

# ROOTLAB

## Mycology made easy

V 1.4

If you are a beginner or unsure how to use this product, please read the detailed information sheet below.

### SAFETY FIRST

**This Rootlab product is not suitable for the small percentage of people who are allergic to mushroom spores.**

**As spores are small and lightweight, it is not recommended to grow them in the house (especially the Reishi variant) as spores will spread, if you mind clearing after them.**

**If bags start to contaminate, they should be discarded immediately by wrapping up in a plastic bag and disposing of in a general waste bin.**

### Storage prior to inoculation:

Take the bags out of their packaging as soon as possible, unfold them, and store them unfolded in a well-ventilated space (dark or light). This allows the grains access to fresh air through the air vent filter, preventing anaerobic conditions that result in mould or bacteria thriving inside the bag. If the air vent filter is stuck or pressed against plastic, loosen it so the grains can access fresh air.

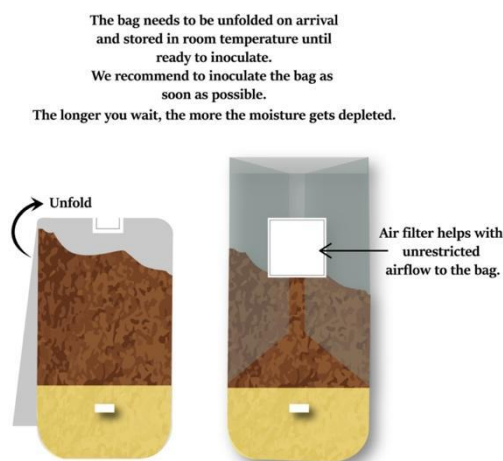
Please ensure that you have all equipment required (such as Liquid Culture/spore syringe etc.) before ordering the bags.

### Summary - storage before inoculation

- Wash your hands.

- Remove bags from packaging, keeping upright.
- Loosen the bag by removing the tape. (This tape secures the substrate during shipping.)
- Ensure that air is entering the bag through the air filter.

Store the bag at room temperature in a well-ventilated light or dark place. It will stay fresh for at least 1-2 weeks. No need to refrigerate. The Fully colonised bag can be refrigerated until ready to fruit.



## **WE'RE HERE TO HELP**

The Rootlab Mushroom Kit is not like the other kits. You are nurturing your fruit from the beginning, so you may find you need a little help along the way. We're just an email away! Shoot us a message at [info@rootlab.com.au](mailto:info@rootlab.com.au), including a photo if you can – and we'll get back to you within a few hours.

Please – we'd love to see photos of your successful growth and to hear any feedback you may have.

And be prepared to get addicted – once you've grown your first batch of mushrooms, you'll want to try **ALL** the mushroom varieties in the Rootlab range.

Please also report any contamination within two weeks of receipt of the bag

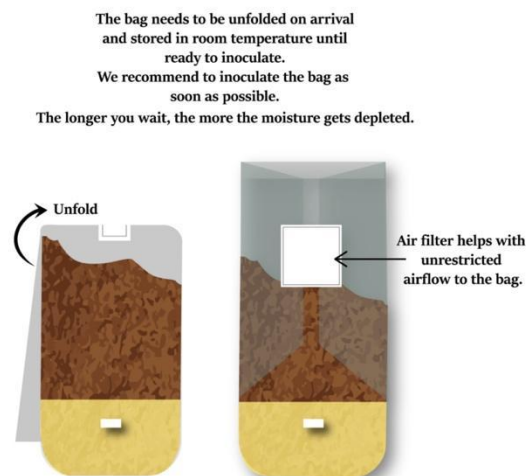
## **YOU WILL NEED**

- Mask
- Gloves
- Flame source (lighter or match)
- Misting bottle filled with boiled and cooled water
- Knife

Rootlab Mushroom Growing Kits have been sterilised in a pressure cooker at 121°C at 15 psi to ensure that the kit is free from living organisms and their spores.

The kit can be stored for 1-2 weeks. If not inoculating immediately, remove the tape and store the bag at room temperature in an upright position to allow for air exchange.

Store the syringe in a zip lock bag in the veg compartment of the fridge (away from direct fan). Pink Oyster and Yellow Oyster culture can't be stored in the fridge.

