

Pearl Oyster Mushroom Log Kit (pleurotus ostreatus)

A long time favourite of wild mushroom hunters, this winter loving oyster mushroom is easy to grow and delicious to eat, on account of it's unusually thick and fleshy cap. Excellent in stir-fries, as a gourmet pizza topping, or in a mushroom and ale pie.

Ideal for beginners, Pearl Oyster is a versatile and productive strain, at home on most types of hardwood log and also recently felled tree stumps. It prefers wider diameter timber over 30 cm (1 ft), especially tree trunks cut into discs, or rounds.

Background

Growing mushrooms using cut logs has been perfected over millennia. The earliest written record of mushrooms cultivated this way, dates back to China, 1313, during the Yuan Dynasty. These early mushroom growers found that by placing freshly cut logs near logs that were already naturally producing shiitake mushrooms, the shiitake mushroom's spores would, after many years, eventually 'spread' to the purposely cut logs. In doing so, a rudimentary system of cultivation was discovered.

Over the last 50 years mushroom growing using logs has been refined and is now much quicker and more reliable. Rather than using spores to begin cultivation, mushroom plug spawn is reproduced from the living tissue of select strains. These strains have been rigorously assessed for both quality and productivity.


Plug Spawn is made using spiral-grooved birch-wood dowels. Under sterile controlled laboratory conditions, mushroom mycelium (*my-see-le-um*) is mixed with the plugs. The mycelium can be clearly seen growing through and around the wood. Mycelium can be thought of as like the mushroom's root system, which is 'planted' or inoculated into suitable timber. The spiral groove is important as it speeds up growth, prevents the mycelium from rubbing off, and it also helps to trap in beneficial oxygen.

The following instructions will guide you through the process of selecting the right timber, the plugging (or inoculation) procedure, and the subsequent production of mushrooms. Please keep these instructions safe for future reference. We hope you enjoy making your mushroom log(s), and that you find mushroom growing a worthwhile experience.

Additional items that may be required to safely inoculate suitable timber:

1) power drill (min 1000 rpm)	4) 8 mm HSS drill bit	7) handsaw
2) lopping tool	5) workbench or sturdy table	8) permanent marker / plant label
3) tape measure	6) chalk or wax crayon	9) rubber mallet or hammer

distributed by...



the CULTURED GARDEN

website: theculturedgarden.co.uk
email: mushroomlogs@gmail.com

Getting Started

Pearl oyster mushrooms can be grown using a variety of green timber: green logs from boughs and limbs, wide trunk sections cut into discs, or rounds; and also recently felled tree stumps which are still rooted in the ground. Preparing a mushroom log or round from green timber is undertaken in 3 stages, over a period of around 4 or 5 weeks. A tree stump, after felling, takes around 20 minutes.

Stage 1: Selection and Cutting

Successful growing requires a source of recently cut, disease free green timber. Logs can be either cut directly from healthy living trees, or from healthy trees which have been felled within the previous 6 months. Tree stumps which are older than 12 months, and logs which are older than 6 months, are not suitable due to problems with weed mushrooms, and drying out. Old dead wood, rotting stumps, and logs which are losing their bark should be avoided.

Suitable Tree Species

Pearl oyster will grow on the vast majority of hardwoods. However, it does prefer the 'wetter' species, such as poplar and willow:

BEST > Alder, Poplar, Willow

GOOD > Ash, Beech, Birch, Chestnut, Hazel, Hornbeam, Maple, Oak, Sycamore

NOT Suitable > Conifer, Fir and Fruit trees

Before cutting logs from standing trees, first check the tree for signs of disease, such as unusual growths, prominent dead branches, and competitor 'weed' mushrooms. If any of these are found, then do not use this timber. Also, ensure tree stumps are the remains of healthy trees, not trees that were felled due to disease.

Timing

Logs can be cut and plugged through March to December. Spring and autumn are generally considered good times of year to cut back trees. Trees felled during their dormant season also have a higher sugar content which is beneficial to mushroom growth.

