

# FICHE 7

## ADDING VALUE TO SARGASSUM: AGRICULTURE, AGRI-FOOD AND COSMETICS



### Using Sargassum in the agricultural sector

Over time, the techniques for using Sargassum evolve, some of which have proved worthy, particularly in the agricultural sector, and new opportunities are arising. The level of Potassium, Magnesium and Calcium present in the algae is very interesting for soil, not to mention their anti-parasitic virtues. Sargassum does retain several major disadvantages (gas and heavy metals among others), however, numerous analyses reveal that as compost or spreading, Sargassum is a real asset, provided its transformation be meticulously controlled. Current French health standards, particularly concerning compost, require the index of heavy metals not to exceed the threshold of 0.7 mg per kilo. Although the (European) standard is one of the strictest, it should be noted that if 0.7 mg of heavy metals were present per kilo, the quantity would remain too high for the soils which would be degraded.

Firstly, in terms of volumes and costs, the material requires little technical equipment and has the capacity to provide a good supply of organic matter and minerals, especially when used for land application. Composting is more expensive since its processing facilities require more sophisticated techniques. Compost, on the other hand, provides a higher input than land application as the nutrients are more concentrated deriving from its manufacturing techniques.

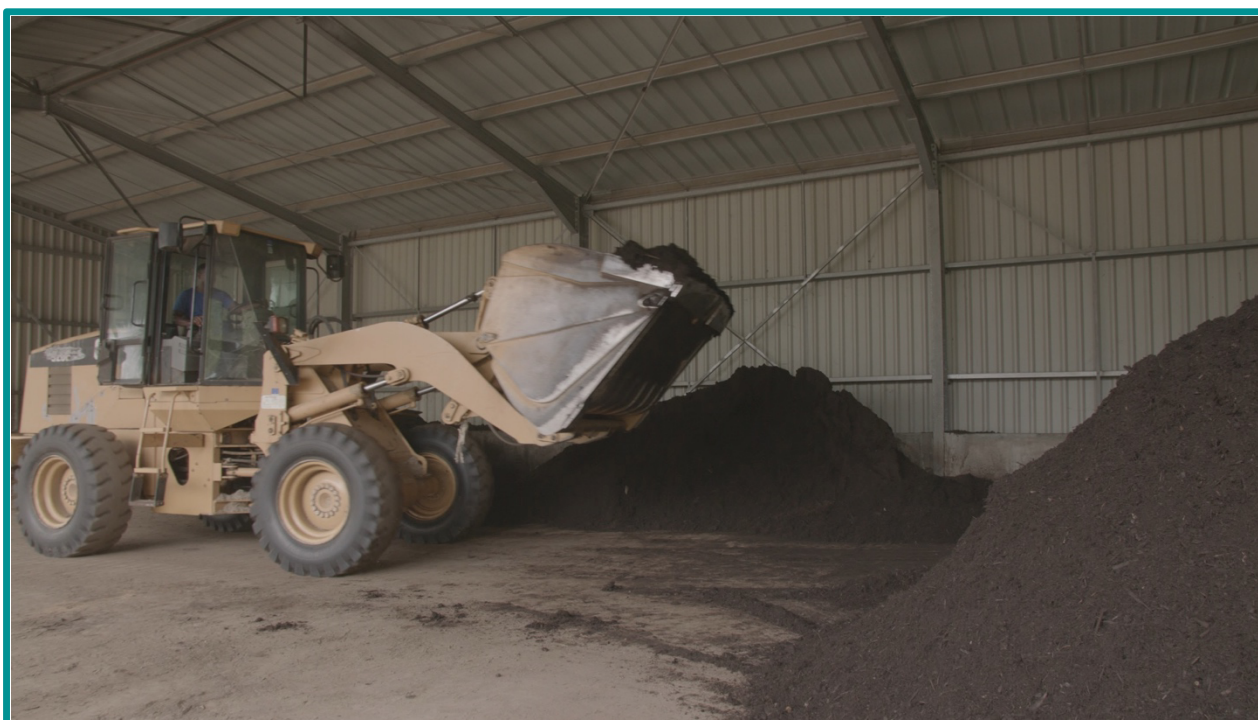


The collection method of the seaweed influences the upstream treatment of its processing- the sand (in varying quantities) and the sea salt can impact the balance and quality of the soil. Also, Sargassum, from its proliferation to its stranding, has a capacity to bio-accumulate heavy metals and chemical agents present in the water (Arsenic, Chlordecone etc.), but studies carried out show that the problem can be mitigated by an appropriate dosage of Sargassum. For spreading for example, it is recommended that a maximum of 5000 tons of seaweed per hectare be used, but the reality is that only 20 to 40 tons are used on average in the French Antilles and other Caribbean countries.



