Pelletization of composted biochar with residues of the olive-oil extraction process

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**Keywords:** organic fertilizer; compost; agricultural wastes;

**Abstract.**

Application of fertilizers in the cropland plays an important role for favouring agricultural production. However, the main agro-environmental impacts related with intensive fertilizer application have been associated with leaching and run off of nitrogen and phosphorous that cause eutrophication. In the last decade, the use of lignocellulosic biomass for energy purpose produce yearly amount of organic residues as biochar. In fact, many researchers proved that biochar can reduce the fertilizer loss to improve soil fertility. Biochar is a porous and carbonaceous material generated through biomass conversion technology under a depleted oxygen atmosphere and contains nearly non-degradable organic carbon with double bonds and aromatic ring. One of the principal problem is the dust production during handling and storage of biochar and for this situation the pelletization can significantly favours field application. At the same time, the production of olive oil represents an industrial activity with several problems due to the management of process residues. A typical solution is the composting phase for agronomic uses or for horticulture. Compost generally has a low density and can take up a great deal of storage volume, so its densification would help to reduce the required storage capacity. In addition, a danger represented by handling compost is the dispersion of dust, which can potentially carry pathogens and toxic organic substances. For this reason, the regional project - RI.MA.CO -, funded by PSR Calabria 2014- 2021 (Calabria’s Rural Development Programme) under Project Action 16.2: “*Support for pilot projects and the development of new products, practices, processes and technologies in the agri-food and forestry sector*”, has been aimed to solve several problems in the management of biochar and olive oil residues. In particular, the composting process has been improved with the addition of biochar as a co-compost material. The tests were *i*) to produce compost pellets using biochar in different formulations and *ii*) to observe the quality of different biochar pellets mixed with organic compost with respect to several factors that affect handling, storage, and distribution. The result of this study could be introduced to the actual knowledge to expand and improve techniques of management of residues of the olive-oil extraction process and biochar.