	12.5 in.	13.5 in.	19 in.	**$ 529.00**
25XE†	25	7	30 lbs.	12.5 in.	13.5 in	19 in.	**$ 549.00**

*These models do not come equipped with a heating element.

Visit us on the Web at www.fungi.com for the most up-to-date mushroom information, products and pricing!

Miscellaneous Culture Supplies

Shoe Shields
Reusable 20 gauge elastic weave shoe covers that can be stretched over street shoes to protect laboratory environments from contamination by footwear. Made of a synthetic fabric that breathes to reduce heat build-up. Since 99% of all contaminants are within one foot of the floor, shoe protection significantly reduces risk from this source. One size fits all.
Per pair **SSH20** (.1 lb.) ..... **$ 2.49**

"Dust" Filter Masks
Cotton filter masks that protect workers against airborne spores and/or dust. Disposable and lightweight. Boxes of 50. Essential for indoor growing environments where concentrations of spores occur.
DFM50 (1 lb.) ..... **$ 12.95**

Wash Bottle
An essential item for any laboratory, this versatile plastic wash bottle makes dilutions and cleanup easy.
WB100 (.5 lb.)..... **$ 4.95**

Iodophor™ Contact Sterilant
A remarkable sterilant widely used by the beer, wine and fermentation industries to disinfect glassware, vessels, utensils and other surfaces. Only 2 ounces of Iodophor™ are needed for every 5 gallons of water. Highly effective. 1 gallon.
ICS1000† (10 lbs.)..... **$ 22.95**

Decontamination "Sticky-Mat" Floor Pads
Primarily used for the laboratory, each package contains 30 peel off mats. Since 99% of all contaminants are within one foot of the floor, the contamination vector that footwear poses is substantial. You can reduce this risk through the use of these tacky mats. When you see the amount of debris they remove from your feet, you'll come to appreciate their usefulness. We have also found another use: by incubating your cultures on a decontamination pad, mites and other mobile organisms are prevented from travelling from one culture to another. Hence, these mats can also work to limit cross-contamination between cultures. We strongly recommend trying them. Dimensions: 18 x 45 inches.
Sets of 30 **DFP30** (4 lbs.)..... **$ 49.95**
Case of 120 **DFP120** (16 lbs.)..... **$ 159.00**

BIOLOGICAL EFFICIENCY

Biological Efficiency is a term frequently used in the mushroom industry to describe yield potentials of mushrooms from various agricultural by-products (straw, sawdust, sugar cane bagasse, banana fronds and coffee plant wastes, to name a few). This formula was first developed by the Button mushroom *(Agaricus)* industry.

Simply put, a yield of 1 lb. of fresh mushrooms from 1 lb. of dry substrate is considered to be 100% Biological Efficiency. Since mushrooms are approximately 90% water and the base substrate is typically raised to 75% moisture, 100% Biological Efficiency is equivalent to saying that 25% of the wet mass of the substrate is converted into fresh mushrooms.

Although such yield efficiencies are commonly achieved by experienced growers, many choose not to "chase the optimum", as their growing rooms can be better utilized by cycling in fresher material.

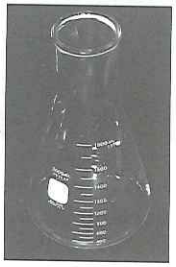
A 9 inch long brush with 3 inch china bristles for easy cleaning of test tubes.
TB93 (.1 lb.) ..... **$ 3.95**

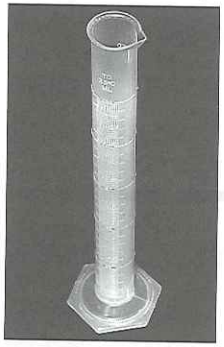
Liquid Media Containers & Accessories

Autoclavable Plastic Flasks
Transparent straight-neck flasks made of unbreakable polymethylpentene. Available in 500 and 1000 ml. sizes.
500 ml. **AF500** (.5 lb.)..... **$ 19.95**
1000 ml. **AF1000** (1.25 lbs.)..... **$ 24.95**

Erlenmeyer Media Flasks
Clear, autoclavable, chemical-resistant media flasks. Made of durable polymethylpentene and equipped with a screw-on closure. Ideal for sterilization and pouring of agar media. Available in 500 and 1000 ml. sizes.
500 ml. **EF500** (.5 lb.) ..... **$ 29.95**
1000 ml. **EF1000** (1.25 lbs.) ..... **$ 34.95**

2000 ml. Glass Erlenmeyer Flask
This large 2000 ml. autoclavable glass Erlenmeyer Flask with 100 ml. graduations is ideal for liquid fermentation of mycelium as described in ***Growing Gourmet and Medicinal Mushrooms***.
EFG2000 (5 lbs.)..... **$ 49.95**





Graduated Cylinders
Graduated cylinders are especially useful for insuring the accuracy of measurement "scoops" used in the repetitive making of spawn and for the accurate dispensing of liquids. Made of autoclavable polypropylene, these cylinders are available in 2 sizes.
500 ml. with 5 ml. graduations
GC500 (.75 lb.) ..... **$ 24.95**
1000 ml. with 10 ml. graduations.
GC1000 (1.25 lbs.)..... **$ 29.95**

