

# Seaweed Trials & Testing

## Background

Kaly have embarked on a series of trials and tests at their prototype farm at Loch Bay and at several other locations within nearby sea lochs on the NW of Skye. From our studies to date it's clear there are many different factors influencing the outcomes of growing seaweed and its chemical composition. These range from seed selection and growing methods, through to local site environmental characteristics. Kaly have been working with Hortimare in the Netherlands on seed culturing and the James Hutton Institute in Scotland on seaweed analysis and predictive modelling. A study is underway to build a Data Base on local environmental characteristics and from seaweed sampling to begin to understand the key influencing factors which make up the chemical compound composition of brown kelps.

## Site Selection

The selection of each site for current and future trials must undergo a series of site screening exercises by Kaly and its environmental advisers (Ironsides Farrar) to ensure endorsement from the Marine Scotland Directorate.(MSD) Kaly have been granted exemption by MSD and from the Crown Estate Scotland (CES) from any requirement to secure formal approvals or permits to undertake the Research and Development study provided site screening has been undertaken. Site selection will be guided by existing environmental, habitat and climatic conditions, while also ensuring existing marine users are consulted. Notification of trial coordinates to MSD and CES will be given as part of Kaly's agreed protocol.

## Trial Equipment Deployed

A float buoy of 450mm diameter will be anchored to the seabed using a 50kg anchor in the selected trial site at a depth of between 10 metres and 20 metres. The buoy (fig.1) will have a seeded line of *alaria* and one of *saccharina* each 10 meters in length and will be deployed in February'25 using seed cultured from Kaly site at Loch Bay. A Marine Data buoy will be deployed to collect environmental information including temperature, wave conditions and light characteristics, along with nutrient and salinity measurements.

Further trials (fig.2) commencing in late October/early November'25 will be undertaken using sporophytes collected locally and grown on within labs by Hortimare under a protocol developed with Kaly. Analysis from each trial will be used to build a Data Base of the chemical compound composition being produced at different times of the

growing season from each trial location. Comparison with the average compound compositions taken from a variety of samples throughout Europe shown in fig.4 below will be undertaken to determine whether the selected site is likely to be suitable for growing seaweed commercially.

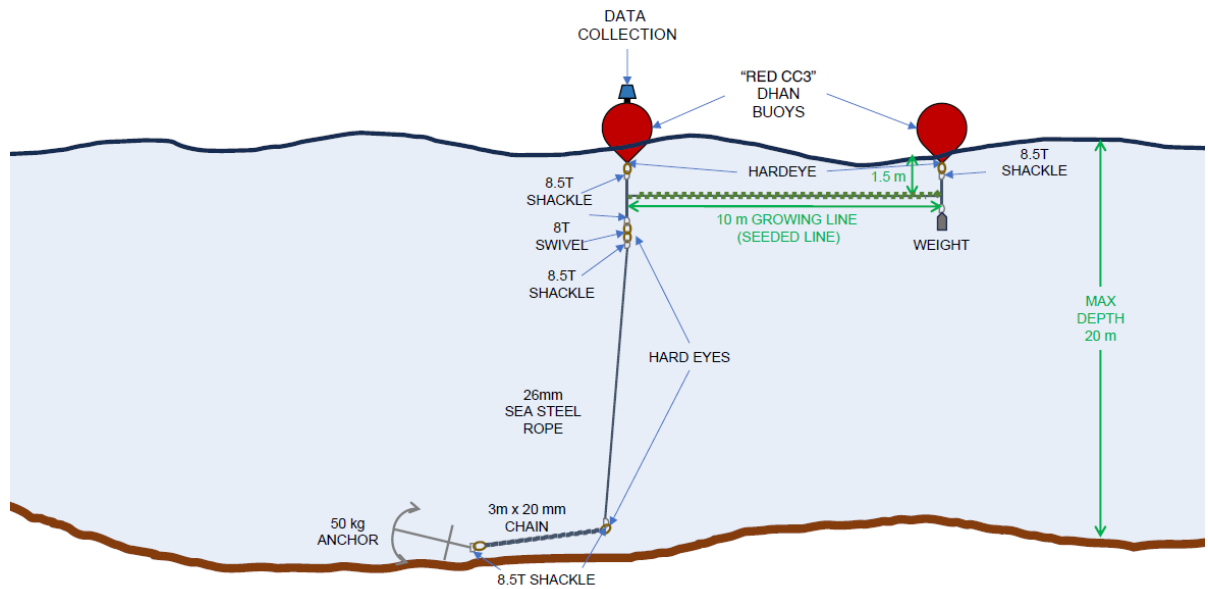


Fig.1 – Equipment used in Trials

Season	Spring '25	Autumn '25	Autumn '26	Autumn '27	Autumn '28
Seeding/Deployment	February	October	October	October	October
Sampling period	April - October	April - October	April - October	April - October	April - October
Trial locations	1	1	1	1	1
Lines per location	2	2	2	2	2
Trial length (months)	7	7	7	7	7
Sampling frequency	Monthly	Monthly	Monthly	Monthly	Monthly
Samples per line	8	8	8	8	8
<b>Total Samples</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>16</b>