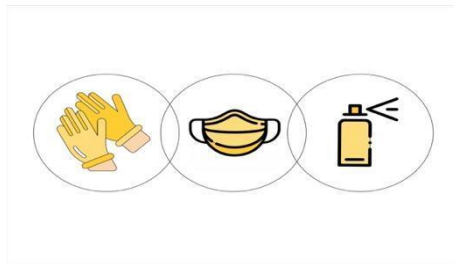


## MUSHROOM GROWING STEPS

### IMPORTANT

- 🍄 Maintain a sanitised environment.

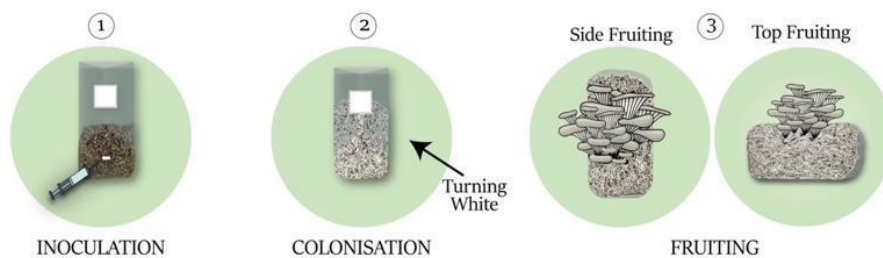
To successfully grow kit mushrooms, a very sterile environment is required. It is impossible to simulate the mushroom's natural ecosystem therefore, a sterile environment is required to support growth. Sanitise the environment with 70% isopropyl alcohol (available at hardware stores) or a multipurpose cleaner.



- 🍄 Wear a mask and gloves.
- 🍄 Inoculate mushrooms in an area with minimal airflow.

### LET'S GET STARTED!

#### Stages of growing



#### 1) Inoculation (*introducing the mycelium to the nutrient medium*):

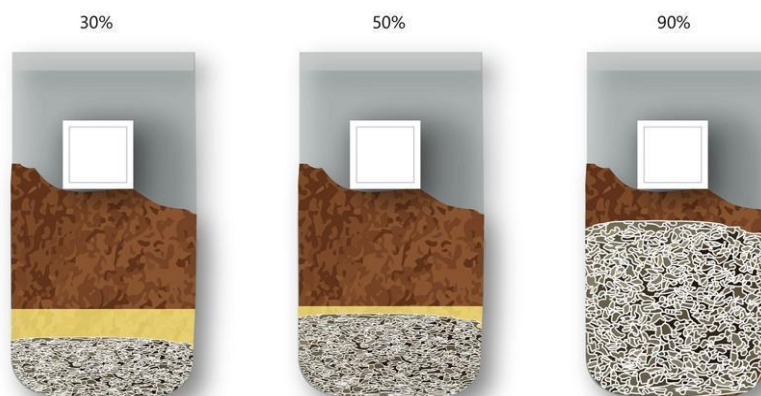
- Before you start, check the bag for any contamination, leaks or holes.
- Wipe your gloves and the injection port with an isopropyl swab.
- Shake the syringe hard to break up the mycelium inside it.
- Take the cap off the syringe and fit the needle onto the tip. Be careful not to touch the end of the needle with your hand, as it needs to stay sterile.

- Do not push the needle all the way in. Only insert it a few centimetres so the liquid can spread inside the bag. Do not change the angle of the needle once it is inside, as this leaves a large hole in your self-healing injection port.
- Remove the needle and gently turn the bag in every direction. This lets the liquid travel all the way around the bag so it spreads evenly over the grains. Do not shake it hard or mix the substrate through the grains at this stage.
- It is fine if some of the liquid also runs down towards the substrate. You want the whole bag to colonise in the end anyway, so a bit of spread is a good thing.
- The grains are full of nutrients, so getting the mycelium onto them gives it a great head start and helps it colonise faster.
- Move the needle straight in and straight out, the same way a doctor gives a vaccine. Never move the needle around to steer the liquid. If you have done this, cover the hole with tape, because a large hole can let contamination in. Pushing the needle too far into the bag can also cause the plastic part at the end of the needle to make a big hole.

