

Growing Rimurimu Experiment

Creating a nursery for underwater forest

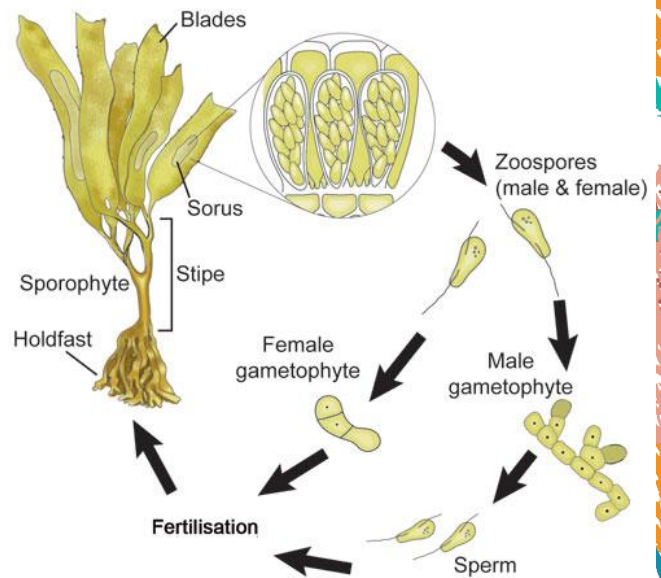
Equipment needed

- Fish tanks
- Sealed containers (for spore solution)
- Trays
- Oxygen bubbler (water movement for spores)
- Water pump (water movement for larger seedlings)
- Seawater for replacement (from planting site)
- Pipettes/droppers
- Rope, rocks, or desired growth medium
- Strong lamp/light
- Fish tank cleaning magnets
- Seaweed spores (*Lessonia*, *Ecklonia*, *Macrocystis*)
- Petri dishes
- Microscopes (x1300+ magnification)

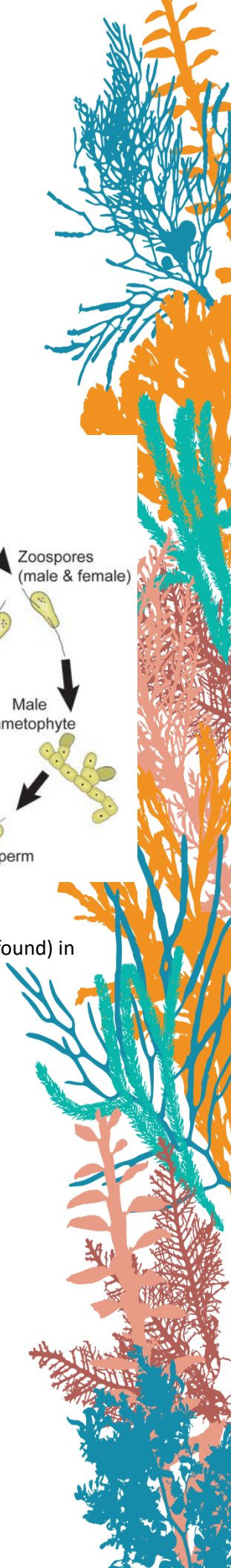
Method

Releasing spores

1. Collect fertile, reproductive parts of seaweed. Look for a slimy, smooth sorus (where spores are found) in the middle of the blades. If the sorus feels rough, it has already released its spores.



Sori found in *Ecklonia* and *Lessonia* blades.



2. Stress the sorus. Stress will induce spore release; seaweed can be stressed by drying, cutting into pieces, or shaking in solution.



Stressing the spores out of the sori.

3. Keep the stressed sorus in seawater solution for approximately 1 day. By the end of this resting period, pick out the seaweed pieces and you will have a murky, brown solution full of spores!



Ecklonia spore solution.

Settling spores

4. Settle spores onto your chosen growing medium (you can try string/rope/rock). Place growth medium in a tank. Pour the spore solution into the tank until the growth medium is completely submerged. Add some fresh seawater to dilute spore solution.



Growth medium set up (left) and pouring spore solution into container (right).



Note: When using rocks or other natural growth mediums, make sure to boil and dry (sterilise) these objects to avoid growing any undesired spores/larvae attached to them.

Keeping spores healthy

Every day:

- ✓ Check water temperature stays between 10 and 20 degrees Celsius. Make sure tank is receiving at least 8 hours of light. Place tank near a north facing window and away from any radiators.

Every week for first 4 weeks:

- ✓ Keeping healthy water. Add about a litre of fresh seawater from the release site. Important to use water from planting site to avoid transporting pests between locations.
- ✓ Clean tanks walls to remove any algae growth and allow proper light penetration.

Every week after month 1:

- ✓ Replace half a litre of tank water with 1 litre of fresh seawater.

The table provided at the end will help you track maintenance checks.

Important factors to consider

- Growing timeframe - 2-3 months until seedlings appear.
- Light and temperature-controlled environment need to keep water temperature constant within the range (may require salt tolerant heaters in winter time) and regular light cycles (either 12hr light/12hr dark or 8hr light/16hr dark).
- Water motion - important for water chemistry, nutrients, temperature control and breaks layer of seawater on surface of algae. Can be achieved by air bubblers to begin with (small size and water volume). Pump will be needed for larger sizes.
- Winter fertile species: *Lessonia variegata*, *Ecklonia radiata*, *Macrocystis pyrifera*.
- Macroalgae - more appropriate as declining species and faster growing.
- Important to consider where species will be transplanted to. Need to grow species that would naturally occur there. Also, important to use water from final site to avoid introducing species from other areas.
- To eliminate alien spores/larvae, rinse sori with Iodine solution and then freshwater again twice before stressing and used filtered seawater (optional).