Fig.2 – Trials schedule

Season	Spring'25	Autumn'25	Autumn'26	Autumn'27	Autumn'28	TOTAL
<u>Consultancy</u>						
Scientific input PA	500	500	500	500	500	<b>2,500</b>
Spore sample collection	2,000	-	-	-	-	<b>2,000</b>
<u>Sample Analysis</u>						
Sample collection	800	800	800	800	800	<b>4,000</b>
Sample delivery	400	400	400	400	400	<b>2,000</b>
Sample handling & testing	6,800	6,800	6,800	6,800	6,800	<b>34,000</b>
<u>Equipment</u>						
10m Horizontal Line	3,000	-	-	-	-	<b>3,000</b>
Scientific buoy	5,000	-	-	-	-	<b>5,000</b>
Lines repurposing	-	400	400	400	-	<b>1,200</b>
<u>Seeding</u>						
Seeded twine length [m]	20	20	20	20	20	
Seeded twine cost	400	400	400	400	400	<b>3,000</b>
Labour	400	400	400	400	400	<b>5,000</b>
<u>Deployment</u>						
Boat hire	1,000	-	-	-	-	<b>1,000</b>
Labour	400	-	-	-	-	<b>400</b>
<u>Processing</u>						
Drying Machine	1,850	-	-	-	-	<b>1,850</b>
Cutting Machine	450	-	-	-	-	<b>450</b>
Handling labour	1,600	1,600	1,600	1,600	1,600	<b>8,000</b>
Electricity cost	320	320	320	320	320	<b>1,600</b>
Contingency 10%	3,140	1,810	1,810	1,810	1,770	<b>10,340</b>
<b>BUDGET TOTAL</b>	<b>27,340</b>	<b>12,710</b>	<b>12,710</b>	<b>12,710</b>	<b>12,270</b>	<b>81,340</b>

Fig. 3 – Budget forecast

### Costs Estimate

The above cost estimates (fig.3) have been derived from costs already obtained from different suppliers to the Loch Bay trials. Although the above costs over a 4 year period may seem like an unnecessary luxury it is very clear from others entering the seaweed sector that growing seaweed at a site without gathering the appropriate data is a false economy. No land farmer would contemplate planting out a field without knowing the soil could support the crop and the likely yield and returns from cultured seed stock that might be expected. The trials will demonstrate two key factors - firstly that the cap-  
ex of a seaweed farm is more than likely going to justify its investment, and secondly

that the value of the crop grown can be predicted in advance through chemical compound analysis and environmental data collected. While there may be savings to be made in the above cost estimate we believe it prudent for any new entrant to the industry to allow for the above budget.

### Trial Outcomes

From the trial samples in fig.3 above, a comparison can be made with the Compound Composition Chart below in fig.4 to determine the likely commercial value of the different kelps being tested and in particular the most likely timescales for seeding and harvesting to produce maximum returns. Over time, and through Kaly predictive forecasting, it will become possible to establish a selective Breeding Programme for each site location where quality and yield are consistent year on year. Data collection and compound composition analysis are fundamental to the future success of any seaweed farm. Without a clear understanding of which conditions are impacting quality, yield and compound composition, it will not be possible to agree forward commitments/off-takes from downstream processors and in turn end market buyers. Kaly branded cultivated seaweed ensures not just a market but a premium for its partner farmers by being able to demonstrate quality, consistency and provenance.

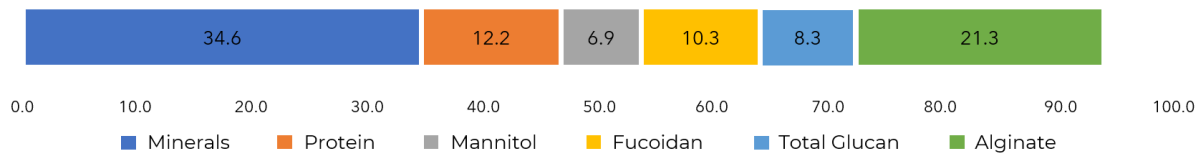


Fig.4 – Average compound composition over 5 years of sampling