Shiitake Mushrooms – A New Forest Product ?

Over the past few years, a tremendous interest has developed in Michigan around the fresh, edible mushroom known as Shiitake (Say Shee-ta-kay). These meaty-tasting fungi are a product of the Orient. In fact, Shiitake (latin: Lentinus edodes) is considered one of Japan's largest agricultural exports. Most of the Shiitake imported into this country comes in dried form, which is reconstituted with water before cooking.

Why is fresh-grown Shiitake of interest to forest landowners in Michigan? Because this edible mushroom can only be grown on hardwood logs such as oak, beech, ironwood and others. (Note: it is possible to grow Shiitake artificially on wood chip medium. However, only the log method will be discussed here.)

Growing Shiitake allows forest landowners a new opportunity to utilize low-grade and/or small diameter trees thinned out of their woodlots. Therefore, it offers a short-term payback for long-term management of woodlands, whether that means extra cash from selling mushrooms or just using the mushrooms produced for your own use.

Traditionally, demand for this mushroom in fresh-form has exceeded its supply in North America. Excess demand, coupled with high retail prices for fresh mushrooms ($4 - $12 per pound), is what usually gets people interested in growing Shiitake from a commercial standpoint. However, some people prefer to grow Shiitake only for their own use because of this mushroom's appeal as a gourmet or natural food. In either case, the first step is to learn all about how to grow the Shiitake mushroom or risk failure.

Essentially, the process to grow Shiitake involves cutting live hardwood trees in late winter/early spring into about 3 foot lengths and inoculating them with the Shiitake mushroom fungus "spawn" shortly thereafter.

Spawn is available either as impregnated wood plugs or as impregnated sawdust. Plugs are a little more expensive to purchase, but are easier to use (i.e. only requires a hand drill and mallet to inoculate) and won't dry out or perish quickly. In comparison, sawdust spawn is more economical to purchase and somewhat faster to inoculate with but requires the use of a special inoculation tool and can quickly dry out if not handled carefully.

To inoculate logs with either type of spawn, a series of holes must first be drilled over the entire length of the log. The next step is to then insert the wood plug or sawdust into each hole. Finally, each inoculation site as well as the ends of each log should be lightly covered/coated with melted wax to prevent the spawn and logs from drying out.

Once the logs are inoculated, they can then be stacked on the ground with one end raised slightly in a shady, unexposed area to incubate. In the Midwest, maintaining a high moisture

content is the key to successfully growing Shiitake. Stacking close to the ground helps maintain log moisture but occasionally logs should be soaked for 48 –72 hours at a time during the incubation period. This will prevent logs from drying out, which can cause the fungus to go dormant or even die.

When soaking logs, a light sprinkling of the surface usually is not adequate. Serious-minded Shiitake growers often devise a system (can range from garbage cans to livestock watering troughs) where logs can be completely immersed. Soaking logs in cold water is also an excellent way to trigger fruiting later on, therefore it makes sense to devise a good means of soaking logs from the start.

After about a year, (depending upon weather conditions, mushroom strain and a few other factors) the Shiitake will begin to fruit. If not triggered by forced soaking, Shiitake typically fruit naturally during the spring and fall after periods of heavy rain and/or high humidity.

Logs will continue to fruit for 3 – 4 years once production begins, with peak production in about the second year. However, the production life depends upon how often the logs are forced to fruit. Obviously each log has only a certain amount of wood tissue that will sustain the fungus. Once this "food" in the wood is "consumed" by the Shiitake fungus, the log will cease to bear.

How many mushrooms can a person expect to produce? This is a very difficult question to answer as it depends upon the wood species being used, the strain of the fungus, how well the producer tended his/her logs and other factors. In addition, not every log will produce mushrooms as some logs never "take" because other fungi contaminate the log or producers fail to maintain the proper moisture content. However, a very variable rule-of-thumb would be to estimate that a cord of wood (such as red or white oak) might yield 75-100 pounds per year over a 4 year lifetime.

What are the costs to grow Shiitake? Shiitake spawn can be purchased for about $20 - $35/500 wood plugs (about 50 plugs/log). Drill, drill bits, mallets, wax, and other tools/materials are also needed to complete the operation. Other equipment or material for soaking and stacking logs upright for fruiting may also be needed. Producers must also keep in mind that the relatively low cost of production tends to be offset by the large amount of labor involved to harvest trees, cut-to-size, inoculate, stack, soak, re-stack and more over the course of the production cycle.

In addition, there's much more that needs to be learned to perfect the production process and to analyze market conditions. There are only a few places where any Shiitake research id being performed and access to current information may be difficult or proprietary. So, people eager to grow Shiitake (especially commercially) should thoroughly learn and think through what's involved.

Selecting Shiitake Spawn for Inoculation

Change has been rapid in the Shiitake industry in the United States over the last few years. While improvements have been made in the production process, change has been most evident in the area of spawn selection.

For Michigan, the basic recommendation for new producers is to choose several strains (varieties) of spawn at first to see which one(s) will do best in your area and under your conditions. Remember, temperature for fruiting, species of wood, micro-climate and other factors all will influence how a strain will perform over time.