Selection and Cutting

Pearl oyster prefers wide diameter timber from 20 cm upwards (or 8 inches), choose:

- logs 20 to 30 cm (8" to 12") in diameter—for ease of handling. Select straight sections with a uniform diameter. Try to avoid odd shaped logs, and—as much as possible—avoid knots, wounds, and small branches.
- tree trunk sections 30 to 100 cm (1' to 4') in diameter cut into rounds, 30 cm deep.
- tree stumps cut at ground level to 30 cm above ground level, and between 20 and 100 cm in diameter (1' to 4').

Handle the timber with care throughout; any damage can have a detrimental effect on the eventual mushroom crop. It may help to think of your log as a 'moisture bank' - at all times keep in mind to limit the loss of moisture from the timber.

The number of plugs in your kit dictates; the length of the log; the number of rounds; or the size of the stump that can be plugged:

30 plugs	60 plugs	120 plugs
1 log 50 cm in length (2 ft)	1 log 100 cm in length (3 ft), or 2 logs 50 cm in length (2 ft)	2 logs 100 cm in length (3 ft), or 4 logs 50 cm in length (2 ft)
1 stump or round up to 50 cm wide	1 stump or round up to 100 cm wide, or 2 stumps or rounds up to 50 cm wide	2 stumps or rounds up to 100 cm wide, or 4 stumps or rounds up to 50 cm wide

Using the appropriate tools, carefully remove any twigs and branches, ensuring branches are cut close to the bark. A pressure washer is very good at easily 'cleaning' up timber as it does little damage to the bark.

— PLEASE HANDLE WITH CARE AT ALL TIMES —
Plug Spawn contains MYCELIUM— a living organism

DO NOT OPEN THE BAG UNTIL DIRECTLY BEFORE USE

This mushroom spawn is guaranteed viable until the Use-by-date

Storage Guidelines

If you are planning using the plugs within the next 8 weeks, leave in the packaging and store in a cool, dry place away from direct sunlight.

The spawn can be kept up until the use-by-date by placing the filter bag in a household fridge. Remember to take out of the fridge 24 hours prior to use, allowing the mycelium to acclimatise.

As the plugs age, more white mycelium will be produced. Small 'coral' like growths may also appear. This is perfectly normal, and should be expected.

Quality Assurance

Due to the myriad of factors involved: quality, sugar content, age, species of timber; environmental conditions; etc., it is impossible to accurately predict the quantity and longevity of the mushroom crop.

The plug spawn is guaranteed to be of sufficient quality to produce a mushroom crop given the correct conditions as described in these instructions. After a reasonable length of time has elapsed, if you are not satisfied with the performance of this product, you can request a full refund.

ALL mushroom species listed originate from wild specimens. Some species are foreign strains of species that are native to the British Isles, whilst others are classified as 'exotic' species non-native to the British Isles.

Each strain has been positively screened for: productivity; quality of fruit-body; speed of growth; and ability to adapt to different timber species.

Disclaimer

By purchasing this product and reading and understanding this instruction leaflet, I agree to hereby release the company, the company's employees, and associated suppliers / distributors, from all liability associated with the use of this product. In doing so, I am fully aware of the consequences thereof.

Stage 2: Seasoning the Timber

Freshly cut green timber requires a seasoning period of 4 weeks prior to plugging. This allows for the protective anti-fungal compounds which are naturally present within the wood to dissipate.

If your log is already a month old or more, then further seasoning is unnecessary and the log can be plugged straight away. Also, stumps do not require seasoning, and can be plugged immediately (see Stage 3, below).

To season the timber, it should be stored off the ground and sheltered from strong winds and direct sunlight. For example, indoors in a shed or outhouse. Or outdoors raised on bricks and covered with a tarpaulin.