## 2) Colonisation (*mycelium growth - no mushrooms present*):

- Immediately after inoculation, incubate the bag at approximately 24°C in a dark spot for approximately two weeks.
- When the bag is 50% colonised, break the bag with clean hands to distribute the mycelium evenly around the entire substrate block.
- Taking your time, gently shake the bag. This process mixes the grains and substrate evenly. Be careful of the heat-sealed top part of the bag as it may tear if too much pressure is applied. We shake the bag three times during the colonising process to assist the mycelium to colonise evenly.
- Return bag to dark spot for another 2-3 weeks (until fully colonised).
- **Do not place the bag on a heat mat to keep it warm, as this will cause all moisture in the bag to evaporate.**
- Please prioritise a place with plenty of air exchange over a dark spot.

Shake bags at these stages of colonisation:



### KEEP IN MIND:

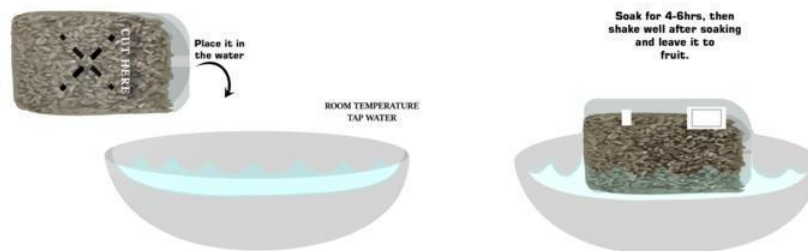
After two to four weeks, the substrate will be completely white with no uncolonised substrate left. It is a good idea to take note of what the average storage temperature was and how long colonisation took, for future reference.

If a fully colonised bag is not used (i.e. put into fruiting) within two weeks, the vigour of mycelium will start to diminish and die off from day 14. If not fruiting immediately, we recommend storing the bag in the fridge. Note that Pink oyster and Yellow oyster varieties should not be stored in the fridge.

As the colonised bag ages, a yellow liquid will be produced. This is called mushroom pee, and it is a sign that the mycelium is stressed or old. These natural metabolites will not harm your produce, but it signals that the mycelium is no longer at its optimum health and could be susceptible to contamination.

### FRUITING YOUR BAG – THE FUN PART!

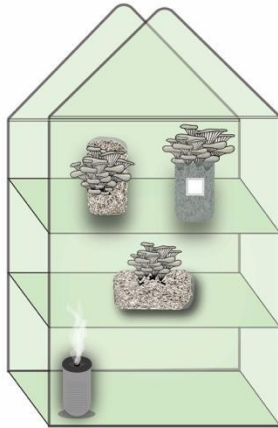
Mushrooms are 90% water. During colonisation, the mycelium consumes all the water in the bag. We need to give the mycelium another good soak before they fruit.



Soak the bag in room temperature water for 4-6 hours. The mycelium will soak up all the water it needs.

**Recommended place for fruiting:** - Somewhere humid like a laundry room or a greenhouse.

GREENHOUSE SETUP



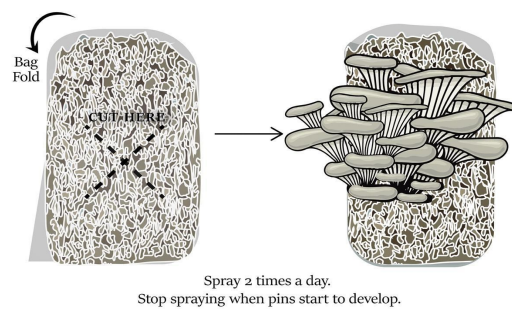
### 3) Fruiting (*mushrooms start to grow from the mycelium block*):

- Mycelium dies when it meets a dry surface; therefore, it is essential to maintain humidity.
- Humidity induces pin formation (baby mushrooms), which is a key factor for mushroom growing success.
- Mist twice a day with boiled and cooled water. Stop spraying when the baby mushrooms form.
- Depending on the mushroom variety, fruiting will occur in one of two ways - "Side Fruiting" or "Top Fruiting".

#### **For side fruiting varieties:**

- Side fruiting varieties can be fruited directly from the bag by cutting an "X" in the middle of the bag.
- Ensure proper humidity of 80-85% is maintained by misting twice daily.
- If in doubt about the level of humidity, place them in a shotgun fruiting chamber. Instructions on how to make a fruiting chamber can be found on YouTube.
- You can also place side fruiting varieties in a greenhouse tent with a small humidifier to help with fruiting.