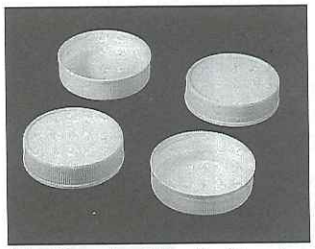
Non-Absorbent Cotton
A 1-lb. roll of pure white medical-grade non-absorbent cotton. Useful for covering the opening on media flasks during sterilization of agar or liquid fermentation as described in ***Growing Gourmet and Medicinal Mushrooms***.
NAC100 (1 lb.) ..... **$ 24.95**

We recommend that tissue culturists dip the handles of all scalpels in a liquid rubber product like Plasti Dip®. Doing so not only allows one to maintain a secure grip on the scalpel, it helps to insulate the scalpel handle (and hence the cultivator) against the heat of sterilization. Liquid rubber dips are available at most hardware stores.

Autoclavable Jars & Lids

Autoclavable Glass Jars
Clear glass autoclavable jars, ideal for the incubation of grain spawn. Can be fitted with 110-mm. Synthetic Filter Discs (available on Page 43). Complete with autoclavable screw-on closure (when using a filter disc, a 3/8 inch diameter hole should be drilled or melted through each. Melting recommended—**always use caution when working with flame**). Available in half gallon and 1 gallon sizes, in sets of 24 and 16, respectively.

1/2-gallon Glass Jars with Lids, sets of 24
GJ100 (50 lbs.).....**$ 54.95**
1-gallon Glass Jars with Lids, sets of 16
GJ200 (50 lbs.).....**$ 44.95**

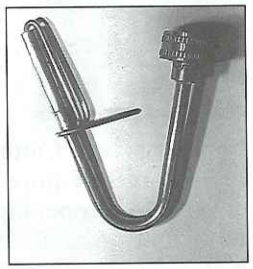


Autoclavable Plastic Lids for Spawn Jars
These one piece lids are ideal for use in spawn production and are superior to metal canning lids in that they will not rust or warp. A 3/8 inch diameter hole should be drilled or melted through each (melting recommended for 110 mm. lids—**always use caution when working with flame**) and a filter disc inserted underneath to allow contaminant-free air exchange. Color: various.

For Regular Mouth Canning Jars
Sets of 10 **LQM70/10** (2 lbs.).....**$ 6.95**
Sets of 100 **LQM70/100** (5 lbs.).....**$ 49.95**
For 1/2 Gallon and 1 Gallon Jars
Sets of 10 **LQM110/10** (3 lbs.).....**$ 7.95**
Sets of 100 **LQM110/100** (8 lbs.).....**$ 59.95**

Bottle Washers

Inversed Bottle Washer
This unit is yet another example of the fact that simplicity can be the true genius of a design. This all-brass device features a pressure-sensitive one-way valve that is activated when a jar or bottle is brought up to it. Attaches to a standard kitchen faucet. Especially useful in the cleaning of test tubes or small spawn bottles.



IVB100 (1 lb.).....**$ 12.95**
Faucet adapter for (attaches by removing the aerator from your kitchen faucet)
IVB101 (.1 lb.).....**$ 2.95**

Fungi Perfecti offers a Commercial Cultivation Equipment Packet that contains a comprehensive inventory/price list and suggested layout for a professional cultivation facility. Contact us for a free copy, or view the document online in the Mushroom Information Center on our Home Page at http://www.fungi.com

pH Testers

Colorphast pH Indicator Strips
Non-bleeding, tri-color strips that give accurate measurements of acidity/alkalinity in increments of .5 pH points. Far superior to roll type pH paper. 100 strips each.

pH range 0-6 **PH060** (.1 lb.).....**$ 14.95**
pH range 5-10 **PH510** (.1 lb.).....**$ 16.95**
pH range 0-14 **PH014** (.1 lb.).....**$ 19.95**

Pocket pH Pen
A pocket sized sensor that electronically reads and displays pH values via a Liquid Crystal Display with an accuracy of 1/10th of a pH point. Measuring only $5^{1/2}$ inches in length. Battery life: 1000 hours. Adjustable. Warrantied for 6 months. Buffer/Standard (pH 7.01) should be ordered separately.
PH100 (1 lb.).....**$ 64.95**
500 ml. pH Standard
PH701 (1 lb.).....**$ 9.95**

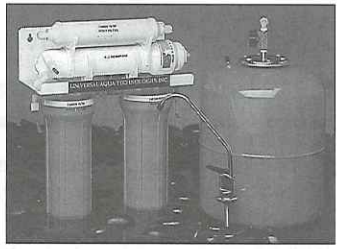
Moisture and Acidity Meter
This remarkable unit simultaneously reads the moisture content and pH of the substrate into which it is inserted. It is especially useful for composing the casing soil and for insuring maximum primordia formation. Effective range: pH 4–pH 9.
PH200 (1 lb.).....**$ 109.00**

Professional Digital pH Multi-Meter
This device represents a true breakthrough in accuracy and affordability in the testing of media (please note: not for use as a soil tester). Capable of assessing pH levels from 0–14 in increments of .01 with an accuracy of ± .01 pH. Also measures millivoltage from 0–1999 in increments of 1 mV (accuracy ±1 mV) and temperature from 0–100°C in increments of 1°C (accuracy ± 1°C). Easy-to-read Liquid Crystal Display offers both digital and analog readout of data. Automatic one- or two-point calibration to standard 4, 7 & 10 pH buffers. UL/CSA/FCC listed.
PH320 (6 lbs.).....**$ 649.00**
PH320E (6 lbs.) for 230V/50Hz applications.....**$ 699.00**