Stage 3: Drilling and Plugging

Logs

Using an 8mm HSS drill bit (5/16"), drill logs at roughly waist height on a flat stable surface, such as a table, workbench, or sawhorse. Set the drill depth gauge to 1.5 times the depth of the plug. In place of a depth gauge a piece of electrician's tape wrapped around the drill bit will work OK. Take care when drilling; accuracy is more important than speed. Ensure the drill bit 'bites' at right-angles to the log, so that a straight hole is drilled.

Drill holes around the entire circumference of the log only—there is no need to drill holes in the cut ends of the log. Holes should be evenly spaced and each row should be off-set to make a diamond pattern, as pictured left.

Using a tape measure, record the circumference of the log. Divide the result by five. Use this number as the distance between the rows. Mark each row at each cut end accordingly (as pictured right). Divide the number of plugs by five, to give the number of plugs per row.

With the log positioned horizontally, start drilling the first row 6 cm from the left-hand cut end. Space holes 7 cm apart in each row. Then, start the second row 6 cm from the opposite cut end. Repeat for the next 2 rows. It may help to mark out the pattern with chalk or crayon prior to drilling.

Rounds

Drill one face only. Holes are off-set in a diamond pattern, in the outer ring of sapwood, rather than the inner heartwood.

Stumps

Drill holes off-set in a diamond pattern, in the outer ring of sapwood, rather than the inner heartwood. It may help to mark out the pattern with chalk or crayon prior to drilling.

Regularly check the drill bit for signs of rot and disease. If the drill clearance is anything other than white to yellow in colour, and has a musty odour then the timber is showing sign of disease. It should not be used, and the rest of the logs carefully monitored.

Plug the holes immediately after drilling. Your log(s) or round(s) will quickly dry out if left unplugged. Prior to opening the bag(s), squeeze the contents to break up and loosen the plugs. Plug spawn bags should not be left open for extended periods of time as mushroom mycelium is prone to drying.

With clean hands, insert the plug so it stands up by itself, then whack it in, preferably—with a rubber mallet—or a hammer will do, taking care not to damage the bark. Occasionally, a plug may not sit entirely flush with the bark. This is fine, as the mycelium will still be in contact with the timber.

Now the timber has been inoculated with the mushroom mycelium, it needs to be cared for in a way that will help the mycelium quickly grow throughout, or colonise, the timber. This stage is known as the Spawn Run.

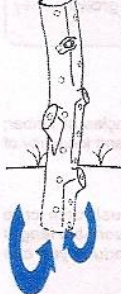
The Spawn Run

The aim of the spawn run is to achieve full colonisation of the timber with mushroom mycelium, so that when the right weather conditions are encountered, mushroom production, or *fruiting* can begin. The spawn run takes anything from 6 to 24 months (or at least one spring/summer season). The duration is dependent upon the size of the timber and also the tree species—the larger the diameter, and the denser the timber, the longer the spawn run will take.

So, to produce a good healthy crop of mushrooms, the mycelium has a source of food and access to water; the wood contains plenty of nutrition—in the form of lignin and cellulose—and freshly felled timber has a good moisture content (between 35% and 65% depending upon the species). The mycelium also needs heat to grow. It grows fastest during the summer months when temperatures rise above 15°C, and almost stops when temperatures fall below 5°C.

To start and keep the mycelium growing healthily, a suitable location needs to be found which will benefit the spawn run. At all times, the timber needs to be sheltered from strong winds and direct sunlight, thereby preventing moisture through evaporation. If the timber dries out, the mycelium will almost certainly die, and no mushrooms will be produced. Rooted tree stumps are ideal as moisture is still drawn up by the roots, which also provide extra nutrition for the mycelium.

A sheltered garden should provide many places to home the timber. Anywhere that is normally damp, dark, fully shaded from the sun, and sheltered from winds is ideal. It may help to think of your log(s) or round(s) as like a **shade loving plant**. Choose areas that are shaded for most of the day (preferably but not exclusively north facing). In a shady corner, amongst shrubs, or in a well established hedge. Anywhere that can provide protection from winds, and strong and direct sunlight.



