

## Morel mushroom farming - indoors under controlled environment



[midnight-harvest.com](http://midnight-harvest.com) Interlochen MI

SB28 Food & Beverage Agriculture & Agtech

### LEAD INVESTOR



#### Michelle Irwin

Midnight Harvest has made major breakthroughs in morel cultivation and study over the past several years. They have had many successes in multiple types of mushroom productions and supplied many local restaurants and markets with fresh, sustainable products. Midnight Harvest is a passionate and driven citizen-accout company on the brink of next level of indoor commercial production that could impact the world of fungi- and the kitchen as we know it! So promising things to come as Midnight Harvest continues their journey to full scale, marketable production.

Invested \$1,000 this round & \$1,000 previously

## Highlights

- 1 Morel mushrooms are a foraged item worth tens of billions worldwide.
- 2 Repeatable scientific proof and process.
- 3 Few competitors in the global market allowing for great growth and marketshare.
- 4 1st Ever to grow morels year round in a single stage system for commercial use.

## Our Founder



#### Matthew Hall Owner/Grower

Born and raised in Northern Michigan - absolutely love growing plants and food. Tinkerer since day one and love to find out how things work and function.

Morels are worth billions of dollars as a foraged item - if they were to be cultivated and commercially grown they'd be worth far more. I chose this idea because of the potential and impact it could have if we figured it out. Knowing the worth of morels I knew that I could change lives and not just mine.

## The Farm Dream

In 2012 I changed careers pretty dramatically, going from a potential career in dolphin training to wanting to be a farmer.

Looking back it's been quite the journey to where I am today.

Moving back home in 2012, I knew I wanted to start a farm. Trying to figure out where I would fit in within the food scene, I started working in various areas: volunteering at a local farm, attending MSU Master Gardener school, and building raised garden beds for local friends and family.





Growing food was where my farm dream started. This is a bush bean in a soil block.

**A TEDtalk by Paul Stamets lead me to mushrooms.**

Living in Northern Michigan's variable climate, we've adapted to growing mushrooms indoors entirely. They can be grown in a vertical setting, which is great because you can have greater impact with less space.

### **Mushroom Farming**

My passion for fungi led me to attempt my own grows. I humbly began with a small greenhouse in our basement, homemade flow hood, and yes, plenty of mistakes.



Mycelium, the living body of mushrooms.

After studying fungi for 4 years, upgrading equipment, and undergoing some room renovations, I was ready to sell. I started small at first, only serving 1-2 clients with 5-10lbs of product per week. When I realized there was a market for my mushrooms, I had got a small line of credit from my bank, which had allowed me to make some bigger moves and get into even better equipment.





## We are now in production!

I have now expanded my operation to growing about 50-60lbs of fresh shiitakes per week. I am selling to local retail outlets and local restaurants every week and generally sell out of all that I grow.

My first accounts were people I knew from my years within the hospitality space, familiar faces that I met and worked with along the way. Now, after years into production, I have interest from people I've never met!

## Press

My work has been featured in a variety of mediums, including print publications, TV spots, and podcasts. This has been tremendous for our growth and local notability.

Publications | [Edible Grand Traverse](#), [Grow-Bio](#), and [Northern Express](#).

TV Spots | [9&10 News](#), [7&4 News](#).

Podcasts | [Talk Farm to Me](#), [The Modern Health Nerd](#)



## The Morel Mushroom 🍄

Even though I was seeing success while growing shiitakes, the whole time I'd been researching morel mushrooms. But why?

Morel mushrooms are one of the most sought out fungi in the entire world.

Ranking with big players like truffle, chanterelle, and bolete - I realized morel mushrooms are a huge industry.

They are worth tens of billions globally. However, they're only available for a short period of the year - and only mother nature provides.

Morel mushrooms have never been grown commercially indoors like shiitake! Many have tried and a few have seen glimmers of success, but nothing substantial or sustainable year round.

2 companies are using methods from the 1980's. [Mycopia](#) and the [Danish Morel Project](#) are actually the same systems - but executed slightly differently. China has produced morels outdoors in huge production fields but this system is still subject to season. [Penn State](#) did a trip to the Chinese farmers to understand their methods.

Researching morels was like filling out a lottery ticket but more calculated. In the event you hit all the numbers - jackpot.

In the spring of 2020 we finally did it - I grew morels on petri dishes.





As far as we know, never before has a morel been grown indoors in the lab on a nutrient rich source. Our genetics were from Penn State Culture Labs.

As far as we know, this was the first time morels have been grown on a nutrient rich media in a controlled setting.

Since that moment in March of 2020, I have grown morels hundreds of times on both plates and on bigger media.



Finally almost 2 years after our initial discovery we have the 3rd part of our equation. We now know why and how morels grow in size. Soon we'll be able to switch our entire farm from shiitake to morel.