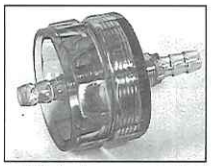
5 Micron Sediment Filter System
A 5 micron filter membrane removes all visible particles from water including rust, iron, silt, dirt, and scale, at a flow rate of 1–10 gallons per minute (GPM). The PVC filter housing has a standard 3/4 inch inlet and outlet, making for easy installation. Filter cartridges are replaceable. Comes with 1 cartridge.
WLF1000 (5 lbs.) ..... **$ 39.95**
Replacement 5 micron filters **WLF1005** (2 lbs.) ..... **$ 5.95**

High-Volume 5 Micron Sediment Filter System
For more demanding water filtration needs, this 1–40 GPM 5 micron filter system is ideal. Fits both 3/4 and 1 inch water lines. Comes with 1 cartridge.
WLF2000 (8 lbs.) ..... **$ 84.95**
Replacement 5 micron filters **WLF2005** (2 lbs.) ..... **$ 12.95**

Three-Stage Reverse Osmosis Filtration System



We have investigated water filtration systems for several years. After considerable study, we are convinced that reverse osmosis systems offer the most filtration efficiency for the money. This system utilizes water pressure ranging from 40–60 psi. Three in-line filters are employed. The first stage, the prefilter, screens out particulates down to 5 microns. The second stage, utilizing an extremely fine pored semi-permeable membrane, results in truly contaminant free water—free of bacteria, all organic pesticides, herbicides, fungicides, PCB's and other industrial pollutants. This highly purified water is then passed and stored in a 3.2 gallon storage tank. The final stage has a post-filter, using activated carbon to remove any residual gases or chlorine. Finally the water is dispensed through its own spigot. At normal operating pressures, 10 gallons of pure water is generated per day. Shut-off is automatic when the reservoir tank is full. This system is easy to install and clearly is a fantastic buy. Warrantied for 1 year. Buying bottled water seems exorbitant when you can generate better quality water at home. All materials are FDA approved. Highly recommended.
WRO1000† (35 lbs.) ..... **$ 329.00**
Replacement 5 micron prefilter (should be changed every 6 months)
WRO-PF1 (2 lbs.) ..... **$ 11.95**
Replacement activated carbon postfilter (should be changed every year)
WRO-PF2 (2 lbs.) ..... **$ 16.95**
Replacement reverse osmosis filter membrane (should be changed every 3–4 years)
WRO-OF (5 lbs.) ..... **$ 79.95**



In-Line Micron Filters
Designed for in-line filtration of liquids or gases—particularly useful for *in vitro* laboratory experiments. Holder is made of tough, transparent polycarbonate, so assembly can be checked and filtration can be observed. Unit can be used for either vacuum or pressure filtration. Unscrew unit to insert 47 mm. membrane, which is supported on both sides by polypropylene plates. Biologically inert silicone 0-ring seals the membrane and prevents bypass. Removable tubing connectors on either end fit 3/8 inch I.D. tubing. Holder with membrane is fully autoclavable. Overall length, including tubing connector: 100 mm. (nominal). Diameter 65 mm. (nominal).
LFH6527 (1 lb.) ..... **$ 79.95**
Replacement filters (.2 micron, 47 mm. diameter, sets of 10)
LF2347 (.1 lb.) ..... **$ 29.95**
Replacement filters (.45 micron, 47 mm. diameter, sets of 10)
LF4547 (.1 lb.) ..... **$ 29.95**

Microscopes & Accessories

The Nova Model 920
Binocular Laboratory Microscope
A high-power microscope ideal for the professional mycological laboratory. Capable of magnification from 40X to 1000X (oil immersion). Features include an integrated, graduated mechanical stage with conveniently positioned X–Y controls, 360° rotating optical head, precision coaxial coarse/fine focus controls and a built-in 20-watt quartz halogen lamp. Powerful, precision crafted, and comfortable to use.
MIC920† (30 lbs.) ..... **$ 1,100.00**

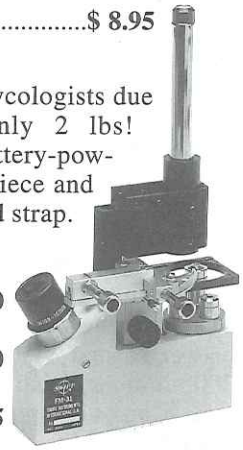
Camera Adapter for the Nova Series Microscopes
"T" type adapter attaches to one eyepiece of the Nova series Binocular Microscopes. Comes with 4X photo eyepiece. Please specify camera type when ordering this product.
MIC920AC (2 lbs.) ..... **$ 99.95**

Immersion Oil
An environmentally safe, non-drying immersion oil for 1000X microscopy. 2 fluid ounces. Comes in a plastic bottle with built-in dropper
MICI0 (.25 lb.) ..... **$ 15.95**