Planting the Log(s)

After choosing a suitable site, plant each log vertically soil, or compost, at a depth of up to one third of its length, as pictured left. Logs can also be planted into containers filled with compost. Planting will help draw up moisture from the surrounding earth, which in turn will help replenish any moisture the log loses to natural evaporation. Logs with the same species can be planted touching to form a fence, but remember to leave a 6" space (15 cm) between different mushroom species.

Siting the Rounds

Once drilled, the rounds are stacked two high. The bottom round's plugged face should be in good contact with the un-plugged face of the top round—refer to the diagram on the previous page. Rounds can be simply placed on the ground, ensuring a good contact is made with soil.

First Signs of Growth

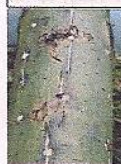
Several weeks after plugging a white to off-white ring can be observed around the plug site (left), indicating that the mycelium has begun to grow through the timber. Six months to a year later, white, 'cottony' mycelium should also begin to appear in star shaped patches at the cut ends of the log(s), as pictured below, right.



Plug site close-up

Rounds will 'stick' together as the mycelium grows from the bottom round into the top round, and mycelium will become visible where both faces meet.

By the end of the first summer growing season, mycelium should be clearly visible running up and down the cracks and fissures in the bark, and also just under the bark (below, left).



Mushroom mycelium growing down the cracks in a six month old willow log

Keeping the Mycelium Healthy and Growing

During dry summer months water your timber along with the rest of your garden plants. Two minutes in the morning and evening will help keep moisture levels topped up. Wet top and sides using a watering can, making sure the wood gets a good drenching.

As long as the wood is prevented from drying out by watering in dry spells, the mycelium should spread throughout and fully colonise the timber. Feeding upon the lignin and cellulose as it grows, the mycelium is building up energy ready to begin fruiting.

Only a competitor 'weed' mushroom will prevent this happening. If, after 6 months of spawn running, there are no visible signs of mycelium, then a competitor has most likely put a stop to things. Please get in touch via email or website to request replacement plugs.



Mycelium growing out from a plug site on the face of a poplar round.



Picking & Preserving



First, make sure it is the right species of mushroom that you are picking. Pearl Oyster mushroom is commonly known as the 'Tree Oyster', *pleurotus ostreatus*. It is native to Europe, and is easy to correctly identify. There are very few poisonous mushrooms which look similar. These species are rare. The photos throughout this booklet will normally suffice, however cross-reference with photos online if unsure.

Pearl Oyster mushrooms normally grow in clusters numbering anything from 5 to 25 mushrooms. There will be different sizes within the cluster—some mushrooms will be larger whilst others will be smaller. The ideal size to crop oyster mushrooms is when the caps measure between 6 and 12 cm (3 to 6 inches), and have flattened out, but are still slightly rounded (as pictured above, left).

Picking is a quick and simple task which is best undertaken with a knife having a short, sharp blade. Care must be taken—**fresh mushrooms damage easily**. It is best to remove clusters as a whole by gently holding a cluster with one hand, so as to gain access to the stems at the rear. Cut away at the base of the cluster as close to the bark as possible, whilst still supporting the cluster with the other hand as the mushrooms come away.

Baskets are best at carrying your crop. Use plastic bags only if no other means are available. Clean off any remaining stem from the log using the back of the knife. Keep site clear of mushroom debris, discouraging the unwanted interests from pests.

If required, wipe clean with a slightly damp cloth. Trim stem debris and store refrigerated at 1°C to 5°C, in **cardboard or paper**, for a maximum of 14 days after picking. Fresh mushrooms can be compared in storage terms to fish. Mushrooms can be frozen, however the texture can be altered in the process of doing so.

Dried mushrooms can be preserved for up to 18 months providing an air tight container is used. Air dried at 70–80°F (20°C to 28°C) for 24 to 48 hours. Tearing the mushrooms into strips will greatly speed up the drying process. Mushrooms can also be pickled in vinegar, much the same way as vegetables.

