

HOW TO GROW MUSHROOMS: THE ULTIMATE GUIDE

Growing Mushrooms....The Easy Way





How to Grow Mushrooms: The Ultimate Guide

If you want to grow mushrooms as a hobby, side-line income or even a full time business, then what's the best way to go about it?

Well, if you start scouting around the internet you'll find all sorts of over-complicated ways to do it..

...pressure cookers, sterile laboratories, conflicting advice on the right methods....

I know, because that's how I taught myself how to grow many years back.

However, I'm a big fan of keeping things simple, and together with my colleague Eric, we've made it the mission of GroCycle to demistify mushroom growing.

We call our approach: Low Tech Mushroom Farming.

This book has some great information on growing mushrooms. All in one place

Let's dive straight in!

How To Grow Mushrooms: The Ultimate Guide

 grocycle.com/how-to-grow-mushrooms/

Learning how to grow mushrooms is more straightforward than you might think.

Much of the same information applies whether you want to grow a small amount of mushrooms at home as a hobby, or start growing mushrooms on a commercial scale as a business.

Many of us grow up watching our parents in the garden picking tomatoes and carrots, but it's still quite rare to see people growing their own mushrooms at home.

The idea of growing your own mushrooms can seem mysterious and complicated if you don't have any previous experience with it.

Don't be intimidated by the idea though. Once you know the basics, growing your own edible mushrooms is just like growing any other fruit or vegetable.

In this article you'll learn all about the life cycle of mushrooms, what types of mushrooms to grow, and how to grow them.

If at any point during this article you find yourself confused about the terminology being used, please refer to the glossary at the end.

Growing Mushrooms At Home Or On Small Farms



Mushrooms can be a great way to diversify the types of crops that you grow at home or on your small scale farm.

In fact, people have been growing mushrooms in small indoor spaces for hundreds of years.

Mushrooms are very versatile and can be grown in all kinds of different environments and small areas.

You can grow them indoors in a spare room or used basement, or even plant them alongside your vegetable garden outside.

If growing mushrooms is something that you've always wanted to do, there's no better time to start than right now!

Even if you live in an apartment, you've got enough space to start growing your own delicious and nutritious mushrooms.

Unlike conventional crops, there isn't even any messy soil to deal with. So they're perfect for growing indoors.

The Mushroom Life Cycle



Before I start talking about how to grow mushrooms, it's important to first understand the grow cycle of a mushroom.

You'll need this knowledge to have the insight necessary to cultivate your own mushrooms.

When most people think of mushrooms, they are only aware of the stem and cap that appear. Not many realize everything that goes into creating the mushrooms.

This includes a complex network of mycelium that is often much larger than the mushrooms you see on the surface.

Mycelium is a network of cells that appear similar to a plant root system. Except mycelium is actually more like the plant and mushrooms are just its fruit

Mycelium has just one goal, to keep its species going. It does this by growing mushrooms to produce spores and reproduce.

In The Wild



In nature, the life cycle of a mushroom both ends in one way and begins in another at the same time.

This all starts when a mature mushroom drops its spores. Spores are basically the fungi equivalent of seeds for a plant.

Spores fall to the ground and mix with other compatible spores. This starts the growth of mycelium.

Mycelium can either be a single organism or several different organisms working together as a colony.

The largest organism in the world is believed to be a mycelium mat that covered a 2,400 acre (970 hectare) area in eastern Oregon state.

After the mycelium has had a chance to grow, it will start producing pinheads. These are small bumps that will eventually become mushrooms.

But first they go through another stage called primordia, which look more like miniature baby mushrooms.

Eventually the primordia grow into full-sized mushrooms which then mature, drop their own spores, and the whole cycle begins again.

Cultivated Mushrooms



When growing mushrooms commercially, you largely mimic the same life cycle that mushrooms go through in the wild. But with some key changes to maximize yield and other factors.

Growing mushrooms starts by obtaining spores or spawn. We already know what spores are, but what is spawn?

It's any substance that already has mycelium growing on it which you can use to speed up your mushroom growing process.

Using spawn or spores, you'll want to prepare a mushroom substrate. A substrate is any substance that mycelium can grow on.