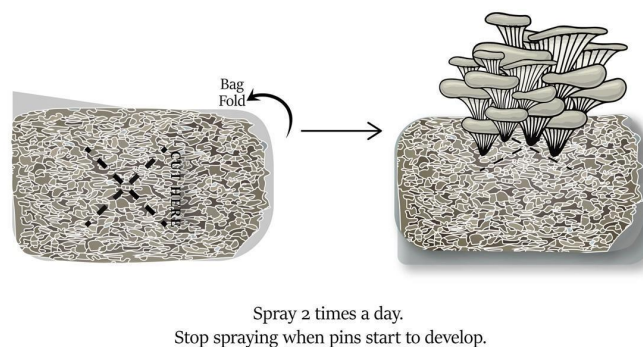
## Side Fruiting



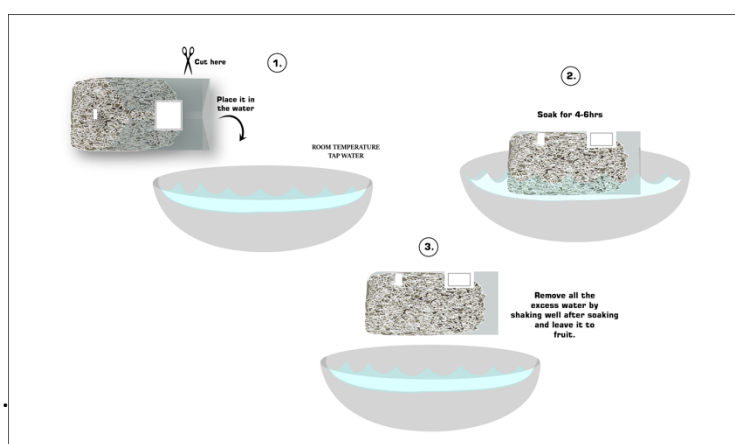
### For top fruiting varieties:

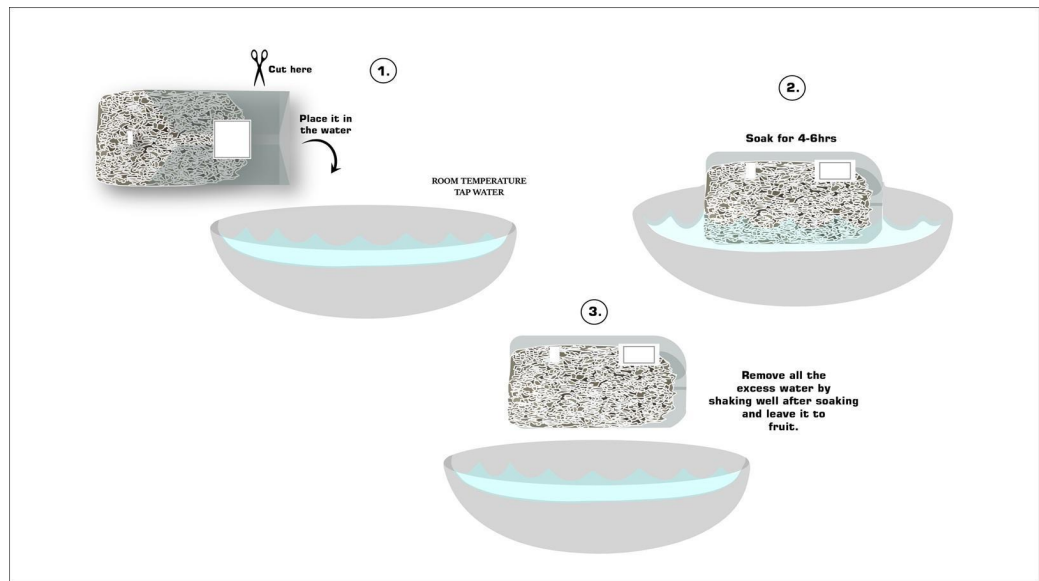
- Top fruiting varieties can be fruited directly from the bag by cutting an "X" in the middle of the bag and laying it sideways, as pictured below.
- Ensure proper humidity of 80-85% is maintained by misting twice daily.
- If in doubt about the level of humidity, place them in a shotgun fruiting chamber. Instructions on how to make a fruiting chamber can be found on YouTube.
- You can also place top fruiting varieties in a greenhouse tent with a small humidifier to help with fruiting.
- Some species like Oysters can be fruited side or top.

