

South African Kelp Farming Project (Phase 2 Feasibility study)

Standard Operating Procedure (SOP): Settling the spores onto the spools

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Compiled by:

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on behalf of BSASA

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Review date: to be adapted and revised by industry

Introduction

The overall goal of the South African Kelp Farming Project (SA KFP) was to gather, analyse and disseminate evidence and research results to a broad stakeholder base, including the existing aquaculture industry and new potential entrants, to lay the foundations toward building a sustainable Kelp Aquaculture Industry in SA and the region.

One of the project objectives was to investigate and tailor the hatchery and nursery methods for our local kelp species (based on the kelp farming manuals from elsewhere that are already publicly available and accessible on the [SA KFP webpage](#)), which can then be adapted and revised by industry to suit their own needs. Although the temporary set-ups that were used in Phase 2 of the SA KFP were aimed at achieving the short-term project objectives, it was the first successful attempt to cultivate *Macrocystis pyrifera*, *Ecklonia maxima* and *Laminaria pallida* in South Africa, and also the first successful attempt to cultivate *E. maxima* and *L. pallida* anywhere.

Purpose of SOP:

The purpose of this SOP is to provide a breakdown of steps required to setting up spools and inoculating/settling the spore solution onto the spools which will be placed in jars/tanks (see SOP 6). This procedure should preferably be executed in a temperature-controlled room of $\leq 15^{\circ}\text{C}$.

Preparation of workspace:

1. While wearing powder-free surgical gloves, clean and sterilise the work surface and make sure enough paper towels are available.
2. Sterilize all utensils and glassware that will be needed for the procedure.

Preparation of spools:

1. With surgical gloves, collect the previously prepared PVC spools.
2. To start wrapping, secure the twine to the bottom end of the spool with a cable tie (or alternatively cut a slit into the spool and make a knot at the end of the twine and slide the twine into the slit), wind the twine around the spools without any twine overlapping and without leaving gaps between the twine. Once done, secure the twine at the top end with a cable tie.
3. Sterilise the PVC spools wrapped with twine in the UV steriliser before use.

Note:

Using the dimensions as per SOP1, we were able to fit 15-16m of hatchery twine onto the spools which were enough to cover two 6m droppers.



Preparation of sterilised seawater:

1. To sterilise filtered seawater, one can either use an autoclave or tyndallization can be used.
2. Either way, one must be mindful that the cooling off process of the water to 15°C takes quite a while so this could also be done the day before to save time.

Preparation of settling canisters (for the 24hr dark period):

1. With surgical gloves, carefully clean (first with 70% ethanol/isopropyl alcohol, then distilled water and then sterilised seawater) the canisters that were prepared previously.

Inoculation:

1. Sterilise all utensils to be used during the inoculation.
2. Mark the spools clearly on the inside of the spools with a convenient numbering system for tracking purposes from the hatchery/nursery to weaning/grow-out.
3. Number glass slides as per the spools above and place each slide at the bottom of the canister followed by the corresponding spool. The purpose of the slide is to track the developmental stages on the slides as an indication of what is happening on the spools (but is optional).
4. Add 15°C sterilised filtered sea water to just above the twine on the PVC spool, add the spore solution as per calculation, mix and top up with 15°C sterilised filtered sea water, if necessary.
5. If more than one species is to be inoculated, repeat the above for each species.
6. Lightly place the screw lids on top of the canisters and let it stand over night for 24 hrs. During this time, the spores will settle on the twine.



Cleaning workplace after spools were inoculated:

1. Clean the workplace and discard in the appropriate manner all used paper towels and gloves.