Mushrooms are often referred to as the "fruit bodies" of the mycelium.

Different species of mushrooms grow on different substrates. Some aggressive species like oyster mushrooms will grow on coffee grounds, while others require wood to digest for energy.

The next step is inoculation.

This is when you introduce your mushroom spores or spawn to your substrate (also known as a growing medium).

Although not necessary, this is generally done under sterile conditions to minimize the chances of mold or other fungi species from competing with the mushrooms you're trying to grow.

Once your substrate is inoculated, the next step is to incubate it. This typically involves putting your substrate in a warm dark place for anywhere from a few weeks to a few months.

During this time, your mycelium completely colonizes your substrate and you'll often end up with a solid white mat of mycelium on the outside of your substrate at the end of the process.

You then place your substrate into fruiting conditions after the incubation period is complete.

This usually involves cutting open the bag that your substrate was stored in to expose them to fresh air. The substrate is misted with water throughout the day during this stage to keep it moist.

After a few days you'll start to see pinheads (primordia) forming on your substrate. These will eventually grow into full-sized mushrooms.

The timing of your harvest your mushrooms will depend on the species that you're growing.

Some species of mushroom can be harvested and will grow back several time. Each wave of new mushrooms is referred to as a flush.

Once your substrate is exhausted of all its energy it stops producing mushrooms.

As you continue to re-use your initial mycelium to inoculate more and more batches of substrates, it will eventually undergo something called senescence. It's a process of deterioration that all living things go through with age, and is basically like old age for mushrooms.

The mycelium loses its strength and ability to grow and divide. Once your mycelium starts to get weak, you'll need to get new spawn to start with or grow from new spores.

Most Popular Types Of Mushrooms To Grow



There are plenty of different options when it comes to growing edible mushrooms for yourself.

One of the huge benefits of growing your own mushrooms instead of harvesting them from the wild is that you can be certain you're not preparing a poisonous mushroom. As long as you get your spawn from trustworthy sources!

Some of the most popular mushrooms to grow include:

1) Oyster Mushrooms

These are probably the most widely grown mushrooms by beginners. Oyster mushrooms are consumed less than button mushrooms in the West, but they're very popular in Asian countries for everyday cooking.

They have an appearance that you may not have seen before in a mushroom. That's because in nature they grow on the side of trees, so they have a large flat cap with little or no stem.

-> Check out our Ultimate Guide To Growing Oyster Mushrooms

2) Button / Crimini / Portobello Mushrooms

If you've only ever eaten one type of mushroom in your life, I can almost guarantee that it's this one.

These mushrooms are actually all the same species. The only difference is how long they're allowed to grow before being harvested.

When these mushrooms first appear from the mycelium, they start off as button mushrooms.

As they get a bit larger, they develop a brown color and become what is usually categorized as crimini in shops.

Finally they fully grow into a portobello mushroom. These are the big brown mushrooms with dark gills underneath that are often sliced up or grilled whole. They have a tougher, more meaty texture.

3) Shiitake Mushrooms

Shiitake mushrooms have a smoky, earthy flavor and a texture similar to portobellos.

In addition to being delicious, they also offer several health benefits including compounds that can help to lower cholesterol.

In stores, shiitake are normally sold dried. But eating them fresh is a real treat.

Shiitakes are often grown outdoors on logs.

-> Check out our Ultimate Guide To Growing Shiitake Mushrooms

4) Enoki

Enoki mushrooms are very small with long stems. They grow together in tight clumps. If it weren't for their tiny caps, they would look almost like spaghetti!

Enoki are very compact so you can grow them without much space required. They're typically grown in jars.

5) Maitake

Maitake mushrooms are another variety that is both delicious and also has strong nutritional and health benefits.

Don't be confused by this mushroom's nickname "hen of the woods." The name comes from its appearance which people say resembles the ruffled feathers of a hen, and doesn't refer to its taste.

Maitake has a very strong, earthy taste and I'd recommend trying some to make sure you like it before you spend time growing it!

How To Grow Mushrooms



Each different type of mushroom has its own specific growing needs.