## Top Fruiting

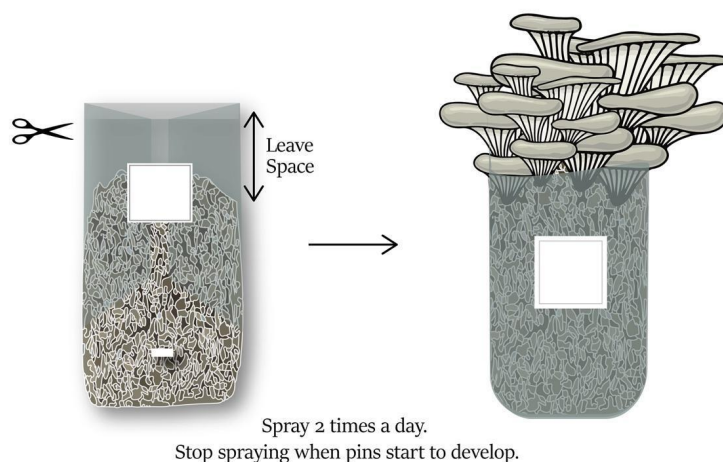


If growing Enoki or Golden Enoki mushrooms, cut the bag directly below the heat seal on top and hydrate as shown in the picture below. Note that traditional Enoki looks very different to what we are used to seeing in supermarkets. Instead of long thin strands, they look exactly like oyster mushrooms. If you want to grow them long and thin, use the below method.





## Top Fruiting



### 4) Mushroom harvesting:

- If you have followed *Steps 1- 3* carefully, you will have mushrooms ready to harvest after approximately 2 -3 weeks.
- Once they are at their optimum size, harvest the mushrooms by removing the fruit completely. A mushroom's life cycle is 3-5 days. It is important to harvest before the mushroom cap (if it has one) turns up, as this is when the mushroom will sporulate. Caps will turn up by around day 4. Knowing when to harvest the mushrooms will come with experience.
- Remove residual parts of the mushroom using a sanitised knife from the fruiting block to avoid contamination and allow for a second flush.
- Mushroom growth is a 3-7 day life cycle. Mushrooms need to be harvested in this time before they go into spores. If they go into spores, they are still consumable

but won't have a very long shelf life. It is best to consume mushrooms immediately.

- Mushrooms can be stored in a paper bag in the veg compartment of your fridge.

#### **5) Obtaining a second flush (harvest) of mushrooms:**

- Once the first flush has been removed, you can prepare the block for a second flush.
- Simply soak the mycelium block in a bowl of fresh water at room temperature for 4-6 hours.
- Remove the block gently and thoroughly shake.
- Return the kit to the growing area and refer to *Step 3*. However, this time check constantly for contamination as the fruiting block will have lost some of its immunity during the first flush.
- It is possible to obtain a third flush; however, the chances of contamination are higher as the mycelium ages.
- Compost the mushroom block, throw them in the garden or simply discard them after the mycelium has run its course.

#### **ENJOY!**

Brush your mushrooms gently with a paper towel – do not wash – and toss them into your favourite stir fry, pasta or salad. Remember to cook them well!

The mushroom's nutrition is contained in a protein called Chitin - the same protein that lobster or crab shells are made of. Mushrooms really need to be cooked well to break this layer and release all nutrition - they are one of a few food groups that can't be overcooked.

## GLOSSARY

Important words to know before you proceed.

**Colonisation** - The stage in which mushroom mycelium spreads its roots all over the substrate, similar to a plant putting out its roots.

After the substrate is colonised, the mushroom secretes enzymes to break down the substrate so that it can be absorbed by them.

Colonisation requires a warm temperature, around 24°C for most species. Too hot and the contamination thrives; too cold and mycelium metabolism slows down drastically.

**Fruiting** - Mycelium has fully colonised a substrate and, with nothing else to do, directs its energy towards the propagation and keeping its genes alive. They form mushrooms that are fruiting bodies with spores. Every species requires a specific temperature and humidity to fruit.

**Incubation** - the process of placing the mycelium in the perfect temperature and darkness to colonise.

**Inoculation** - The stage in which mushroom culture is introduced to a nutrient medium. The culture is usually contained in a nutrient liquid in a syringe or a nutrient agar petri dish.