Glass Slides
Precleaned glass microscope slides, measuring 25 mm. x 75 mm. x 1 mm. thick. 72 slides per box.
MICGS (.5 lb.) ..... **$ 11.95**

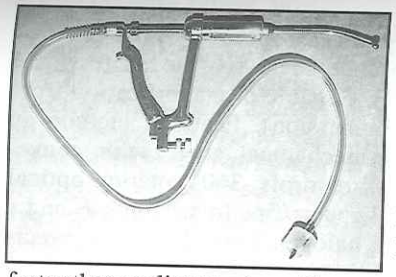
Glass Cover Slips
Optically clear glass cover slips measuring 22 mm. x 22 mm. Number 1.5 thickness. 138 slips per box.
MICCS (.1 lb.) ..... **$ 8.95**

The Swift Portable Field Microscope
This hand-held microscope is popular with professional mycologists due to its precision craftsmanship and light weight—only 2 lbs! Illumination is provided by daylight or by the included battery-powered incandescent lamp. Comes complete with a 10X eyepiece and 4, 10 and 40X lenses, illuminator, integral carrying case and strap. Available with or without phase contrast.



Without Phase Contrast
MIC31 (4 lbs.) ..... **$ 749.00**
With Phase Contrast
MIC31PC (4 lbs.) ..... **$ 979.00**
Blue Filter—Recommended!
MIC31BF (.1 lb.) ..... **$ 19.95**

ORDER LINE: (800) 780-9126 • PHONE: (360) 426-9292
FAX: (360) 426-9377 • email: mycomedia@aol.com



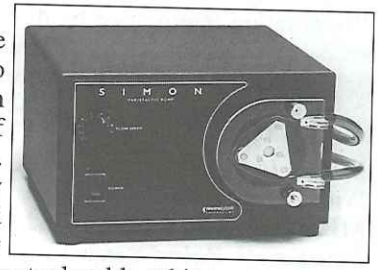
FP's Back-Filled 2–20 ml. Inoculation Gun
A *substantial* improvement in performance, quality, and price is achieved with this newest version of the pistol grip syringe gun. This stainless steel gun allows the pumping of sterile liquids or suspended mycelia in 2–20 ml. strokes. Perfect for spawn generation techniques that call for drawing mycelia from a remote reservoir and then transferring it to sterilized media. Much faster than earlier versions. Comes with a $2^{1/2}$ foot long vinyl tube. Autoclavable. (We recommend pairing this unit with our Eberbach blenders/stirrers.)
IG220 (3 lbs.) ..... **$ 79.95**
Glass Barrel replacement and gasket/"O" ring set
IG220GB (.25 lb.) ..... **$ 14.95**

Inoculation Needles
13 gauge, large-bore needles for liquid inoculation of spawn. (Void where prohibited by law. Not for human or animal use.)
$3^{1/2}$ inch long straight needle **IN312** (.1 lb.) ..... **$ 7.95**
$3^{3/4}$ inch long heavy-gauge, dual opening needle **IN334** (.1 lb.) ..... **$ 9.95**

Inoculation Plungers (Syringes)
Plastic, autoclavable. (Void where prohibited by law. Not for human or animal use.)
30 cc. **IP30** (.1 lb.) ..... **$ 4.95**
60 cc. **IP60** (.1 lb.) ..... **$ 6.95**

Rubber Latex Sheeting
This latex allows penetration by a needle and closes upon retrieval. It is recommended for those designing containers for growing spawn inoculated via the syringe/liquid inoculation method. Sheets measure 12 x 12 inches.
RLS12 (.2 lb.) ..... **$ 9.95**

Manostat Varistaltic® Pump
The Manostat Pump is designed to aid in the transfer of sterile liquids from one vessel to another. A versatile and efficient pump that can save valuable time in the repetitive process of mass liquid culture fermentation and inoculation. The flow rate can be adjusted almost infinitely between 1 and 3450 ml/minute (we recommend 300 ml/minute, and provide tubing for this flow rate). Comes complete with 10 feet of 5/16 inch autoclavable tubing.



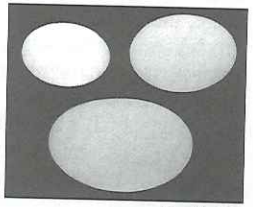
MLP300 (11 lbs.) ..... **$ 750.00**
MLP300E (11 lbs.) for 230V/50Hz applications ..... **$ 775.00**

Fungi Perfecti's Laser Particle Counter
A remarkable money-saving instrument that provides an accurate assessment of airborne contamination. Measuring to .3 microns, this hand-held unit samples air in 1/10 of a cubic foot in one minute, using a built-in laser to detect quantities of pathogen sized particles. (Laser life expectancy: 30,000 hours) Ideal for not only measuring clean-room integrity and scanning HEPA filters, the Laser Particle Counter is exceptional in its usefulness for tracking vectors of contamination. This portable unit has a rechargeable internal battery which allows for 3.5 hours of continuous operation. Paul Stamets notes "This is the single most valuable tool I have used in nearly 20 years of tissue culture."

LPS229 (10 lbs.) ..... **$ 2295.00**
LPS229E (10 lbs.) for 230V/50Hz applications ..... **$ 2595.00**

Synthetic Filter Discs

To be used separately or in conjunction with one piece lids, these filters fit neatly within the rim and allow air exchange but prevent contaminant spores from entering. Sterilizable and reusable for life. (Not for food canning.) 99.97% efficient at .3 microns. Available in sets of 10 and 100.