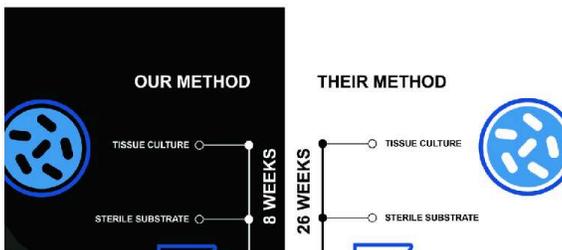


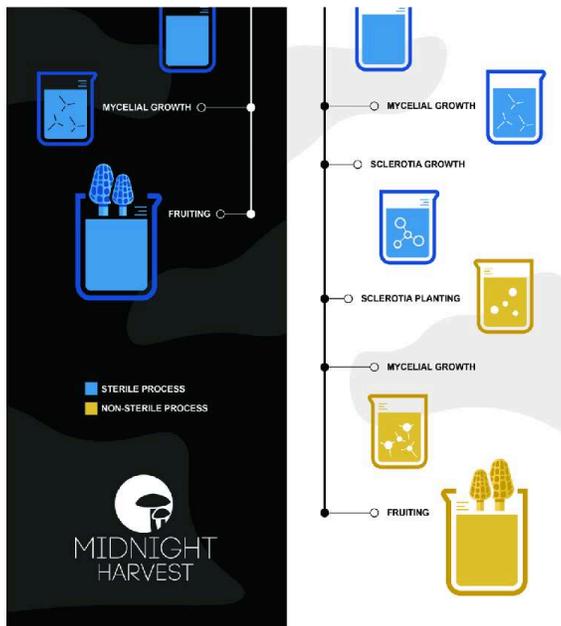
### How are we different?

1 - I use a nutrient rich media. It was long thought that morels require nutrient depletion for growth. This is false. Hence why we can grow them on petri dishes which are rich in the nutrients that fungi love.

2 - Our process mirrors all other gourmet mushroom farms. Media is inoculated with a spawn of morel, incubates, and then put under fruiting conditions. Our last 3 trials did just that - and produced morels.

3 - The process could likely be automated. There are in fact automated mushroom farms doing millions of pounds of mushrooms a year - and our discovery could make them now have morel. It's a scalable equation.





Our Process vs Other processes

### Mushrooms & Margins

Our total COGS for shiitake are averaged \$2.18(+/-) but are always under \$2.50.

We sell 1 pound for \$10 to local restaurants/retail outlets. Directly we could capture \$15/lb.

Even selling completely to restaurants/retail I make \$7.50 per pound. If I had a direct route, we'd make \$12.50/lb.

### Yields

We typically see a 1+lb yield per shiitake block - so we can actually increase margins just by having an amazing growing recipe (which I do). We average 1.25lb/block and our best harvest was 2lbs 4oz(!!!), on our normal harvest of 1lb 4oz(1.25). That additional 4oz is worth the cost of the blocks which means we generally average \$10lb due to increased yields.



We typically see a great amount of morels per test

COGS - 2 of the biggest costs is the bag the shiitake goes into which is a one time use. The second biggest cost is the spawn that we purchase.

We'll be investing in reusable containers which are already in the market so we're not reinventing the wheel (just yet).

We'll also be producing our own spawn thanks to our trade secret process.

With these factors and methods of production, Morel could actually be cheaper to produce while being one of the most profitable yields.

In the first year of research we will be exploring yields and growth timelines. This will be crucial in knowing how much square feet we'll need to

achieve our long term goals.

**Price per pound.** This is where the morels meet margins. Morels have a swing pricing due to supply and demand. Starting in January morel prices go upwards of \$75/lb direct to consumer; about mid-season March-May their price will dip as supply increases. As of April 12th 2022, prices are around \$42/lb direct. In June when the season is near over prices sky rocket again into the high 70's, eventually leading into July when all you can find is dried morels - nothing fresh.

This will be to our advantage as we aim to be the only supplier of year round fresh morels. Prices could actually increase beyond \$75/lb.

**Industry leading suppliers** | [Mikuni Wild Harvest](#) | [Foraged Market](#) | [Morel Masters](#)

**Marketshare** | Between August-January we'd effectively own the fresh morel market. Prices could actually increase at this time due to demand for our product.

**Cleanliness** | The bigger aspect to also consider is morels coming from foragers are not clean. They have to be thoroughly washed so there is no sand and insects.

**Consistency** | High end retail and luxury restaurants will love this product for it's flavor and consistency, and cleanliness. Now they can plan a menu around morel knowing we will be providing a year round consistent product.

## The Plan

Our goal in 2022 will be to convert our entire operation to morel production and launch a direct to consumer platform. Initially it'll be small, only 50lbs a week - but soon we'd be able to grow upwards of 140lbs per week within the same year.

50 pounds/week selling at \$75/lb - \$3750.00/week and \$195k+/annually.

*\*\*\*The business even at a very small scale is instantly liquid and able to provide it's own capital for growth.\*\*\**



I'm already setup to be a morel farm.

140 pounds/week selling at \$50/lb(wholesale) - \$7000/week and \$365K+ annually.

Direct to consumer will build the value and provide great margins.

Within 5 years our goal is to be producing over 1000lbs of fresh morels per week.

1000 pounds/week selling at \$50/lb(wholesale) - \$50,000/week and \$2.6million+annually.

We'll run a balance of D2C and B2B to increase overall revenue.

A mixed venue model brings in nearly \$3million in annual revenue with a majority going towards wholesale accounts.

During that time we'll explore value-added products, morel 'experiences' such outdoor spawn applications, and be the leader in anything morel related. All of which are low cost high margin experiences.

*Forward looking financial projections cannot be guaranteed.*

### **Want to know more?**

I've published a lot of my own work in a blog spanning year of research.

Morel - Clear line of sight - The moment we grew gold.

Morel vs Morel - Highlights the differences in my operations vs other known morels.

Morel - Soon a year round commodity. Successful testing.

Morel on the horizon - imagery captured from some of our samples.

Morels - Imagery I've captured growing them indoors.