



*The first shiitake mushrooms appeared one and a half years after inoculation.*

# Growing Mushrooms

—Ulf Kintzel

*Photos by Author*

This is the article I was looking forward to writing for more than a year. Always on the lookout for something else to do on the farm, other than raising sheep, I stumbled across this rather accidentally when I read in a farming magazine about the possibility of growing mushrooms.

When I was growing up, we gathered wild mushrooms often, becoming quite good at identifying mushrooms. These included those that were look-alikes with poisonous mushrooms, with only a little difference differentiating the edible ones from the ones that could kill you.

Mushrooms already have many benefits before you eat them. The walk in the woods, the smell of decaying lumber and leaves, the beauty of fall-colored leaves, the joy of finding a cluster of brightly-colored chanterelles peeking through the moss and needles of a pine forest, or finding the majestic King Bolete among the fallen leaves of a stand of beech and maple trees—all that is certainly good for one's well-being. Once the wild mushrooms are gathered and cleaned, they are best prepared fried in butter with onions. And, looking at the health benefits of mushrooms, you'd think you are never going to die if you eat them regularly! No, really, the health benefits are so numerous that listing them all would go well beyond the scope of this article.

My mushroom gathering years are now a matter of the past, and I have not been able to do the same here in America. Finding edible mushrooms in our woods on the farm has been disappointing, although we have years with plentiful meadow mushrooms and some horse mushrooms growing in the pasture.

So what is the next best thing after gathering mushrooms? Growing them! There are various methods of growing various kinds of mushrooms. Growing them on wooden logs was the most intriguing way to me since it replicates nature the most. And I figured that a mushroom growing on a log must surely benefit from all the minerals and elements in that log—minerals and elements I hoped to harvest with the mushroom.

Where to start? That was the biggest hurdle and I simply did a search on the Internet. A company called “Field and Forest Products” in Wisconsin ([www.feldforest.net](http://www.feldforest.net), 800-792-6220) seemed to be a good source. The website gave me a lot of information, including “How-to” videos, and their catalog is also very detailed and informative. Questions arose in the process and although my first order was not at all substantial (I spent just \$170), they were kind enough to answer all my questions. Just to be clear, I have nothing at stake here and have no benefit of any sort by mentioning them. I just thought they are worth mentioning since for me it was the perfect place to go to as a beginner, especially since these first steps are so difficult.

Winter is a time when I have some time to spare. Two winters ago their catalog became one of my favorite reading materials. I settled on growing shiitake and oyster mushrooms. There are different strains of shiitake mushrooms: wide range, warm weather, and cold weather strains. Within each strain you have three or four different varieties. Confusing enough? Oh, don't worry. It is so much fun going through the catalog over and over again, trying to decide which variety of which strain to choose, thinking it is a major decision while in the end the differences are probably marginal anyway. I settled

for a variety of each strain in the hopes that this would extend the growing season, hoping that one strain would grow at any given point in time during the season. There are fewer strains available for oyster mushrooms and I went with two proven strains and avoided—for now—the ones that were rather unique.

The logs for growing mushrooms need to be cut during dormancy. They need to be fresh lumber and not logs of already dead or fallen trees, which are likely to be infested by other fungi and microorganisms already. The logs should be 40 inches long and about four to six inches in diameter. I cut a few logs with a wider diameter, and while six inches still works well, eight inches in diameter makes it more difficult for hardwood logs to be handled, especially when trying to force-fruit mushrooms. Different kinds of mushrooms require different kinds of wood. All of this was nicely outlined in the very comprehensive catalog. Shiitake mushrooms grow best on hardwoods like oak and maple. I ended up using mostly sugar maple for my shiitake mushrooms as well as some cherry just because of availability. Oyster mushrooms, on the other hand, grow best on various kinds of poplar, aspen, and cottonwood. While inoculating the logs, I learned a few things I did not know before about these trees. Did you know that a cherry log smells like a ripe cherry when you drill holes into it in the midst of winter? And did you know that trembling aspens, which I used for the oyster mushrooms, always grow in clusters since they are growing from the same root, making them a cluster of clones? Well, I didn't before I started this enterprise but I do now.

