



European
Centre for Advanced
Studies

Lower Saxony – Scotland Joint Forum 2021

23 November 2021

Session II – 10 am CET

BioCharCrust – Application of Biocrust Inoculum and Biochar for Soil Bioremediation

1. Workshop Organizer

Dr. Claudia Colesie, *University of Edinburgh*

Dr. Vincent Felde, *Leibniz University Hanover*

2. Workshop Description

Previously industrially developed land that is no longer in use and that may be potentially contaminated represents an increasing problem. In Europe and North America alone, 3.5 million of such 'brownfield' sites remain ignored. This is problematic not only because these sites are supposedly contaminated by hazardous waste but also because their abandonment means a significant loss of potentially productive land that may otherwise be used for sustainable agriculture, as a carbon sink or to host diverse wildlife. Brownfield land rehabilitation requires physical and biological regeneration of the local soils. This workshop aims to bring together scientists in the field of physical soil amendments, namely, Biochar, and biological soil restoration in the context of induced biological soil crusts. Biological soil crusts are conglomerates of early successional organisms such as green algae, cyanobacteria, mosses, lichens, fungi and other soil microbiota. These communities play an important role in revitalising barren soil surfaces by enhancing water retention, stabilising loose soil particles and creating a fertile substrate for higher plants to thrive upon due to their photosynthetic and Nitrogen-fixing activity. Biochar, on the other hand, is a charcoal-like substance that is made by burning organic material from agricultural and forestry wastes. When incorporated into the soil, Biochar can improve the soil's physical properties by enhancing soil structure, increasing water retention and aggregation, decreasing acidity and reducing soil salinity.

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Because Biochar is made from organic material, Biochar application is a carbon-negative process, which means that atmospheric CO₂ is stored in the soil. This workshop aims to discuss the potential of different soil amendments for the improvement of soil health/fertility and if they can be combined and as a tool for ecosystem restoration. Bringing together physical and biological aspects of soil remediation has the potential to improve appliances and therefore ameliorate soil rehabilitation in the future.

3. Programme

(The times of the programme items are indicated in CET.)

10:00 am Welcoming Address

Dr. Claudia Colesie, *University of Edinburgh*

Dr. Vincent Felde, *Leibniz University Hanover*

10:05 am Biochar at the plant-soil interface

Dr. Saran Sohi, *University of Edinburgh*

10:20 am Biochar production and modification – tuning properties to applications

Dr. Ondrej Masek, *University of Edinburgh*

10:35 am Challenges in mine restoration

Dr. Helena Serrano, *University of Lisbon*

10:50 am Coffee Break

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- 10:55 am** **Development and application of microbial inoculum for biological soil crust restoration in drylands**
Dr. Ana Giraldo-Silva, *Rice University*
- 11:05 am** **Restoring post-mining ecosystems with native microbes used as biofertilizers**
Dr. Miriam Munoz-Rojas, *University of New South Wales*
- 11:20 am** **Development of Biocrusts: Implications for Ecological Management and Restoration**
Dr. Shubin Lan, *Chinese Academy of Science*
- 11:35 am** **Panel Discussion/ Round table**
- 11:55 am** **Closing**

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