For regular mouth canning jars (70 mm. in diameter)
Sets of 10 **SFD70/10** (.1 lb.) ..... **$ 9.95**
Sets of 100 **SFD70/100** (1 lb.) ..... **$ 44.95**
For wide mouth canning jars (90 mm. in diameter)
Sets of 10 **SFD90/10** (.1 lb.) ..... **$ 11.95**
Sets of 100 **SFD90/100** (1 lb.) ..... **$ 54.95**
For 1/2 gallon and 1 gallon glass jars (110 mm. in diameter)
Sets of 10 **SFD110/10** (.1 lb.) ..... **$ 13.95**
Sets of 100 **SFD110/100** (1 lb.) ..... **$ 64.95**
For 2.5 or 4 gallon glass jars (125 mm. in diameter)
Sets of 10 **SFD125/10** (.1 lb.) ..... **$ 15.95**
Sets of 100 **SFD125/100** (1 lb.) ..... **$ 74.95**

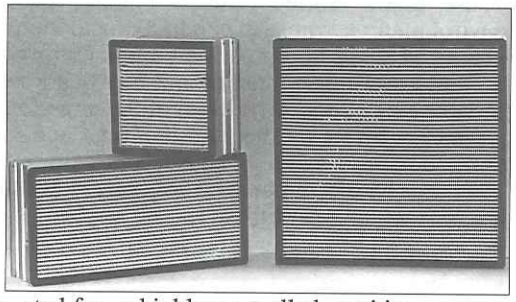
Water Filters, Inline Filters & Accessories

Coarse Particulate Line Strainers
These are low-pressure-drop filters that effectively filter out suspended sediments from water systems using a # 40 mesh removable screened basket. Made of high impact nylon. Female threaded. Maximum pressure 100 psi. Housing white except for 1/2 inch unit, which is clear.

1/2 inch **WLS50** (1 lb.) ..... **$ 20.95**
3/4 inch **WLS75** (1 lb.) ..... **$ 22.95**
1 inch **WLS100** (1 lb.) ..... **$ 24.95**
$1^{1/2}$ inch **WLS125** (2 lbs.) ..... **$ 29.95**

Air Filtration

Micron Filters



Custom manufactured to FP's critical specifications, these scanned water-resistant high efficiency particulate air (**HEPA**) filters represent a breakthrough in quality and price. Filters are stocked in six sizes and screen out all airborne contaminants down to **.3 microns** with a guaranteed efficiency of **99.99%**. Our micron filters are individually **scanned** and tested for quality. Coupled with an appropriately rated fan, a highly controlled, positive pressurized, sterile environment can be created within the laboratory or growing room. These filters are used in the construction of laminar flow hoods throughout the microbiological industry. They are also employed by computer manufacturers, nuclear laboratories, survivalists, allergy sufferers, photographers, and many others with requirements for clean air. All filters constructed with water-resistant media.

FP's Micron Filters

Dimensions	Item Code	Weight	Price
12 x 12 x 5.8 inches	**MF1212**	9 lbs.	**$ 89.95**
24 x 12 x 5.8 inches	**MF2412**	11 lbs.	**$ 129.95**
24 x 18 x 5.8 inches	**MF2418**	15 lbs	**$ 159.95**
24 x 24 x 5.8 inches	**MF2424**	19 lbs.	**$ 229.95**
36 x 24 x 5.8 inches	**MF3624†**	22 lbs.	**$ 289.95**
48 x 24 x 5.8 inches	**MF4824†**	40 lbs.	**$ 349.95**

A new generation of filters, called **ULPA**'s, are also available. They filter airborne particulates down to .1 microns with a **99.999%** efficiency. This efficiency exceeds the practical needs of most tissue culturists but we welcome inquiries. We can custom quote any **HEPA** or **ULPA** filter to your specifications.

Electrostatic Air Filters

A cleanable, replaceable electrostatic filter that screens out contaminants down to 1 micron with a **99%** efficiency. These filters are especially applicable for primary air filtration into sterile laboratories and/or growing rooms. (They are, however, not recommended as a component for a laminar flow hood as filter efficiency is inadequate. HEPA filters are rated at a much higher order of efficiency, **99.99% at .3 microns**. This difference is significant.) Installing an Electrostatic Air Filter at the "upstream" end of your laboratory or grow room air filtration system can add years of life to your HEPA filters. Dimensions: 22 x 21 x 7 inches. Efficiency is optimized at 1000–1200 CFM. Pressure drop rated at .23 inches at 1200 CFM.

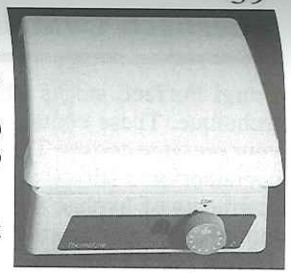
EAF2221 (50 lbs.).....**$ 449.00**
EAF2221E (50 lbs.) for 230V/50Hz applications.....**$ 529.00**

Coarse Prefilters

These 20 x 25 x 2" pleated filters are an effective "first line of defense" in your air filtration system. Filters airborne contaminants with 30% efficiency.

