



RESIDENTIAL LOT-TURNED-SMALL-FARM YIELDS PRIZED PRODUCE

Couple solving multiple mushroom mysteries in busy backyard

Tony Hoch

Jeff Hubbell and Lindsay Olson are engaged in a grand experiment on the far edge of West Laramie, where gravel streets meet cow pastures.

They are turning a former 1-acre residential lot into a small farm. From making their own compost to amending their soil, to using a new season-extending hoop house for vegetables, Jeff and Lindsay have their eyes on the prize of sustaining the business by growing high-dollar mushrooms year-round.

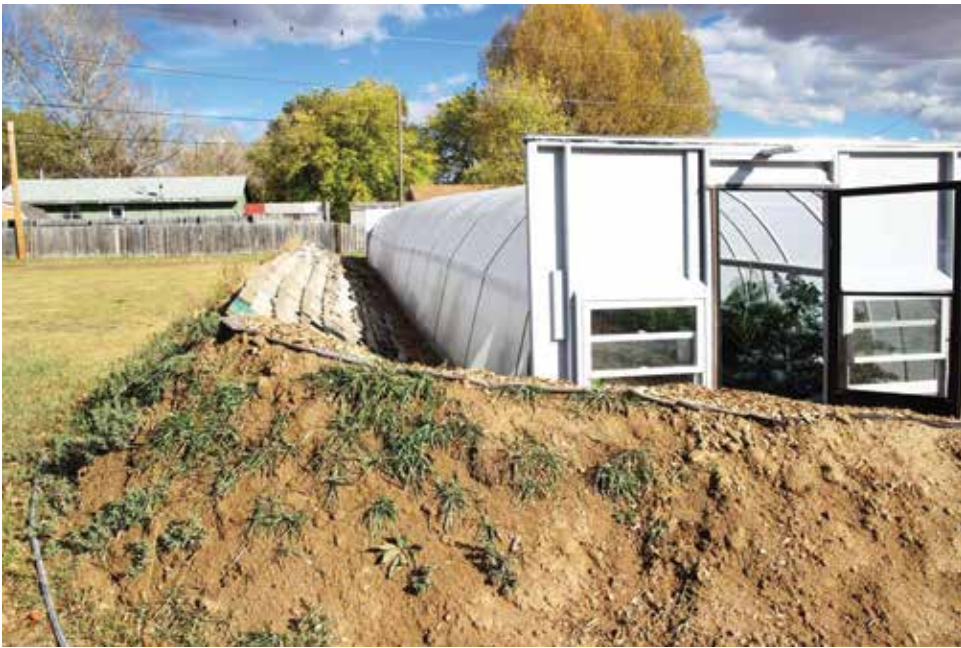
Compost and Substrate Operation

Soil is at the heart of any growing operation. Unfortunately, soil in parts of southeast Wyoming is not one of its best natural resources. These two backyard farmers aim to “keep it local.” Jeff and Lindsay collect unused vegetable matter from a downtown

restaurant and the food co-op, sawdust from carpentry shops, wood chips from a forest management company, and grass clippings from a landscaper to make their own compost for soil amending.

Native soil is mixed with these and aged for at least a year. Vegetables are grown on the surface of the piles while the mix is aging. To further improve their soil mix, biochar is made by burning wood scraps. The mix, when finished, goes into their hoop house and an ever-growing set of outdoor vegetable beds.

They reuse free wood waste collected around town as substrate for mushrooms. Lindsay and Jeff exclusively grow wood-consuming or “saprophytic” mushrooms and make custom sawdust blocks for substrate from sterilized wood chip mixtures. Lindsay and Jeff use cottonwood chips because the wood quickly



Hoop house bermed on north and northwest for wind protection

decomposes – and there is a ready supply because many cottonwoods in Laramie have been taken down. The substrate is prepared by pressure cooking sawdust or straw in autoclavable bags on the stovetop for 1.5 hours at 15 pounds per square inch

The Hoop House

Any farm in a place with a 90-day growing season needs a means to extend the season. Jeff and Lindsay already had a small greenhouse for starting vegetables but needed something more substantial to go into production.

They obtained a Wyoming Department of Agriculture specialty crop grant in 2015 to help build a 92-foot long by 12-foot wide by 10-foot high hoop house. Rather than using bent PVC tubing for hoops as often seen in this magazine, Lindsay’s father, Ray, used galvanized steel top-rail tubes designed for chain-link fence. Steel tubes can be pounded into the ground and kept straight until the bend is needed for the rounded canopy; bending was achieved with Ray’s pipe bending tools.

