

BIM EMFAF Work Programme Project Report 2022

BENEFICIARY:	Bord Iascaigh Mhara
PROJECT REFERENCE NUMBER:	22/KGS/STS-BG010-BR058
NAME OF PROJECT:	Seaweed Development Services
IMPLEMENTATION PERIOD:	1st January to 31st December 2022

Project Scope

Seaweed has been identified by DG Mare in its blue bioeconomy road map and in this regard the EU is to provide support to algal development activities to enable a strong and sustainable EU algal sector to provide for the following objectives: large scale production, support funding, improved business environment, social awareness and acceptance and closure of knowledge and innovation gaps. The target is to develop an ambitious, useful, modern, and relevant EU algal initiative under the EMFAF Programme. The increased interest in seaweed cultivation in Europe created challenges for the sector to add value to raw materials. Increasingly, its immediate future is defined as a provider of biomass for high value-added products, differentiated from the wild harvest sector.

This project seeks to develop and support the nascent Irish seaweed aquaculture sector.

Objectives

- *Saccharina sori* induction, chlorination (sterilisation) and sporulation, active and passive seeding, spring/summer deployment for sea growth trials to enable a summer crop.
- Conduct survey for new asexual Porphyra stock on north coast/sporulate plants and settle on media.
- Alaria production on collector string via industry mentoring to enable continued growth trials at sea during autumn.
- Technology transfer for all interested industry participants in-person and/or via webinar/video as required.
- Hatchery production step by step guide on cultivation techniques.
- Hatchery blueprint suggested design plus associated costs.
- Sea-site blueprint suggested design plus associated costs.

Outcomes

Seaweed sporulations were conducted by CPS up to the end of April 2022. Ripe *Saccharina* was collected at two sites on the Mizen Peninsula and the Beara peninsula. Ripe *Alaria sori* were harvested at a site adjacent to BMRS and from the BMRS seaweed farm in Bantry Bay. No fertile *Alaria sori* were observed at low spring tide on April 30th. This marked the end of the fertile *Alaria sori* season until the Autumn. At peak production, we had over 140 litres of cultures in the gametophyte control room.

A major impediment to the development of methodologies capable of adaptation to commercial production of *Porphyra umbilicalis* based on asexual reproduction is the extremely limited availability of mature asexual plants. A concerted effort to locate asexual *P. umbilicalis* plants in the wild, following previous searches in 2019/20, was undertaken in 2021/22. Intensive surveys were undertaken by both Cartron Point Shellfish and



BIM staff in Galway Mayo Sligo and Donegal. Material from these surveys (adult *P. umbilicalis* plants) was collected from sites in each of the counties and returned to the laboratory in Bantry. Microscopic examination of thin sections was undertaken to establish whether plants were Male Female or Neutral. Indeterminate plants (usually as result of immaturity) were retained in temperature and light controlled cabinets until maturity permitted new thin sectioning and gender determination. No new sites of neutral plants of *Porphyra umbilicalis* were found in the Winter and Spring of 2021/22.

Culture for 15,790m of *Alaria* and *Saccharina* string was produced. In 2022 we deployed an early batch of seeded string (September 2022) to combat sub-optimal deployment conditions in late autumn/winter on exposed sites and high frequency of storm events in recent years. Seawater temperatures were about 16°C at the time of deployment which could potentially impact on the seaweed growth pattern. The farmer has reported very positively about the results to date. Plants have reached approximately 10 cms. Such an approach is useful in that November 2022 proved to be a very bad month for deployment. High winds and rolling storms delayed many operations along the coast. Collectors were held at the hatchery for up to 8 weeks. The success of the early deployment in the west indicates that farmers may decide in future to deploy earlier and thus avoid the winter storms. It would be very useful to do further experimental deployments from mid-August to mid-October to investigate how seeded string of both species performs in warmer sea temperatures. Seeded string was supplied to the MI to support their IMTA research programme at Lehenagh Pool.

Traditionally, all seaweed collectors at the BIM seaweed lab are sprayed with fertilized gametophyte cultures. The cultivation of gametophyte cultures is a lengthy and detailed process requiring expensive laboratory equipment. Some hatcheries abroad have used direct seeding as a means of reducing costs and manpower. A number of Irish growers have expressed an interest in this technique seeing it as a more manageable procedure, by avoiding the cultivation and control of gametophyte cultures. In April we did a trial direct seeding on a number of small experimental collectors. Firstly, ripe *Saccharina* blades were collected at Garinish, on the Beara peninsula. These were cleaned according to protocol and partially dehydrated overnight. A controlled sporulation was conducted the following day and the spore density was calculated. Four experimental collectors were sprayed directly with spores using a spray-gun. Growth was observed after 2 weeks, with good plant coverage after exactly 1 month. This was the first time that we successfully sprayed fresh *Saccharina* spores directly on to Kuralon string. Previously we experimented with *Alaria* spores and found that spores did not survive the spray gun method.

We consulted with Irish seaweed producers regarding their skills/mentoring requirements in Spring 2022. The following list outlines their primary requirements:

- Collector seeding using direct or free living (gametophyte culture) techniques
- Accessing markets
- Future position of BIM regarding provision of seeded string
- General algal hatchery requirements, design and methodologies
- Resolving the seasonal demand on limited drying facilities
- Identifying an alternative algal species to be grown in summer months

In terms of seaweed cultivation and hatchery design and methodologies we developed a two-day seaweed mentoring programme which could be provided at the hatchery to interested parties (max. four people) during a low spring tide.

This programme could only be delivered during the period when ripe *Alaria* and *Saccharina* were available in the wild, which is approximately January to April and October to December. The first mentoring session



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scheduled for 1st March to 3rd March was cancelled due to Covid challenges. However, BIM did proceed with internal training at the hatchery site, and this was provided to three individuals who may be involved in seaweed hatchery work at BMRS. Two further mentoring courses took place on 10th October and 25th October. All the attendees were either actively growing seaweed or were interested in setting up a seaweed hatchery. Already, three of the participants have collected ripe material in their own region and conducted sporulations. This reflects positively on the practical nature of the mentoring received.

A technical manual has been produced outlining Hatchery production step by step guide on cultivation techniques, Hatchery blueprint suggested design plus associated costs and Sea-site blueprint suggested design plus associated costs. The report will be launched in Q1 2023. This is seen as a valuable resource for existing seaweed growers wishing to expand their businesses and new entrants.

Summary of Project Spend

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Total Approved Costs	€247,867.00
Total Eligible Expenditure	€247,867.00
EMFAF Eligible Expenditure	€123,933.50
Exchequer	€123,933.50

Report by: Joanne Gaffney

Date: February 2023



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