In Martinique, the company Holdex Environnement specializes in industrial composting, and offers to manage the collected Sargassum free of charge (up to 6,000 cubic meters per month)- it is the only company operating thus in the Caribbean. Even though the Sargassum is only present in small quantities, immediately mixed with other green waste after collection (such as sugar cane bagasse), the finished product still meets environmental standards, up to organic farming standards. This is also the case in Guadeloupe, but on a minor scale.

In the Dominican Republic, the company Algéanova manages boom installation, the collection of Sargassum at sea and its transformation into compost. The company transforms around 540 cubic meters per week into compost. The freshly collected seaweed is spread out in rows and dried, then sprayed with a bacterial mixture that allows it to degrade rapidly. It is then mixed with pieces of wood and crushed wood and taken through various treatment steps for 60 days. The finished product is marketed to farmers, including cocoa growers, and there is consensus- Sargassum-based compost helps to air and lighten the soil and improve yields.



In St Lucia, Sargassum is used as a biostimulant, becoming a germination medium that increases crop yields. Algas Organic, the brand name under which Johanan Dujon (the young company's creator and entrepreneur) markets its biostimulants throughout the Caribbean, using a massive quantity of algae to produce its organic fertilizers. Algas Organic is expected to expand into other Caribbean countries soon, North America and Africa.

Other ways of using the seaweed in the agricultural sector, specifically its potential as pig feed, are still being studied, but the first analyses reveal that the presence of heavy metals is too high, which, combined with the necessary extraction of sand, requires a lot of costly treatment. Also, its nutritional value for animals is low.



### **Sargassum and cosmetics**

Exploring other avenues, Sargassum also has beneficial properties for cosmetics. The world's leading producer of sargassum-based skin products OASIS Laboratories is a Barbadian company, founded by two chemists (Kemar Codrington and Mikhail Eversley) who graduated from the University of the Antilles in Barbados.

Since 2018, when the laboratory was founded and the products developed, the cosmetics have been marketed around the world, mainly in the Caribbean. However, as Barbados is a developing island state, the company, which launched its Ocean cosmetic body care range, was self-financed and supported by the Student Entrepreneurial and Empowerment Development. The company has also been able to partner with several eco-hotels.

Most processes start with the extraction of alginates from seaweed, which are fundamental as gelling agents for creams and other body products. This family of molecules, in the form of alginic acids, feeds the different industries that implement various biochemical processes on this raw material.

Sodium alginate extraction is a method in which algal biomass can be used to produce a biopolymer\*, i.e., a compound of several molecules. However, current processing from Sargassum generally gives low yields and slightly lower quality than conventional materials, making it unattractive for commercialization. A Caribbean study estimates an annual yield of 9,000 tons of alginates for 30,000 tons of Sargassum (i.e. 30% of the Sargassum collected), as long as the initial state investment averages 5 million euros at least. Research is ongoing to improve these aspects of Sargassum processing and yield.



Some components of Sargassum also show anti-inflammatory properties. This is interesting because chronic inflammation is the source of many skin problems, and some researchers have suggested that certain types of inflammation are the cause of aging skin.

Large quantities of Sargassum are also sent from the Antilles to France, where several cosmetics manufacturers (such as "Yanne Wellness" in Brittany, Normandy, etc.) use this seaweed for skin care products. In exfoliating powders or in revitalizing masks, Sargassum, the extracts of which can be combined with other green or brown seaweed extracts, is becoming increasingly popular.

In cosmetics, valorising projects are developing simultaneously with research programmes and calls for projects are flourishing. However, these valorisation prospects require a regular yield and therefore regular arrivals, while Sargassum strandings are natural phenomena and therefore, by definition, fairly random.

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\*Biopolymer: Biopolymer materials are made from biogenic (organic and renewable) and biodegradable raw materials. This differs from conventional petroleum-based materials which are not biodegradable.

#### SOURCES

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