

Growing Mushrooms— What I Have Learned

—Ulf Kintzel

A few years ago, I wrote an article about growing shiitake and oyster mushrooms. Since then, I gained a few new insides and learned from my mistakes and failures. These new experiences are the topic of this article. Just know, I am by no means an expert mushroom grower; just somebody who shares his experience.

We are a family of enthusiastic mushroom hunters and eaters. Just in the last two years we found several bumper crops of horse mushrooms, maitake, honey mushrooms, chanterelles, blewits, oyster mushrooms, various boletes, and meadow mushrooms. We go mushroom hunting often. Growing mushrooms therefore came naturally to me.

To recapture the beginnings, I started out with shiitake on sugar maple and red oak logs and oyster mushrooms on trembling aspen logs. I used the plug spawn to inoculate the bolts, the way it was recommended for newbies.

I was somewhat pleased with my early shiitake production, but the oyster mushrooms were a failure. I could not figure out why until somebody who was growing mushrooms told me on Facebook that plug spawn doesn't work well for oyster mushrooms and that I should try the totem method instead. A look at his son's farm's Facebook page seemed to confirm that this was somebody who knew a thing or two about mushroom growing. Three years ago I went to a lecture by Cornell University, where I received more information on oyster mushroom cultivation. At that meeting it was also stated that

the totem method is a more successful way of growing oyster mushrooms. I had shied away from this method since it seemed more complicated and more work. I was mistaken. After putting the first few smaller totems together, using trembling aspen logs in most cases and sugar maple in some, I asked myself why I hadn't tried this earlier. It was easy and it was fast. I made some little variations because I found the suggested method too cumbersome. Particularly, this meant that I substituted the paper at the bottom of the totem with a slice of wood and put the first layer of sawdust spawn in between

this slice and the piece of log, rather than setting the log inside the plastic bag on top of the paper with saw dust. I also used a few deck screws to fasten the different layers back together rather than letting them fuse together over time while the mycelium was growing. These two changes allowed me to easily move the totem after inoculation into the bag. It also allowed me to move the bag with the log more easily around. I used small white garbage bags on my short totems. The totems consisted of a two-inch slice at the bottom, followed by a sixteen-inch log, and topped again with a two-inch slice on top. These are approximate figures. Some of the two-inch slices ended up a little thicker. In between I put the sawdust span, which made it two layers of spawn. The bag is about two feet high, which allowed me to cover the top when the totem was set into the bag. Instead of using a rubber band, I stapled the top of the bag to the top of the totem, another little tweak of the instructions. This allowed me to easily determine how much



The Golden Oyster fruits in the summer and impresses with both the color and its aroma.

opening I left, something that is necessary to allow for some airflow. I put all of these 12 little totems in my basement, where I have a pretty steady temperature and where the mycelium could continue growing throughout the winter months. The first surprise came a few short weeks later. The oyster mycelium invaded these logs very aggressively and fast. White mycelium had grown all over, including the inside of the plastic bags, clearly visible from the outside. I was hopeful that I would see mushrooms in the coming year.

The varieties I used were Po-Hu and Golden Oyster. The Po-Hu oyster fruits in the spring and fall, and the Golden Oyster in the summer. I repeated the totem method with another set of Kira and Italian Oyster the following year. Kira is a cold weather “cousin” to Po-Hu and the Italian Oyster is a more delicate variety, whose stems are edible also. The success rate was reasonable. The Po-Hu especially turned out to be a prolific producer, fruiting various times of the year. I tried one more variety, called Polar White. This variety fruits exclusively in the fall, which appeared to put limits on the expected yields. It turned out that this variety was my most prolific oyster strain. I contributed it to the season it fruits, which was rather late in the fall when a lack of humidity is no longer an issue. In fact, it was so late that I took the remaining totems that had started fruiting into the basement because hard frost was in the forecast. In between my home-grown oyster mushrooms and the ones we found in the wild, we had as many meals as we desired and ended up freezing another dozen bags for meals in the winter.

Oyster mushroom logs and totems don’t produce as long as shiitake logs do. It is recommended to inoculate new ones every two years. I find great entertainment value in growing these mushrooms, so inoculating new totems won’t be a problem. I have plenty of trembling aspens on my farm. I won’t run out of suitable trees anytime soon.

