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Aerobic and anaerobic digestion of agricultural wastes as sustainable recycling technologies: Benefit & comparison of the end products for fertilizer purpose

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Agricultural waste removal has become an ecological problem, brought to light as a result of an increase in public health concerns and environmental awareness. Aerobic and anaerobic treatments of agricultural wastes appear to be the most promising approaches for reducing agricultural wastes going to landfills while producing environmental and socio-economic benefit. In view of the above considerations, the objective of this study was to analyze the chemical characteristics of two composts and two digestates and to compare their effects on soil chemical, and biochemical properties and on crop productivity and quality to determine their suitability as fertilizer. Results evidenced that waste characteristics influenced the chemical properties of the compost much more than composting process. The obtained composts had a positive effects on soil, increasing organic matter (SOM), nutrients, microbial biomass (MBC), bacterial and fungal population. The best result on soil, was obtained by using the compost produced with a mix of broadleaf vegetables. Regarding crop productivity, the data showed a specificity between crop and type of compost used. Digestates positively affected soil chemical and biochemical parameters depending on the type of fraction and on the concentration used. The digestates were less effective than compost in inducing crop productivity and quality. In conclusion, the agronomic quality of compost and digestate is strictly dependent on percentage and type of feed stocks used in the aerobic or anaerobic process. The results confirm that compost and digestate offer important soil improvements that are mutually beneficial rather than alternative, even if the compost is better than digestate in inducing crop productivity and quality.

Speaker Biography

Muscolo Adele graduated in Biological Sciences (MSc), has completed her PhD in Food Science at the age of 26 years at the Policlinic Federico II University of Naples, Italy. In 1988 she started is professional carrier as researcher at Mediterranea University of Reggio Calabria where she is still working as Full Professor in soil chemistry and ecology. Since 1990 she is reviewer for International Scientific Journals and since 2008 she is evaluator of projects for European Community, International Funding Research Agencies and Italian and Foreign Research Ministries. She is examiner of international PhD dissertation. She has over 180 papers in international journals with IF. Citations: 1597 H index: 21. She has been serving as an editorial board member of many International Journals. She is Associate Editor for JFR.

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