



## SEAMARK DELIVERABLE 2.4: IMPROVED AND DEMONSTRATED HARVESTER AND SEEDING MACHINE FOR UPSCALED PRODUCTION IN OPEN OCEAN

Public summary of  
confidential report

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**Summary:**

Large scale seaweed cultivation in Europe requires high capacity and highly efficient seeding and harvesting processes to bring down operational costs. Mechanisation of these – currently largely manual – processes is key to bring the seaweed industry to a higher level. This deliverable covers the technical process of developing and demonstrating a direct seeding prototype, including improved adhesives, as well as a mechanised harvesting prototype, suitable for Ocean Rainforest's cultivation system and partial harvesting method.

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**Work Package / Task:**

*2 / T2.1 Mechanised seeding and  
harvesting technologies at sea*

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Two prototypes of a seeding machine, implementing a 2-step direct seeding technique, were developed and tested at Ocean Rainforest over a period of three cultivation seasons. The second prototype, called the HS-Seaseeder, can seed nearly four times faster than manual seeding while requiring only half the crew. The machine reaches a seeding speed of 3 km/h, thereby fulfilling one of SeaMark's goals.

The adhesion of the seeding material to substrates is also an important contributor to improving the seeding process. Several experiments have brought forward at least two new adhesives that perform better than the currently used glue, improving the efficiency of seeding material usage. Testing these at sea is the next step.

So far, no proven mechanised harvesting method exists that can partially cut the blade (coppice), allowing for regrowth, from cultivated seaweed on vertical grow lines under open-ocean conditions. This is a significant technical bottleneck for scaling up cultivation using the Ocean Rainforest harvest strategy and cultivation unit design. In SeaMark a harvesting machine prototype has been developed, demonstrating that it is possible to mechanise harvesting of vertical grow lines in offshore conditions. However, effectively combining partial cutting and the vertical grow line cultivation system remains a significant challenge for mechanised harvesting at scale.



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