Shiitakes can be grown on hardwood sawdust or wood. White button mushrooms and portobellos need to be grown on composted manure.

Oyster mushrooms will grow on a variety of different substrates including straw and even cardboard or coffee grounds!

Growing Mushrooms Indoors



There are several ways that you can grow mushrooms indoors. It's a very convenient way to grow your food and also super quick.

Mushroom Kits



If it's your first time growing mushrooms, you may want to purchase a mushroom growing kit.

Mushroom kits come with your substrate already inoculated and incubated, so they're ready to start growing as soon as you get them.

All you have to do is open the box and cut a hole in the bag, and mist or spray some water on your kit each day. About a week later, you'll start to see little mushrooms start to emerge. And after two weeks they should be fully grown and ready to harvest and enjoy.

Starting with a kit is a great way to build your mushroom knowledge and get an understanding of the life cycle that a fungi goes through.

It allows you to skip the more difficult parts of the mushroom growing process so that you can avoid issues with mold or contamination.

Kits provide a foolproof way to have your first success with growing mushrooms.

You can check out [oyster mushroom kits](#) that we have for sale in the UK.

If you're outside of the UK [these kits are great](#) too:



Grow Your Own Mushroom Kit

Pick up a grow your own mushroom kit to grow your own Oyster mushrooms in your kitchen at home

[Click for prices](#)

Growing Oyster Mushrooms At Home



If you want to grow oyster mushrooms at home without using a kit, I'd recommend checking out our [ultimate step-by-step guide](#) to growing oyster mushrooms.

It walks you through every step of the process and gives you everything you need to know. Including:

- Picking out the strain of oyster mushroom you want to grow
- Choosing a substrate to grow on (straw or coffee grounds are commonly used)
- Ordering all of the supplies you'll need
- Preparing, inoculating, and incubating your substrate
- How to fruit and harvest your oyster mushrooms

Growing Button Mushrooms



Button mushrooms are another variety that are easy to grow. There's the added benefit that they are the type of mushrooms you're already used to buying and cooking.

Button mushrooms are typically grown in trays that resemble seed flats.

They can come in any number of dimensions such as 10"x20" or 14"x16", but the important thing is to use trays that are about 6 inches deep.

You start the process by filling the trays with composted manure and inoculate it with button mushroom spawn.

Then put your tray on a heating pad to keep the soil temperature at around 70 degrees F (21 degrees C) for about 3 weeks, or until you start to see mycelium appear. It will look like small threadlike roots spreading through the soil.

Once you see mycelium you'll want to cover it with an inch or so of potting soil and drop the temperature down to 55 or 60 F (12 to 16 C.)

Make sure the soil stays moist by misting it with water and keeping it covered with a damp cloth. Be sure to keep spraying your cloth as well so it doesn't dry out.

Button mushrooms should be ready after 3 or 4 weeks. Pick them just as the caps start to open by cutting at the base of the stem with a sharp knife.

Avoid just pulling the mushrooms out of the soil, as you might damage other mushrooms around it that are still growing.

Once your mushrooms start coming up, you should be able to harvest every day for about six months!

Growing Mushrooms Outdoors



Growing mushrooms indoors is perfectly safe, and you don't need to worry about button or oyster mushrooms starting to grow around your bathtub or out of the walls just because you're bringing mycelium into your home.

But if you still don't like the idea of growing your mushrooms indoors, there are plenty of ways to do it outdoors as well.

Growing On Logs

Many types of mushrooms that grow on trees in nature will thrive and flourish on hardwood logs.

Shiitake mushrooms are very commonly grown on logs and kept outdoors.

Check out my [guide to growing mushrooms on logs](#) if you're interested in learning more.

It will teach you all the details you need to know including:

- Why grow mushrooms on logs and what varieties do well on logs? What kinds of logs can you inoculate and what is the inoculation process? How long do mushrooms take to grow on logs?
- How and where should you store your logs? How do you shock your shiitake logs into fruiting and harvest from them?

Outdoor Mushroom Beds



You'll have to pick the location for your outdoor mushroom bed based on what type of species you want to grow. But most prefer to grow in shade, so it's best to plan for your mushroom bed to go under a tree where it won't get much direct sunlight.