CPF3030 (2 lbs.).....**$ 9.95**
Case of 12 **CPF3030/12** (24 lbs.).....**$ 109.00**

Magnetic Stir Plate



This stir plate is well suited for most culture purposes. Working surface measures 7 x 7 inches. Comes complete with 100–1000 rpm speed control and a magnetic stir bar.

MSP122 (8 lbs.).....**$ 249.00**
MSP122E (8 lbs.) for 230V/50Hz applications.....**$ 279.00**

Deluxe Magnetic Stir/Hot Plate

Fungi Perfecti also offers a 7 x 7 inch combination stir/hot plate. Capable of 60–1000 rpm and 100–700° Fahrenheit.

MSP125 (10 lbs.).....**$ 499.00**

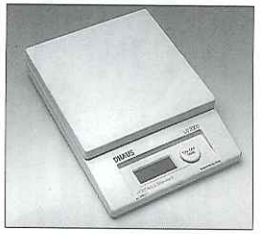
Floating Stir Bar

This is the stir bar that laboratory technicians dream about! Ingenious design greatly increases stirring efficiency.

FSB100 (.1 lb.).....**$ 38.95**

Scales

Ohaus Portable Digital Scale



This versatile, portable electronic scale is ideal for use anywhere an accurate scale is required. 2000 gram capacity in 1 gram increments, with an easy-to-read Liquid Crystal Display. Features a large weighing platform, Low Battery indicator and Auto-Off. Operates on a single 9-volt battery (not included) or an optional AC adapter.

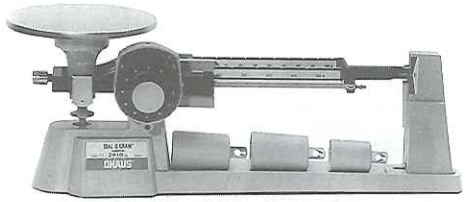
LOG1000 (6 lbs.).....**$ 129.00**
AC Adapter **LOG1000AC** (2 lbs.).....**$ 24.95**
AC Adapter for 230V/50Hz **LOG1000ACE** (2 lbs.).....**$ 49.95**

The Acculab Digital Scale

More sensitive than the **LOG1000**, the Acculab weighs up to 400 grams with an accuracy of 1/10 gram. Digital display. Six month warranty. Powered by included AC adapter or by a 9 volt alkaline battery (not included).

ACC400 (6 lbs.).....**$ 155.00**

The Dial-0-Gram 1650



The Dial-0-Gram Professional Balance Scale accurately weighs to within 1/100 of a gram, up to 1650 grams.

DOG1650 (18 lbs.).....**$ 225.00**
Poly Scoop for dispensing of media
DOG1625 (2 lbs.).....**$ 12.95**

Ohaus Advanced Portable CT Scale

Preferred by laboratories around the world, this professional digital scale has a 200 gram capacity with .01 gram increments. Items are weighed upon a 3 inch stainless steel platform. Powered by an included AC adapter or 8 AA batteries (not included). Complete with calibration weights and dispensing scoop.

LOG2000 (6 lbs.).....**$ 599.00**

Eberbach Containers

Fungi Perfecti stocks **Eberbach containers** for devotees of the liquid inoculation technique. These containers are autoclavable. Partially fill with water, autoclave in your pressure cooker. Transfer an entire dish of mushroom mycelium into it. Place the container on a stirrer, activate, and in five seconds or less there are millions of tiny fragments of hyphae which can be transferred into sterilized grain. This technique minimizes contamination, accelerates colonization, maximizes the potential of your mycelia, and tremendously speeds up the inoculation/incubation process. The cultures and time you save will more than make the cost worthwhile. One culture grown on a 100 x 15 mm. petri dish can effectively inoculate 100–300 cups of grain using these stirrers! In fact, some mushroom species grow too slowly via the traditional methods of propagation, and defeat would-be spawn makers. With these stirrers, mycelium of difficult-to-grow species can be expanded quickly and efficiently. In our opinion, these stirrers are integral to any professional spawn laboratory.

250 ml. Eberbach Container

This is an all-stainless-steel Eberbach container, fitted with an airtight lid.
EB250 (2 lbs.).....**$ 199.00**

500 ml. Eberbach Container

An all-glass container, featuring a screw-on metal cover and stainless steel blades. (**Note:** the manufacturer suggests that this unit be autoclaved unassembled. All-metal containers can be autoclaved assembled.)
EB500 (3 lbs.).....**$ 169.00**

1000 ml. Eberbach Container

An all-stainless-steel container, equipped with a 1/2 inch diameter airtight sampling plug that is perfect for the insertion of a syringe or pipette with minimal risk of contamination. Comes with a threaded cover. We highly recommend this unit.
EB1000 (6 lbs.).....**$ 439.00**

Waring High-Speed Blender Base

This is a durable, single-speed, professional quality blender base designed for use with the 250, 500 and 1000 ml. Eberbach containers. 20,000 rpm, consumes 360 watts.
WB700 (10 lbs.).....**$ 139.00**
WB700E (10 lbs.) for 230V/50Hz applications .....**$ 229.00**

Visit us on the Web at www.fungi.com for the most up-to-date mushroom information, products and pricing!