I made changes to my shiitake production as well. I tried the drill-and-fill method, using sawdust spawn instead of plug spawn. At first I thought it would be too involved. Wrong again. This method went so much faster. It did require a few additional purchases before I could start. First, a wider drill or hex bit is needed, so I had to buy that. Secondly, an inoculator tool is necessary. There is one available that is designed to be operated with the palm and one that is operated with the thumb. I was advised that the thumb-operated one can also be operated with the palm, but the palm-operated one cannot be operated with the thumb. Therefore, the thumb-operated one is the better choice. Good advice! I purchased that one for \$35. In addition, I opted for cheese wax instead of plug wax to seal the inoculation sites. Here too an investment of a temperature-controlled deep fryer was needed to warm up the wax. I purchased a cheap one for less than \$40 at Walmart. The heated wax will then be applied with wax daubers instead of the thumb. The daubers are cheap and add only a few dollars to the bill. I figured over time these extra



Submerging the logs in cold water for up to 24 hours is called force fruiting and leads to shiitake growing shortly thereafter.



Fruiting Shiitake strain WR 46. The white fruiting blanket to the right covered the logs for most of the time to keep the air around them humid.



Freshly inoculated sugar maple logs, stacked in the shady woods for incubation.

costs will pay for themselves. There were two major changes because of this new method. First, it went much faster to inoculate, as well as seal the inoculation sites, compared to using plug span and plug wax. The second change was even more significant. Previously, I used a bag of 250 count plug spawn, which inoculates approximately five to six logs, depending on length and width. The cost at that time was \$20 per bag. However, a bag of 5.5 lbs. of sawdust spawn cost only four dollars more at that time (\$24), but inoculated 20 and more logs of the same size.

The past couple of years I have stuck to the most commercially productive and most researched variety, which is the wide range shiitake strain

WR 46. A close relative is a strain called West Wind, which is another variety I used. Both varieties respond very well to force-fruiting. Last spring, I ventured into a cold weather variety called Miss Happiness. This way I hoped to extend my harvesting season into the late fall. The incubation time of this cold weather strain was quite a bit longer than WR 46 and West Wind, but it did exactly what I had planned: it fruited at a much colder time later in the season and then again early in the spring.

I tweaked a few details as well. One is the length of the logs. I reduced the previously used length of my logs by about two inches to 40 inches. They now fit better in my livestock troughs and I fit more of them when I force-fruit. I also no longer use logs that are seven

and eight inches in diameter. They are too clumsy to move around and just too heavy for my sons to lift after soaking them in water. I stuck to logs that are four and five inches in diameter, with the occasional log being six inches in diameter. This size, four to five inches in

diameter and 40 inches long, is very handy. Also, I gave up looking for (and wasting) red oak logs. Why? Because I have a whole grove of young sugar maple, which is just as suitable and has the added advantage of providing an abundance of straight logs with few branches. Last but not least, shiitake mushrooms are good for several years. So I don't have to inoculate new ones for several years.

In the catalogue from Field and Forest (www.fieldforest.net) (800) 792-6220),

whose products are in my view the best in the whole country and which I use exclusively, is a page that talks about what to do with mushrooms when you have too many and wish to preserve them. In previous years I skipped over that page, thinking "Yeah, that's not gonna happen." Well, it did in 2018. My logs of WR 46 and West Wind produced so many mushrooms that it took hours and hours to harvest and process them. Of course, I made another mistake, which was that I force-fruited all of them at once, not anticipating the incredible flush of mushrooms that popped up. For subsequent harvests I force-fruited smaller numbers of logs. After eating many meals of shiitakes, we preserved so many more that I now have a whole big box of small freezer bags full of shiitakes in my freezer. Shiitakes freeze so incredibly well when slightly sautéed that you can hardly tell the difference when compared to fresh ones.

So, if you wish to get started on mushrooms, just call Field and Forest and order their free catalogue. It is incredibly resourceful and gives you enough information to get started. When you order spawn, you will also receive an instruction sheet which gives you further guidance.

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



Polar White is a strictly fall fruiting oyster mushroom.

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