Most types of mushrooms won't grow well on just garden soil. So you'll want to mix in a fresh growing medium like fresh wood chips, straw, compost, or manure.

You might decide what type of mushrooms to grow based upon what kind of growing medium you can easily and cheaply get in your area.

Your mushroom beds can come in all different kinds of styles. You can simply grow them in a regular garden bed. Or you might want to create a raised bed with timber as you might do for a vegetable raised bed.

To maximize the amount and types of different mushrooms you can grow, you might want to also consider making your raised bed out of inoculated logs. It's not only an efficient use

of space and resources, but it will also give your mushroom bed a neat rustic look.

You can use this method to grow shiitake or reishi mushrooms out of the logs surrounding your bed while growing a different type of mushroom within the bed itself. It's like intercropping vegetables, but for mushrooms.

Follow the instructions for your specific spawn to determine how deep you need to mix it in, and how large of an area one bag of spawn is able to cover.

Mushroom beds don't normally need to be as deep as vegetable beds and only need about 6 inches of substrate.

I'd recommend keeping each bed less than 4 feet wide to make it easier to harvest. That way you won't have to walk over your bed or lean far over it.

Make sure to follow instructions carefully in terms of what temperature your spawn needs to grow and spread. If you put your spawn into your bed too early or too late into the year, it could be too warm or cold for mushrooms to grow and end up being a waste of your investment.

In terms of what kinds of mushrooms to grow in your raised bed, I'd recommend wine caps as my top pick for beginners. I like their distinctive red cap, which is hard to mix up with other native species that may also decide to grow in your mushroom bed.

Spring is the ideal time to start growing them under a fruit tree, between rows of vegetables, or anywhere that they'll be shaded from direct sunlight.

You'll need to lay down cardboard, hardwood chips, or moistened straw in your bed to grow these.

Other good choices for your mushroom bed include blewits and shaggy ink caps.

I would strongly recommend avoiding growing button mushrooms outdoors. In both North America and Europe there are some deadly poisonous mushrooms which can resemble button mushrooms early in their growth cycle.

Growing more distinctive looking mushrooms will help avoid the risk of mixing them up with other types of mushrooms that may happen to fruit in your garden.

Growing Mushrooms Alongside Vegetables



You can always interplant mushrooms within the same garden that you grow vegetables as well.

You'll want to use a no-till gardening method. Otherwise you'll disturb the mycelium in the soil.

If you mulch or compost your crops at the end of your season, then you don't need to really do anything extra to prepare your garden for mushrooms. Plants and mushrooms have a very ancient relationship of working together.

In fact, most plants rely on mycorrhizal fungi growing in their root system to be able to grow.

Adding fungi to your soil really creates a living ecosystem. The fungi will break down organic matter in your soil. Worms in your soil will love it, the fungi will love it, and your fruits and vegetables will love it as well. Everybody wins!

How Much Time Does Growing Mushrooms Take?

Growing mushrooms doesn't have to be a full-time commitment.

If you're growing using a kit, then growing your own edible mushrooms at home takes practically no time at all. Only a couple of minutes per day to mist your growing medium to keep it moist.

Of course you can make growing mushrooms into a full-time goal as well. Or you can even grow mushrooms as a side business if you've got an extra 10 hours to devote to it each week.

Growing mushrooms can be an excellent way to make a little extra income. And the best part is that it scales well depending on how much time and effort you want to put into it. So you can grow as much or as little as will fit your schedule.

How Much Can You Earn Growing Mushrooms?



This depends on so many factors that are different for most people depending on for instance location. In Greenland you can fetch \$50/ kg but in the US Shiitake and oyster mushrooms both sell for \$10 or more at retail prices and \$6 per pound wholesale.

In a growing space that's just 100 square feet, you can have a harvest every eight weeks or so, for a total of about 2,400 pounds of mushrooms per year.

That's about \$14,000 per year at wholesale prices, or even more if you're willing to put in the extra time to sell at farmer's markets or directly to restaurants and chefs.

