SPECIAL SECTION

BIOCHAR

https://doi.org/10.1017/S1755691013000157 Published online by Cambridge University Press

https://doi.org/10.1017/S1755691013000157 Published online by Cambridge University Press

Introduction to Special Section on Biochar

Paul Bishop

The five papers in this Special Section are a selection of those presented at the 3rd Annual Biochar Conference, held in Edinburgh in May 2011 by the UK Biochar Research Centre – an alliance of research groups from the University of Edinburgh's School of Geosciences, Newcastle University and Rothamsted Research.

Biochar is charcoal, formed by the heating (pyrolysis) of organic matter (biomass) to at least 250°C in an oxygen-free environment. This heating produces gases and liquids that are a rich source of energy, and also char (charcoal), the latter being well known in many traditional and modern societies that produce charcoal for domestic and industrial applications. When the char has been produced so as to have beneficial environmental effects, it is called biochar and can be used in several ways for those benefits.

First, biochar can have major beneficial effects on soil properties and on the holding and release of water and nutrients. Ventura *et al.* here assess the effects of biochar on soil properties and, in a similar vein, Devereux and co-workers assess biochar's impacts on soil physical properties and winter wheat growth. Likewise, Tammeorg *et al.* examine the ways in which biochar that has been produced from softwood affects the nitrogen mineralisation dynamics of meat bone meal and cattle manure in soils. Novel applications of biochar produced from bagasse – the fibrous 'waste' plant material from sugar cane processing, constituting about 30% of the mass of cane crushed – are explored by Kondo *et al.*; and Md Som and colleagues investigate the characteristics of biochar produced from palm fronds. The wide range of applications of biochar is highlighted by these papers, as is the range of possible source materials and the many environmental and economic settings in which biochar can be produced.

A second major application of biochar, along with its role in improving soil properties and chemistry, is as a long-lived store of the carbon that is locked up in the char. The carbon in biochar produced by pyrolysis is highly stable and hence is sequestered by being converted to biochar. That carbon is in effect removed from being cycled back into the atmosphere, thereby helping to offset the 'old' carbon that is being released into the atmosphere by the burning of fossil fuels.

This journal, *Earth and Environmental Science Transactions of the Royal Society of Edinburgh*, is pleased to publish this set of papers that aptly addresses the second element in our journal title; namely, the environment.

We thank Dr Saran Sohi and Dr Ondřej Mašek, from the UK Biochar Research Centre, University of Edinburgh, for their help in publishing these papers, the Referees who are an essential part of publishing scientific papers and, of course, the Authors for providing the papers and responding in a timely manner to the editing process.

© 2012 The Royal Society of Edinburgh. doi:10.1017/S1755691013000157
https://doi.org/10.1017/S1755691013000157 Published online by Cambridge University Press