Laminar Flow Hoods

These finely crafted desktop laminar flow hoods produce a localized sterile environment in which to conduct inoculations without danger of airborne contamination. Made of imported 9-ply birch hardwood. A powerful fan pushes air through a .3 micron filter, screening out nearly all spores or contaminants. Each filter has been scanned centimeter by centimeter and is fully guaranteed. The cost of a hood is quickly offset by the cultures, time and money saved. These hoods have been designed specifically for mushroom culture by a practicing mushroom cultivator. They can be offered at such low prices because we are the manufacturers. Hoods are in stock at most times.

The Series I Laminar Flow Hood

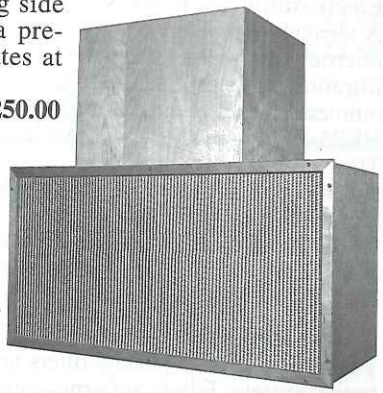
FP's least expensive Laminar Flow Hood now comes pre-assembled! All you need for final assembly is a length of electrical cord for the fan, a screw driver and caulking gun. This unit comes complete with a scanned, 99.99% efficient 24 x 12 inch HEPA filter, fan, 5-ply birch housing, screws and brass handles. Ideal for "on the road" tissue culture or for use in small clean-room environments. For those who have a limited budget, the **Series I** is uniquely affordable.
LFHI† (42 lbs.).....**$ 450.00**
LFHIE† (42 lbs.) for 230V/50Hz applications.....**$ 475.00**

The Series II Hood

Our popular deluxe hood conserves space while filtering airborne contaminants down to .3 microns with 99.99% efficiency. Complete with prefilter housing. These units are currently in use by government laboratories, professional spawn laboratories, and home cultivators in this country and abroad. Employs a scanned 24 x 18 inch HEPA filter. Comes with a prefilter assembly and universal fan that operates at both 115V/60Hz and 230V/50Hz.
LFHII† (90 lbs.) .....**$ 950.00**

The Series III Hood

The Series III is a professional hood for the serious mushroom grower. Utilizing a 36 x 24 inch scanned 99.99% micron filter, the **Series III** provides enough room for two tissue culturists working side by side. This two-station hood comes with a pre-filter assembly and a universal fan that operates at both 115V/60Hz and 230V/50Hz.
LFHIII† (120 lbs.).....**$ 1250.00**



NEW! The Series IV Hood

Our new top-of-the-line Hood features a 48 x 24 inch scanned 99.99% efficient micron filter, maximizing your sterile work area. Comes complete with a prefilter assembly and a powerful 1/2 HP blower.
LFHIV† (180 lbs.).....**$ 1600.00**
(**Note: LFHIII** and **IV** cannot be shipped via UPS. Please call for shipping rates.)

ORDER LINE: (800) 780-9126 • PHONE: (360) 426-9292
FAX: (360) 426-9377 • email: mycomedia@aol.com

Appendix B:

Total Cost for Implementation

Component	Cost
Labor (183.25 hours)	$0.00 (donated)
Logs (Alder)	$0.00 (donated)
Logs (Tan Oak)	$10.00
Plug Spawn	$113.00
Rope	$15.00
Signs	$20.00
	$138.00

Appendix C: Mushrooms for CCAT Web Page

Mushrooms for CCAT

This semester (Fall 2001), there will be a new addition to CCAT – mushrooms!

A team of three HSU students, with the help of community volunteers, has begun work on a mushroom garden on the CCAT grounds. Heavy shading and a moist environment have made a recently cleared patch of land ideal for mushroom cultivation.

The Goal

The goal of this project is to cultivate approximately 50 pounds of edible mushrooms for consumption by CCAT Co-directors and guests by Spring 2006.

The Site

Initially, the site of the mushroom cultivation was cleared to make room for a bamboo grove. When only part of that land was used for actual bamboo growth, it was decided that a mushroom garden would be most suited to the area, as mushrooms thrive in shaded, moist environments. This application honors CCAT's dedication to appropriate and efficient use of resources. The site is located between CCAT's bamboo grove and bamboo structure.

Some Dietary Benefits of Edible Fungi (Mushrooms)

Edible fungi (mushrooms) are a good source of protein and contain all of the essential amino acids, making them a better meat substitute than most legumes and vegetables. Some mushroom species contain B vitamins as well as vitamins C, K, and E, and most are rich in potassium and phosphorous. Mushrooms contain very little fat, are high in dietary fiber, and can be prepared in a wide variety of ways. As a food crop, mushrooms can enhance the self-reliance of the campus community by offering a nutritious, popular, locally-produced meat alternative to enrich a varied, well-balanced, and eco-friendly diet.

The Procedure

Mushrooms grow in/on a variety of substrates, including straw, fertilizer, and wood. For this project, the four varieties of mushrooms selected thrive on hardwoods (decompose them for nutrients). Alder and Tan Oak logs will be used to grow Shiitakes, Oyster Mushrooms, Chicken of the Woods, and Lion's Mane mushrooms. Figures 1-4 are pictures of the four varieties. (Pictures appear courtesy of Fungi Perfecti.)

