



—Scientific Note—

Pilot Study to Evaluate Sargassum Compost for Soil Amendment Potential

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Since 2011, huge influxes of pelagic (living in the open sea) sargassum have been inundating Florida beaches, seagrass meadows, residential canals, and marinas. Sargassum is a genus of brown macroalgae, more generally referred to as seaweed. Sargassum provides numerous ecological benefits in the open ocean and ashore; however, these unprecedented accumulations are negatively affecting nearshore environments and tourism economies. Many coastal counties are developing sargassum management plans as these summer influxes are likely the “new normal.” In Monroe County alone, the Tourist Development Council estimates the economic impact from a severe sargassum year could be \$20 million and 300 lost jobs (Unpublished report. Rockland Analytics. 2020. Executive Summary, Assessment of Sargassum Activity in the Florida Keys and its Impact of Monroe County’s Economy).

As a result, there is a need to find economical methods for sargassum removal and reuse. However, there is a concern of heavy metal accumulation, specifically arsenic, that could limit the reuse of this macroalgae (Rodríguez-Martínez et. al. 2020). Composting could offer a viable option as part of a management toolbox for governments and stakeholders. The brown macroalgae is high in nitrogen content and other macro- and micronutrients. The material breaks down rapidly and Sembera et. al. (2018) found soluble salt content to be within the acceptable range for composts typically sold in the horticulture industry.

Materials and Methods

The goal of this pilot study is to determine the viability of sargassum compost as a soil amendment as tested through a range of typical metrics measured for commercially available compost. This study is also being replicated in Sarasota and Martin Counties. For each location, twelve Geobin Composting

Systems were filled with four different compost recipes consisting of sargassum and woodchips (Table 1). The wood chips are specific to each county. For Monroe County, FL woodchips are a mixture of tropical hardwood species typically found in utility trimmings. Every 30 d the compost piles are turned by hand with shovels and samples are collected for analysis following standard operating procedures. Samples are analyzed for water content, pH, electroconductivity, and temperature. Every 60 d samples are also analyzed for total nitrogen, total phosphorus, and potassium. Arsenic (As) levels will also be measured every 60 d.

Discussion

This pilot study will run for four months and is still underway. Our goal is to assess the quality of sargassum compost and identify the As levels. This information may help alleviate concerns people may have and help to manage the economic impact associated with sargassum. If As levels are low, composting sargassum may be part of a larger management toolbox for dealing with heavy sargassum loads on beaches and shorelines. By utilizing sargassum in a composting system, taxpayer dollars could be saved by diverting this material from landfills and create a value-added product for community reuse. The City of Fort Lauderdale has a similar large-scale, sargassum composting program that it implemented in 2010, though no analysis of the finished compost has ever been conducted.

Literature Cited

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Table 1. Sargassum/wood chip treatments in a composting pilot study conducted in 2021 in Key West, FL.

Treatment I	Treatment II	Treatment III	Baseline control
100% sargassum by volume	50% sargassum/50% wood chips by volume	25% sargassum/ 75% wood chips by volume	100% wood chips by volume