**Mycelium** - A root-like structure of fungus that spreads, looking for water and food. Once mycelium gains sufficient energy from the food, it will fruit. This fruit is what we call mushrooms.

**Pasteurisation** - Different chemicals or steam are applied to a substrate, killing all organisms but not the spores (most of which remain alive). Pasteurisation occurs at a temperature of 75°-78°C.

A pasteurised substrate will contaminate in two weeks as spores that were not killed off during pasteurisation will grow, mate and compete for food.

When mycelium takes over a substrate introduced via grain spawn, they fully colonise the substrate and then secrete enzymes to prevent contamination.

FUN FACT: Penicillin is the most common antibiotic - an enzyme secreted by the fungus to ward off bacteria.

**Sterilisation** - The substrate or grains are put under extreme heat (121 °C) and immense pressure (15 psi), killing all organisms and their spores.

**Substrate** - Food for mycelium. Just as plants need nutritious soil to grow in, mushrooms need wood, manure/compost, straw or insects.

FUN FACT: Mushrooms that naturally grow in insects are called parasitic mushrooms; the most common example is Cordyceps.

## Appendix A: fruiting chart

Growing mushrooms outside their fruiting temperature would lead to no growth or deformed mushroom.

| Mushroom Species/Strain         | Fruiting temperature | Side or top fruiting | Comment                                                                                                                                          | Difficulty |
|---------------------------------|----------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Yellow                          | 20° - 30°C           | Both                 | Will only fruit in Summer. Do not keep liquid culture syringe in fridge as it is a tropical species and mycelium dies when exposed to cold.      | Beginner   |
| Pink                            | 18° - 30°C           | Both                 | Will only fruit in Summer. Do not keep the liquid culture syringe in fridge as it is a tropical species and mycelium dies when exposed to cold.. | Beginner   |
| Pearl Giant (Giant Blue Oyster) | 20° - 30°C           | Both                 | Colonises quickly but takes a long time to fruit.                                                                                                | Beginner   |
| Phoenix                         | 14° - 24°C           | Both, best from side |                                                                                                                                                  | Beginner   |
| Black King                      | 15° - 21°C           | Top                  |                                                                                                                                                  | Medium     |
| Coral Tooth                     | 12° - 20°C           | Both, best from side | Very easy to fruit. Ensure correct humidity to prevent fruit yellowing.                                                                          | Beginner   |
| Lions Mane                      | 12° - 22°C           | Both, best from side | Very easy to fruit. Ensure correct                                                                                                               | Beginner   |

| Mushroom Species/Strain | Fruiting temperature | Side or top fruiting                             | Comment                                                                 | Difficulty |
|-------------------------|----------------------|--------------------------------------------------|-------------------------------------------------------------------------|------------|
|                         |                      |                                                  | humidity to prevent fruit yellowing.                                    |            |
| Swordbelt               | 10° - 18°C           | Top                                              |                                                                         | Beginner   |
| Winter White            | 12° - 22°C           | Both                                             |                                                                         | Beginner   |
| Chestnut                | 12° - 21°C           | Top                                              | Hard to fruit without proper humidity atleast 95%                       | Advanced   |
| Nameko                  | 10° - 20°C           | Top                                              |                                                                         | Medium     |
| Golden Enoki            | 17° - 21°C           | Top fruiting as shown in the instructions above. |                                                                         | Medium     |
| Enoki                   | 8° - 12°C            | Top fruiting as shown in the instructions above. | Can be fruited by refrigerating bag as it thrives in the cold.          | Beginner   |
| Blue Pearl Oyster       | 15° - 20°C           | Both                                             |                                                                         | Beginner   |
| Giant King Oyster       | 15° - 20°C           | Top                                              | Will only grow in winter, or cold temperature.                          | Medium     |
| Tan Oyster              | 15° - 24°C           | Both                                             |                                                                         | Beginner   |
| Reishi                  | 23° - 25°C           | Side                                             | Produces lots of spores. Takes a long time to fruit but colonises fast. | Beginner   |
| Turkey Tail             | 13° - 16°C           | Both, best from side                             | Only fruits in winter. Takes a long time to fruit.                      | Medium     |
| Princess Pearl          | 12° - 29°C           | Both                                             |                                                                         | Beginner   |
| King of Pearl           | 10° - 30° C          | Both                                             |                                                                         | Beginner   |