The result is straight hoop house sidewalls to 4 feet high, allowing for more working and growing space within. The hoop house is situated east-west and slightly dug into the ground to further protect the structure from the cold north wind. An earth

More mushroom material

Jeff and Lindsay recommend more information on growing mushrooms in general is at www.fungi.com and just about anything written by internationally acclaimed fungi expert Paul Stamets. You can also pick up a package of Jeff and Lindsay’s mushrooms at the Big Hollow Food Coop in Laramie and/or follow news of their operation on Facebook under “Planet Laramie Farms and Mushrooms.”

berm runs along the north long side and around the northwest corner, with concrete blocks on the interior wall of the berm to help collect heat and hold the berm together (see photo left).

Wood chips inside the berm provide another microenvironment to grow mushrooms in the summer.

There are 4-foot wide beds inside the hoop house with three driplines running down each bed. Crops are rotated annually or within a growing season to maintain soil nutrient balance and minimize disease. The driplines are set up in zones so plants requiring varying amounts of water can be planted in given zones and receive the correct amount of water.

Jeff and Lindsay are experimenting with a pea/vetch mix as a cover crop to hold moisture and provide essential nitrogen. Sunflowers are planted around the interior to add color and, more importantly, to draw pollinators. The variety of garden plants and watering regimes in the hoop house provide a variety of microenvironments in which to experiment with growing mushrooms. Crops produced for sale at the farmers market and co-op include an array of heirloom tomatoes, chard, kale, onions, peppers, eggplant, and cucumbers.

The “Fungilow” and other Microenvironments

Growing mushrooms is still not an exact science despite all the advances in horticulture in the past century. Jeff and Lindsay are always looking for and trying new microenvironments to inoculate with mushroom spores or place inoculated blocks the size of salt blocks. These need to be continuously moist locations like under the leaves of squash plants or in holes in cottonwood logs (see photo page 7). The north side of the hoop house looks especially promising because it provides shade and sheds water into the growing area.

Substrate drying out is one of the biggest problems in this climate. All of the experimentation out-of-doors is wonderful as the farm is being developed, but the real heart of the mushroom operation is the fungilow, an indoor, temperature- and humidity-controlled room with a floor drain that can be sterilized every two to six months.

How is inoculant made? Lindsay and Jeff buy sterile spores on an agar (sterile sugar substrate) so they are certain of the purity. After incubating in the sterile fungilow for a few weeks, the agar can be split onto grains of barley for a few weeks, then onto sawdust for a few weeks – each step produces more inoculant to work with. According to Lindsay, “You can basically step in at any level of the process.”

Ideally, the final product is grown out on sawdust blocks in the fungilow for the first of two or three fruitings (sprouting of what we know as mushrooms). The first fruiting is usually the best in quality and quantity.



Jeff Hubbell



Plugs inoculated with Shiitake mushrooms are inserted into a cottonwood log, above, or blocks of wood made from sterilized woodchip mixtures such as these oyster mushrooms, below.

Due to space limitations, inoculated blocks are typically moved into a greenhouse, the hoop house, or other locations after the first fruiting or “flush.”

The key for the varieties they grow right now is to have nighttime temperatures below 60 degrees Fahrenheit with daytime temperatures in the mid-60s. Mushroom varieties can be chosen to match a climate. They want to ultimately focus on cold weather varieties like shiitakis in the winter and warm weather varieties like pink oysters in the summer.

A few words on distributing inoculated blocks around the property: for practical purposes, Lindsay likes placing inoculated sawdust blocks in different locations in the hoop house and around the property (like on the north side of the hoop house) since most people don't have a sterile room.

She is always looking for ways to incorporate mushrooms into the garden and landscaping so she can share that information with fellow gardeners. For making a viable business, the real production happens in



the fungilow because of the sterile, controlled environment.

What's Next?

With only one season using the hoop house, outside beds still being developed and with only a few years growing mushrooms, the operation is still growing at a rapid pace. They will be planting fruit trees soon and fine-tuning where to establish windbreaks.

But with everything else going on around the farm, Jeff still wants to focus on mushrooms.

“Why focus on mushrooms? They are the most unique and profitable product we can grow here. Unfortunately, they are the most complicated and hardest to grow,” he says.

It's a good bet **Tony Hoch** may have tried some of Jeff and Lindsay's products. Hoch is director of the Laramie Rivers Conservation District in Laramie and can be reached at (307) 721-0072 or tony.hoch@lrkd.net.