Other guidelines in selecting spawn include choosing a strain that will tolerate colder temperatures in the spring for fruiting – especially in Northern Michigan. Also, be sure to choose strains that will perform well under the drier, less humid climate that exists in Michigan as compared to the West Coast.

Therefore, it may be best to start with spawn suppliers in the Midwest to see what strains of Shiitake they find to be successful under Midwest conditions. It also pays to shop around for spawn, just like most other items you purchase.

New strains are constantly being introduced that incubate and fruit more quickly and have other desirable characteristics. However, it is difficult to make recommendations about which strains of Shiitake do best in Michigan since most suppliers use proprietary names for their strains that make it difficult to compare from one dealer to another.

However, many suppliers offer what they call warm weather strains, cold weather strains, and wide ranging strains. This refers to the temperature conditions in which the Shiitake fungus will produce mushrooms. New growers may want to consider purchasing at least one wide ranging strain at first to help cover any possible situation. Other strains can then be chosen based on fruiting temperatures or other characteristics such as color or cap size.

Growers should also keep good written records that document the strains used and how successful these strains performed over time in order to determine which strains do best under his/her individual conditions. Good records enable growers to make better informed spawn purchases in the future as well as other improvements in their operation.

Contact various spawn suppliers to see what they have to offer. Although more risky, some of the new strains are bound to be more successful (i.e. productive) than older strains as suppliers continue to refine the development of Shiitake spawn. Try it, you may like some of the new ones!!!

Shiitake Mushroom Resources – 1993

Shiitake Growers Associations

Alabama Shiitake Growers Assn.
Hosea Hall
Cooperative
Extension Service
Alabama A & M University
819 Cook Ave.
Normal, Alabama 35762
205/532/1697

Alternative Agricultural
Cooperative Association
Don Reid,
PO Box 1266,
Sedalia, MO 65302
816/827/0884

Appalachian Mushroom Growers
Association
Maryellen Lombardi,
Rt 1 Box 30 BYY
Haywood, VA 22722

Arkansas:
Those persons who are
interested in forming a growers
association should contact:
Tom Kimmons
Rt #, Box 15
Shirley, AR 72153

Carolina Exotic Mushroom Assn.
Ellie Litts
Route 2, Box 284
Hodges, SC 29653

Florida Mushroom Growers Assn.
Charlie Tarjan
3426 S.W. 75th Street
Gainesville, FL 32607

Geodo Shiitake Producers
Irene Nelson
4809 Avenue O
Ft. Madison, IA 52627
319/753/6143

Minnesota Cultivated Mushroom
Association
Wally Mattson
2718 Shilhon Road
Duluth, MN 55804

Northwest Shiitake Association
Ken Pingei
PO Box 207
Salem, OR 97308

SHI-GAW (Shiitake Growers
Association of WI)
John Cook
PO Box 99
Birchwood, WI 54817
715/354/8171

Midwest Specialty Mushroom
Growers Association
(MN, WI, IA, IL, and MO)
Joe Krawczyk
N3296 Kozuzek Road
Peshtigo, WI 54157
715/582/4997

Canada
Canadian Mushroom Growers
Association
310-1101 Prince of Wales Drive
Ottawa, Ontario K2C 3W7
Canada

<u>Spawn/Equipment Suppliers</u>
Allied Mushroom Products
PO Box 490
Tontitown, AR 72770
501/361/5938

Far West Fungi
PO Box 1333
Goleta, CA 93116

Field and Forest Products, Inc.
N3296 Kozuzek Road
Peshtigo, WI 54157
715/582/4997

Fungi Perfecti
PO Box 7634
Olympia, WA 98507
206/426/9292

Hardscrabble Enterprises
Rt 6, Box 42
Cherry Grove, WV 26804
304/358/2921

LF Lambert Spawn Co
PO Box 407
Coatesville, PA 19320
215/384/5031

Mushroompeople
Box 220
Summertown, TN 38483
612/964/2200

Mycotek
7421 Pudding Creek Drive S.E.
Salem, OR 97301
503/370-7674

Northwest Mycological
Consultants, Inc.,
702 N.W. 4th Street
Corvallis, OR 97330
503/753/8198

Sohn's Oak Forest Mushrooms
PO Box 20
Westfield, WI 53964
608/296/2456

J.B. Swayne Spawn, Co.,
PO Box 618
Kennett Square, PA 19348
215/444/0888

Won Shan Mushroom Farm
Rt 1, Box 510
Catlett, VA 22109
703/788/1127

Canada
Western Biologicals LTD
Box 283
Aldergrove, British Columbia
VOX 1AO Canada
604/856/3339

<u>Shiitake
Demonstrations/Research
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Arkansas
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Minnesota
The Shiitake Mushroom
Demonstration Project
Doreen Bergo, Project Mgr.
Forest Resource Center
Rt 2, Box 156A
Lanesboro, MN
507/467/2437
Tours available by appointment.

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