The Next Flushes of Mushrooms

Pearl Oyster normally flushes twice per year, in Spring and Autumn, so can be considered a bi-annual. However, if beneficial weather conditions are encountered, there may be more. Remember to check the timber when temperatures fluctuate and also during periods of prolonged and heavy rainfall.

The overall lifespan of the timber is dictated it's size of the timber, and also the tree species:

Tree Species	Diameter of timber	
	20 to 30 cm (8 to 12")	30 to 100 cm (12 to 48")
Oak, Hornbeam, Alder	3 to 5 years	5 to 10 years
Ash, Beech, Birch, Chestnut, Hazel, Maple, Poplar, Sycamore, Willow	2 to 3 years	3 to 7 years

Dense hardwood tree species, like oak, alder or hornbeam, flush for longer when compared to softer hardwood species like willow, poplar, or birch. Also, the wider and bigger the timber, the longer flushes will be sustained for. However, please bare in mind that it is very difficult to predict the longevity of the flushes as there are a myriad of factors which have influence over this.

Fruiting—1st Flush of Mushrooms

Once the wood is fully colonised with mycelium that is clearly visible in at least one of the following places: around plugs sites; at the log's cut ends; where one round meets the other (right); and running down cracks in the bark. The mycelium now has enough resources to produce the first crop, or *flush*, of mushrooms, and is waiting for the natural signal to begin fruiting.



Fruiting is triggered by fluctuations in ambient temperatures, accompanied by heavy and prolonged rainfall. These weather conditions are normally encountered when the seasons change; *Spring to Summer*; *Summer to Autumn*; *Autumn to Winter*; *Winter to Spring*.

The mycelium is looking for a prolonged period of settled warm weather, followed by a period of unsettled colder, damp, rainy weather. For example; a 20 cm diameter log inoculated in March, fully colonised by August—the autumn weather change will most likely trigger the first flush.

What to Look Out For



Primordia at the intersection between 2 rounds



Primordia 24 hours after forming round a plug site. Background: 3 day old mushrooms

Check the timber **daily** (morning and evening if possible) after the aforementioned weather conditions have been encountered. **Primordia**, the term used for minute immature mushrooms, form overnight (pictured below, left) over a period of 2 to 3 days. These miniature mushrooms start life hidden in the thin layer between the sapwood and bark. Clusters begin to appear in the rough terrain of the bark, and emerge resembling off-white pinheads measuring from a few millimetres in diameter. Doubling in size daily, primordia darken to a light tan to brown colour in a day.

Primordia form in clusters of up to 25; around plug sites, at the gap where 2 rounds meet, in the cracks and fissures up and down the bark, and also on the exposed face of a log, stump, or round.

Caring for the Primordia

Primordia are vulnerable to warm, dry weather and to climbing pests. Check the timber morning and evening. If warm dry weather is encountered during primordia growth, spray 2-3 times a day with a household plant mister, or water lightly with a watering can. If wet weather is encountered slugs and snails will most likely be a problem, and are capable of spoiling an otherwise healthy crop (right). Logs and rounds can be up-rooted, planted into a container, and moved to an indoor location to protect against slugs and snails, insects, and also rodents, but do ensure it is somewhere there is enough light to read these instructions.



A log left uncared for....

Caring for the Growing Mushrooms

Care for the developing mushrooms in the same way as for the primordia. Primordia mature into small mushrooms in 2 to 3 days. Mushrooms then reach maturity in another 3 to 5 days. **Observing the growth process is both fascinating and rewarding.**

Enjoying Pearl Oyster Mushrooms...delicious recipes

Per flush, the timber is capable of producing, between 125g to 225g of mushrooms (1/4 to 1/2 lb.) per 30 cm (1 ft) length of hardwood with a 15 cm (6 inch) diameter. Drying excess mushrooms is the best way to preserve them over longer periods.