There are various ways of inoculating the logs with spawn. I chose plug spawn, which can be tapped into holes drilled into the logs. The holes are drilled about six inches apart in a



*The inoculated logs are put on pallets during incubation to reduce risk of other fungi occupying the logs.*

diamond pattern, which maximizes the number of holes. The depth of each hole has to be exactly the same as the length of the plug. A stop collar attached to the drill bit proved invaluable to master this task. Once the holes are drilled and the spawn plugs are tapped into the holes, they get covered with wax in

order to keep them from drying out.

While doing this I found out that it is crucial for the wax to be warm. That was not an easy task in the middle of winter. I used a heating pad to keep the wax on the verge of becoming a liquid. Lastly, an aluminum tag gets attached to each log and the name of the strain as well as the inoculation date was “written” on it or, better said, engraved in it.

I then stored the inoculated logs on pallets, first inside, then outside. I made the mistake of keeping the logs moist the following spring by submerging them in water every 6 to 8 weeks. This is actually something you do to force-fruit them later on but not something that is done during the incubation time. Since my logs didn't fruit I sent off an e-mail to Field and Forest Products. They responded back by saying that the logs have to dry out first before they fruit and that keeping them moist keeps the mushrooms in a vegetative state.



*Harvesting the mushrooms as part of family fun*

For fruiting purpose the logs are put either upright or in a fruiting stack. I simply put a board in between two cut-off sugar maples and leaned the logs against it. They are placed in a young stand of sugar maple trees providing shade and behind a large pile of cut brush providing shelter from harsh



*The harvest. The bigger ones made good fried mushroom sandwiches.*

Now it was becoming a waiting game with frequent checking, with false excitement when some bark had peeled off and looked like an emerging mushroom. However, the logs dried out eventually and did start fruiting. It was quite some joy collecting the first shiitake mushrooms. Our whole family of five gathered around for the harvest, embracing the new addition to our homegrown foods. The first mushrooms we just fried in the pan. It turns out that this is not the best use for shiitake mushrooms, while it works well for oyster mushrooms. So what else can you use

the shiitake mushrooms for? I literally dreamed up a recipe. While I was asleep I dreamed that we stuffed one of our homegrown pasture-raised chickens with a mixture of wild rice and shiitake mushrooms and, shortly before the chicken was fully baked in the oven, added more mushrooms to the juices in the frying dish. So we did. Out came a very delicious chicken. The shiitake mushrooms had clearly put a distinct mark on the flavor. Could it be that I had come across such a recipe in some magazine at some point and my subconscious made me dream about it? Perhaps. For now I will hold on to the thought that I dreamed up this recipe since my family loved it so much.



*Chicken with Shiitake Mushrooms: The things I dream about at night...*

After the initial fruiting, some strains, especially the warm weather strains of shiitake mushrooms, can be force-fruited. The logs must be submerged in water for 24 hours every eight weeks or so. I used a stock-water tank for this purpose.

Oyster mushroom logs are spent rather fast, after

three years or so, while shiitake mushroom logs can fruit for quite a few more years, so I was told. To stay in the game, I decided to inoculate a few more logs every two years. These two years are up since my initial attempt of growing mushrooms. This winter I will start growing three different kinds of mushrooms. I will grow yet another variety of oyster mushrooms, one that will also fruit in the spring. I will also

try growing a mushroom called

boxelder, which indeed grows on boxelder logs. Lastly, I intend to try growing an Asian mushroom called Nameko, which is said to grow well on cherry logs. I will get this one as well and will enjoy the smell of ripe cherries in the middle of the winter when I drill the holes for the plugs into the cherry wood. So by the time you read this article you know exactly where I am and what I buried my nose in...

If you, dear reader, expected me to write about sheep again

in this issue and were disappointed, don't worry, in the next issue I will talk about sheep again. Just once in a while I'd like to wander and share the many wonders a farm has to offer, be it birds or be it mushrooms. And if you are interested in sheep, be sure not to miss my advertisement near this article. I'll be coming to Ohio next spring. This could be your chance to get some grazing genetics

of grass-fed White Dorper sheep onto your farm. 🐑

*Ulf Kintzel is a native of Germany and lives in the U.S. since 1995. He farms in the Finger Lakes area in upstate New York. Ulf owns and operates White Clover Sheep Farm. He breeds and raises grass-fed White Dorper sheep without any grain feeding and offers breeding stock suitable for grazing. His website address is [www.whitecloversheepfarm.com](http://www.whitecloversheepfarm.com). He can be reached by e-mail at [ulf@whitecloversheepfarm.com](mailto:ulf@whitecloversheepfarm.com) or by phone at 585-554-3313.*