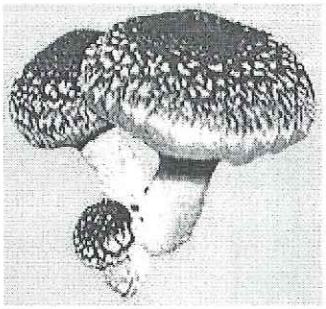


Figure 1: Shiitakes

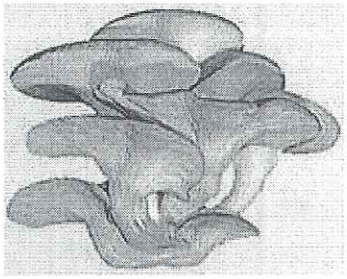


Figure2: Oyster Mushrooms

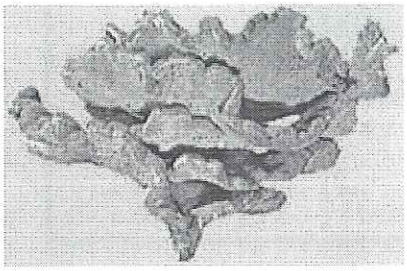


Figure 3: Chicken of the Woods

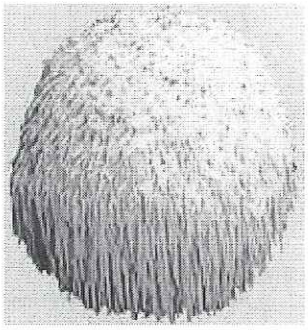


Figure 4: Lion's Mane

The logs will be cut and set to rest for one month as naturally occurring anti-fungal compounds within the logs decompose. After this wait, the logs will have between 50 and 70 holes drilled into them. Next they will be infused with plug spawn (mycelia, or mushroom "seeds") purchased from Fungi Perfecti, an Olympia, Washington-based company specializing in gourmet and medicinal mushrooms. Figure 5 is a picture of the plug spawn, or wooden dowels coated with mushroom mycelia (courtesy of Fungi Perfecti). Figure 6 is a diagram of the plug spawn infusion process.

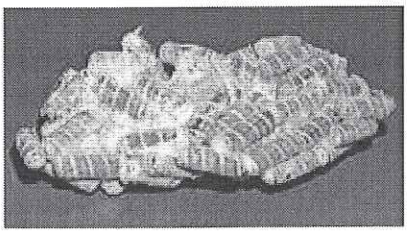


Figure 5: Plug Spawn

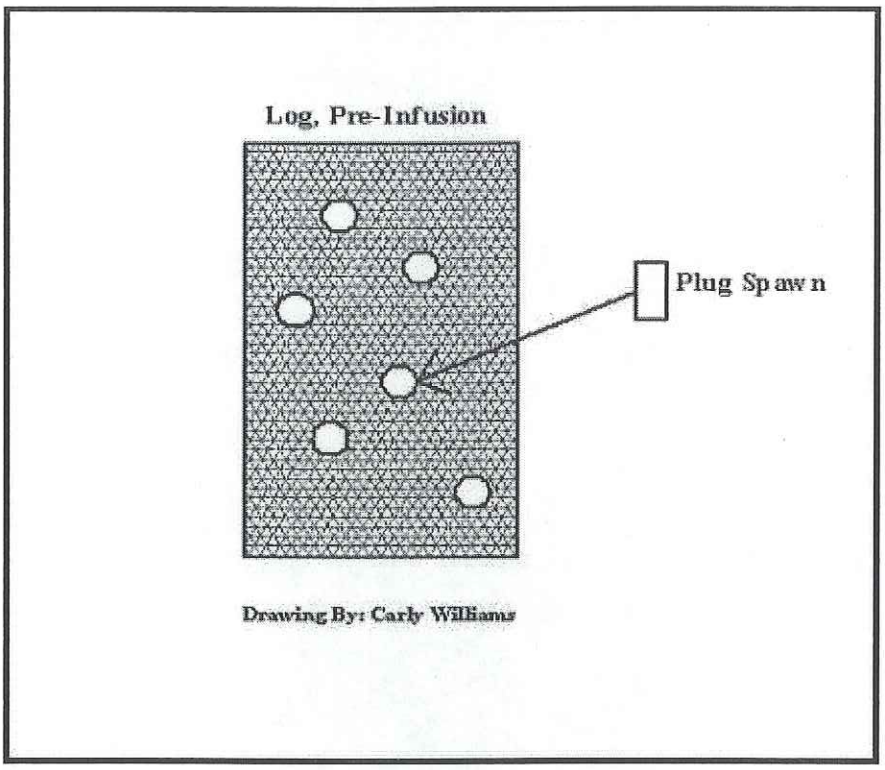


Figure 6: Plug Spawn Infusion

Finally, the plugs will be sealed with wax. At this time, fungal filaments called hyphae will "colonize" the log. In several months, edible reproductive structures (mushrooms) will emerge!

Questions and Comments

Questions and comments are always welcome. If you have any about this project or this web page, please contact:

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Information

For more information about mushrooms and mushroom cultivation, please contact:

www.FungiPerfecti.com

References and Suggested Reading

- www.FungiPerfecti.com