

## New material to enhance soils using manure waste

## May 6 2015

Researchers at Universidad Politécnica de Madrid have obtained biochar using manure waste, a new material that can improve soil properties and increase crop yields.

The results of a research group from the Universidad Politécnica de Madrid suggest an optimal solution to manage the manure from chicken and cattle. Biochar, a material obtained after thermal treatment of waste through pyrolysis, is an organic fertilizer that not only has positive effects on crop yields, but also represents a significant reduction of  $CO_2$ emissions compared to the direct application of manure waste on soils.

Waste production, either from urban, industrial or agricultural sources, is a major environmental problem. In fact, recycling, reusing and using raw materials from the waste we generate are some of the technical challenges that we face today. The European Union is indeed investing in efforts to promote the efficient use of resources.

The waste contains fertilizers, and its production has increased in recent years because of intensive farming and has been traditionally used in soils as an organic additive. However, its high-volume production and the generation of <u>environmental problems</u> (eutrophication and pollution of groundwater due to its high concentration of nutrients, production of methane emissions and odors) make it necessary to search for other <u>waste management</u> routes.

The research carried out by the Departments of Geological and Mining



Engineering and Agricultural Production of UPM shows that the biochar produced from manure of cattle, pigs and chicken is an organic fertilizer with a high content of nutrients, stabilized organic material and high values of cation exchange capacity. These results give evidence of the positive effects of using biochar as a fertilizer on soils for better <u>crop yields</u>.

Additionally, the results show that the pyrolysis of manure waste has other environmental benefits such as reduced soil nutrient leaching and less waste volume, removal of odor and pathogens of the original material. Pyrolysis of manure waste can drastically reduce  $CO_2$ emissions compared to the direct application of manure waste to soils.

These findings are the results of a close collaboration among the research group of Valuation of resources from UPM, Guía Ávila Ingenieros Co. and the Abulense Confederation of Employers, that are interested in searching for new activities that relaunch the economy of marginal agricultural areas like the Valle Amblés (Ávila). These results are of great interest and have immediate practical application in associations of farmers and agrifood companies.

**More information:** "Agronomic properties of biochars from different manure wastes," *Journal of Analytical and Applied Pyrolysis*, Volume 111, January 2015, Pages 173-182, ISSN 0165-2370, dx.doi.org/10.1016/j.jaap.2014.11.014

## Provided by Universidad Politécnica de Madrid

Citation: New material to enhance soils using manure waste (2015, May 6) retrieved 2 May 2024 from <u>https://phys.org/news/2015-05-material-soils-manure.html</u>



This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.