Pearl Oyster, Leek & Ale Pie

This pie can be made using pastry, or topped with mashed potato (shepherd's pie style)

Ingredients
1 onion
450g leeks
450g oyster mushrooms
250ml ale (eg Theakstons, Black Sheep)
1 tsp yeast extract
1 tsp tomato puree
30g flour
oil, butter or margarine for sauteing
1/2 tspn sugar
225g garden peas (can use frozen)
soy sauce (dash)
Salt, 1/2 tsp mixed herbs (optional)
pepper
250g puff pastry OR 500g potato (cooked & mashed)

Preparation
Chop the onion & slice the leek, then sauté gently in oil until soft. Add the mushrooms, yeast extract, tomato puree, sugar & soy sauce. When the mushrooms have released their juices, slowly stir in the flour to make a roux. Stir in the stout. If the mixture appears very thick, add a little water. Bring to the boil and add the peas. Simmer for about 5 minutes. Place mixture in pie dish. If using pastry, roll out to a round just larger than the dish. Brush the top of the dish with oil, cut out a pastry strip & press on to the dish. Brush this with milk. Place the pastry sheet on the dish, pressing the edges down so that it sticks to the pastry strip. If using potato, mash it roughly and season with salt, pepper and mixed herbs (if using). Place potato over the pie mixture. Place in pre-heated oven and bake at 425degF/220degC/gas mark 7 until pastry has turned golden brown and puffed up (approx 20 minutes), or potato has turned golden on top (approx 20 minutes). Serves up to 6.

Pearl Oyster Mushrooms with Sesame Seeds served on Wholemeat Toast

Ingredients
125 – 250g oyster mushrooms (1/2 to 1/4 lb.)
2 tbspsn of sesame seeds
1 tbspn olive oil, butter or margarine
salt, pepper, chopped garlic, soy sauce – any or all of these
Wholewheat bread

Preparation

Trim mushroom stalks, and tear the mushrooms into strips. Cook over a medium-high heat until mushrooms are softening, and any excess liquid has evaporated. Add the sesame seeds and your choice of condiments – chopped garlic, salt, pepper. Reduce the heat and continue to cook until the mushrooms are golden brown and slightly crispy (to taste). Serve on your lightly-toasted Wholewheat bread. This method of cooking is a good all-rounder: your stir-fried oyster mushrooms could also be added to a main meal as a side portion, used as a pizza topping, or as a filling with salad in a pitta bread.

Pearl Oyster Mushroom Risotto

Ingredients
1 onion, chopped finely
1 courgette, diced
100g baby sweetcorn, cut into strips
1/2 red/orange bell pepper, diced
225g risotto rice
150ml white wine
1 tspn olive oil
600ml vegetable stock
50g butter or margarine
225g oyster mushrooms (1/2 lb)
1 garlic clove (optional)
2 tbspn fresh, chopped herbs
soy sauce (dash), sea salt, black pepper

Preparation

Heat the olive oil in a (preferably) heavy-bottomed pan. Add the chopped onion, the pepper and the courgette and cook until soft. Add the sweetcorn and stir. Add the risotto rice to the pan and cook for about 1 minute. Add the wine and cook until it has nearly evaporated. Gradually add the vegetable stock. Simmer gently, allowing the stock to be absorbed before adding the next bit. Try not to swamp the rice! Continue until the rice is tender, then season with salt & pepper. In a separate frying pan, melt the butter or margarine, then add the oyster mushrooms. Fry, stirring often, until the mushrooms are softened and golden brown. Oyster mushrooms tend to have varying water content: if they are releasing a lot of water, wait for most of it to be evaporated off before seasoning. Add soy sauce to taste if you are using garlic, add it (chopped finely) just before the mushrooms are cooked. Do not let it turn brown, because it will become bitter. Serves up to 6.

Feedback, Comments, & Photos

We're always interested in hearing about your mushroom growing experience. If you feel there is anything in these instructions that we've missed out, or should miss out, or that we haven't explained very well, please let us know. Send photos, recipes and comments to the contact details at the front.