

DREDGED SEDIMENT MIXED WITH ORGANIC WASTES TO GROW VEGETABLES

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Abstract

The use of phosphorus (P) rich dredged sediments in horticultural growth media is an attractive recycling option in compliance with a circular economy and contributes to closing the P cycle in food production. The present study aims to evaluate the potential of dredged Baltic Sea sediment as growth substrate. The sediment is characterized by P and nitrogen enrichment and a moderate to low level of contamination with heavy metals such as Cd, Pb, and As (Ferrans et al., 2019). Cultivation experiments have been set up to address the following research questions, among others.

- Is sediment-based growth substrate suitable for cultivating plants?
- Which P species are present in the sediment and which fraction of total sediment P is plant available?
- Can the mobility of toxic heavy metals in the sediment be reduced by biochar amendment?

The cultivation experiments are carried out both under controlled conditions in the greenhouse and in an outdoor trial using a variety of plants. Different growth substrate mixtures are tested that consist of sediment, peat, bark mulch and biochar at varying proportions. Analyses include sediment P and metal speciation and a thorough characterization of chemical and physical properties in the sediment and substrate mixtures. Drainage water and plant analyses will be used to assess plant growth, P and metal mobility, and strategies to reduce plant availability of toxic metals.

REFERENCES

Ferrans, L., Jani, Y., Gao, L., Hogland, W., 2019. Characterization of dredged sediments: a first guide to define potentially valuable compounds – the case of Malmfjärden Bay, Sweden. *Advances in Geosciences*.49.137–147.