You can also approach smaller local grocery stores to see if they'd be willing to stock your product. Before long, you could be earning as much as \$25 per square foot of growing space that you devote to mushrooms year-round.

Do I Need A Clean Room To Grow Mushrooms?



Our mixing & inoculation room. Nice and simple - just a compost tumbler and workbench
(we don't even use the Hepa air filters these days)
Not at all! I teach low tech ways to start growing your own mushrooms.

Early in my career I invested in a lot of expensive, energy-intensive equipment that is typically used in commercial mushroom growing. But I quickly realized that for some types of mushrooms, this simply isn't necessary.

It depends on which variety you're trying to grow. With some more sensitive types of mushroom I've had mixed results.

But when it comes to shiitake and oyster mushrooms, I'm having good success and reliably grows with a low-tech approach.

Many growing mediums are already pasteurized when you get them and don't need to go through any additional treatment. Sawdust pellets are already pasteurized from the heat and production when they're made.

Coffee grounds are pasteurized from the brewing process as long as you use them within about a day of brewing. Even straw can be easily pasteurized by soaking it in a cold water high pH bath.

Glossary



Here are some important mushroom-related terms that you should know to grow mushrooms.

Spore: A mushroom spore serves a similar purpose to the seed of a flowering plant. It's how fungi reproduce.

Hyphae: The thin fungal filaments that grow from mushroom spores. When hyphae of the same species of mushroom meet, they'll begin to join together to create mycelium.

Mycelium: The vegetative part of a fungi that lives beneath the surface of a growing medium. It's where the chemical and nutrient exchanges happen and often resembles the root system of a plant. If you're out in nature, look under some fallen logs or sticks and you'll likely see a network of mycelium.

Substrate: Also referred to as the growing medium. It's what fungi grow on and derive their nutrients needed to fruit and produce mushrooms. Common substrates or growing mediums include hardwood logs, straw, wood chips, cardboard, and coffee grounds. Some use spent brewery grains. A lot of growers falsely think that substrate always needs to be sterilized before being inoculated to prevent contamination with mold or other types of fungi.

Inoculation: This is when you introduce mushroom spores or spawn to a growing medium such as sawdust or a log. If the conditions are right, spores will germinate and begin to grow.

Spawn: A growing medium that has been pre-inoculated and has already established a healthy amount of mycelium. It can be mixed into a larger amount of substrate to grow a larger amount of mushrooms.

Incubation: After a growing medium is inoculated with mushroom spawn or spores, it's stored somewhere in ideal conditions to incubate. During this time, mycelium starts to break down the organic matter of the growing medium and absorb its nutrients, spreading throughout the substrate. This is called colonization or mycelial expansion.

Hyphal knots / Primordia: After mycelium has fully colonized a growing medium, it will start to form hyphal knots, or raised bumps on its surface. These will then develop into primordia, or baby mushrooms.

Fruit body: The actual mushrooms. If mycelium is the vegetative part of a fungi, then mushrooms are like its fruit. All of the energy and nutrients are channeled into the fruit body so that it can produce spores and continue on the mushroom life cycle.

Flush: A crop cycle or harvest of mushrooms. Most mushroom varieties will produce several flushes before the growing medium needs to be broken up and used as spawn to inoculate fresh substrate.

Ascomycete: Mushrooms that create their spores inside long, sac-like structures called asci. Examples include truffles, morels, cordyceps, penicillium, and even the yeast used in bread making.

Basidiomycetes: Mushrooms that make their spores on the tips of "basidium" or club shaped structures. Examples include puffballs, chanterelles, boletes, portobellos, and oyster mushrooms.

Predeterminate mushrooms: Mushrooms that are pre-formed and have all their required parts such as cap, gills, and stems in the early stages of life. If damaged early, defects will show up in mature mushrooms.

Indeterminate mushrooms: A mushroom that doesn't have a determined shape until mature. If an indeterminate mushroom runs into obstacles like a twig while growing, it will simply grow around it.

Yield: The amount of mushrooms harvested from your growing operation. Yield can be measured in terms of how many pounds of mushrooms you harvest per square foot of growing space, or the total number of pounds of mushrooms that you produce in a flush or year.

