On site conversion of olive tree prunings to biochar and environmental benefits

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Biomass conversion to biochar is a relatively new and promising strategy for global climate change mitigation, circular economy and sustainable development. Biochar application to soils stores carbon for extended periods of time and improves soil properties. It acts as a soil conditioner, which facilitates storage and delivery of nutrients and water to plants, also offering an ideal infrastructure for soil microorganisms to thrive.

Olive tree prunings are a major source of agricultural biomass wastes, in Greece and in other Mediterranean countries, and are mainly disposed of by burdening burning in the field. Pyrogenic Carbon Capture and Storage can be alternatively applied, using olive prunings as a feedstock. Open flame pyrolysis kilns offer a relatively fast and easy, inexpensive and effective way for the carbonization of olive prunings and other biomass residues, with high carbon capture efficiency and rather low emissions. High quality biochar can be produced. Kilns are portable and the procedure can be applied almost anywhere, where biomass exists, without expert's supervision. It appears to be a worthwhile biomass waste management alternative for further study, development, and applications.

The aim of this study is to present the possibilities of open flame pyrolysis kilns in order to manage olive tree prunings and produce valuable added materials, such as biochar. In addition, this work conducts an initial assessment of possible environmental impacts that are emerged from this procedure and others that are mitigated-mainly CO_2 as the primary greenhouse gas emitted through human activities.