# How to Grow Elm Mushrooms

*www.mushroombox.co.uk – Suppliers of Mushroom Spawn, mushroom dowels and mushroom kits*

**Storage Instructions:** The spawn supplied by MushroomBox must be stored in a clean place at 0-5ºC until use (eg refrigerator). Spawn will lose its viability with age, so it is best used sooner rather than later. The spawn needs to breathe, so do not store in a sealed container. Do not allow the mushroom spawn to freeze.

**Substrate Preparation**

Select your substrate. Elm mushrooms require cellulose-rich material, and will grow on a variety of substrates including: clean toilet tissue, sawdust, woodchips, logs, waste paper, waste card or cardboard, papermill pulp waste, old cotton clothes etc. If using wood/sawdust/chips, then hardwood is best.

For these instructions, I will describe three methods:
*a) toilet roll substrate*
*b) sawdust in tetrapack*
*c) sawdust in polythene bags*

Pasteurise your substrate – this isn't a sterilisation technique, it simply reduces the numbers of competing microbes. Research has found that in the absence of aseptic technique, pasteurisation is preferable to sterilisation, as it allows 'good bacteria' to grow alongside the mushroom mycelium.

If you are using a toilet roll (or kitchen roll), place the toilet roll on a paper plate. Next boil a kettle, and slowly pour the boiling water into the centre of the toilet roll. The water will soak through the toilet roll. When the toilet roll is completely saturated, stop pouring.
If you are using sawdust, place the sawdust into a clean container (I've used a 5litre measuring jug),

and pour boiling water onto the substrate, until it is completely soaked. The moisture will be drawn up through the medium by capillary action – so you don't need to drown the sawdust. For larger quantities, pasteurisation may be achieved by using an oil drum with the top cut off, and a burner

placed beneath the oil drum.  If you are preparing bulk quantities, aim for a temperature of 70C and maintain for 1-2hours to ensure that all of the substrate is pasteurised.

Leave the substrate to cool. The time taken to coll will depend on the mass of substrate prepared. If you are using a toilet roll, this should take 15-20minutes to cool. If you prepare 5litres of sawdust, it will take over 30minutes. Do not proceed to inoculation until the substrate is cooled to 35ºC or lower. Exposing the spawn to 40ºC or higher will kill it.

**Inoculation**

At this stage it is important to keep everything as clean as possible to minimise contamination. It's not necessary to operate in a sterile environment, as the mushroom spawn will greatly outnumber competing organisms, but by maintaining a high level of cleanliness, a greater chance of success will be guaranteed. Wash hands thoroughly before commencing. Avoid touching your clothes, skin, worksurfaces etc, and wash any implements (tweezers, spoon, tray etc) with alcohol (eg propanol or ethanol) immediately prior to use. One excellent way to do this is to use personal sanitisers of the foam type. Ensure that the alcohol is completely evaporated before use, to avoid killing the spawn.

Inoculation is usually done at 2-4% by dry weight (eg 1kg of sawdust may be inoculated with 40g of Epogee oyster mushroom spawn). If the substrate preparation and inoculation is done in laboratory-sterile conditions, you can get away with as little as 1%, but for pasteurised substrates, the higher percentage of spawn is desirable to ensure that competing organisms do not overtake the mushroom spawn.

*If using toilet roll as substrate:*

Use a pair of tweezers to remove the central cardboard roll. Open the packet of spawn and spoon the contents into the centre of the toilet roll. A 50g packet of spawn is sufficient, but you can use up to 100g to speed up the growing period. As soon as the spawn has been placed in the centre of the toilet roll, loosely cover the toilet roll with a large, clean polythene bag. (By fitting the bag loosely, it allows for gas exchange). Next, incubate in a warm place (between 20 and 30ºC) – however, do not exceed 30ºC.





If using sawdust:
You will need to drain the excess fluid from the sawdust, then spread it out onto a tray. Tip the contents of the spawn packet into the middle of the sawdust. Break up any large lumps of spawn to individual grains. Using cleaned and alcohol-sterilised hands (or preferably surgical gloves), mix the spawn throughout the medium until it is thoroughly dispersed.  Then place the sawdust either into a plastic bag or a tetrapack.





If using a tetrapack to contain the substrate, first pierce the tetrapack several times on each face, rotating the knife to produce a hole about a 10mm in diameter, then cover the top with a polythene bag to avoid drying out.




If using a polythene bag to contain the substrate, pierce the bag using a knife to produce small

random splits.

**Incubation**
Place the inoculated substrate in a warm, dark place (eg airing cupboard – but make sure temperature does not exceed 30C) for 10-14days for the spawn-run during which the fungal mycelia will colonise the substrate and absorb its energy. At lower temperatures, the colonisation will take longer.



*After 24-48hours, you should see small cottonwool-like dots appearing throughout the substrate. The toilet roll substrate is the slowest to grow, due to the lack of mixing of substrate and spawn.*



*After 4days, you should see lots of fluffy cottonwool-like growth throughout the substrate and on top of the medium. The bagged sawdust looks almost white due to the extensive colonisation.*

**Fruiting**
After 21-28days growth, the MushroomBox™ Oyster mushroom cultivation must be moved to a light, airy location at a slightly lower temperature in order to stimulate fruiting. If you wish, you can removal of the bag entirely at this stage, and the subsequent decrease in CO2 levels, together with the increase in light should induce fruiting. However, you need to make sure

Next place the substrate into a cool, light, airy location for fruiting. Ideally the temperature should be between 15 and 25ºC for elm mushrooms. They should be exposed to several hours of light per

day. A windowsill is ideal.

If you have used a toilet roll or tetrapack, remove the polythene bag cover. If you have used a polythene bag as the growth container, open the top of the bag. You may, if you prefer, remove the substrate from the bag completely, although this is not necessary.

At this stage, it is very important that the mushrooms are exposed to plenty of air – a build up of CO2 will cause the fruit to be long-stemmed and under-sized. Because the substrate is now exposed to air, it will have a tendency to dry out. This is very detrimental, so if you are using exposed substrate, you will need to spray with water 2-3times per day to maintain moisture content. Within a few days, you should see 'pins' (baby mushrooms) start to develop,which should turn into large mushrooms within a few days.

**Harvesting**
When the mushrooms have grown to a good size they should be cut. Oyster mushrooms carry a large spore load, so ideally, they should be cut before the mature and release their spores.

The mushrooms will fruit in flushes. The number of flushes will depending on the quality of husbandry and the amount of energy available in the substrate. Typically, 3-4 flushes are realised, although it is possible in some cases to achieve a fifth flush.

When the substrate is exhausted it will be a good fertiliser for the garden - place in compost bin, dig into a vegetable patch or greenhouse border, or use as a mulch around the garden.

Supplies
For low cost mushroom spawn in small or large quantities, please visit www.mushroombox.co.uk

Safety Warning
*Take care when pouring hot water to avoid scalds.*
*Avoid inhaling dust created by the substrate or spores from fruiting mushrooms. Dusty substrates will be much safer to handle when damp.*
*Some individuals may have or develop an allergy to oyster mushroom spores. Harvest mushrooms before spores are deposited, and wear a mask when harvesting the mushrooms.*
*Only pick and eat oyster mushrooms. If the substrate is not properly pasteurised, it is just possible that other types of mushrooms may develop, which may not be edible.*

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