



UNIVERSITÀ
DEGLI STUDI DI BARI
ALDO MORO



MINISTERO DELLE POLITICHE AGRICOLE
ALIMENTARI E FORESTALI



EUROSOIL 2012

SOIL SCIENCE FOR THE BENEFIT OF MANKIND AND ENVIRONMENT

4th International Congress of the EUROPEAN CONFEDERATION OF SOIL SCIENCE SOCIETIES (ECSSS)

2-6 July 2012, Bari – Italy

EUROSOIL 2012 and ECSSS President
Prof. Nicola Senesi

FINAL PROGRAMME



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TUESDAY 3 JULY 2012 - FIRST FLOOR - Pavilion 10

POSTER SESSIONS

17.00-18.30	S06.03-P -11 MONITORING DROUGHT EFFECTS ON SOIL STRUCTURE AND HYDROLOGICAL SOIL FUNCTIONS <i>Katharina Gimbel, Freiburg - Germany</i>
	S06.03-P -12 NITROGEN AND MICROBIAL DYNAMICS IN TWO PORTUGUESE FLOODED RICE SOILS <i>Corina Carranca, Oeiras - Portugal</i>
	S06.03-P -13 PREDICTION OF THE EFFECTS OF CLIMATE CHANGE ON THE SOIL SALINITY OF AN IRRIGATED AREA UNDER MEDITERRANEAN CONDITIONS <i>Jose Miguel De Paz, Valencia - Spain</i>
	S06.03-P -14 ROADSIDES IN URBAN AREAS OR IN THE OPEN LANDSCAPE ARE SECONDARY HABITATS <i>Bozena Sera, Ceske Budejovice - Czech Republic</i>
	S06.03-P -15 SOIL CARBON STOCKS IN THE FOREST SECTOR OF JAPAN AND THEIR DETERMINING FACTORS <i>Ugawa Shin, Tsukuba - Japan</i>
	S06.03-P -16 SOIL INORGANIC CARBON STOCK OF ITALY <i>Roberto Barbetti, Firenze - Italy</i>
	S06.03-P -17 TEMPERATURE EFFECTS ON VARIOUS FOREST LITTER DURING THEIR DECOMPOSITION ALONG MOUNTAIN ELEVATION GRADIENT <i>Beata Klimek, Krakow - Poland</i>
	S06.03-P -18 CHANGES IN EXTRACTABLE ZN, CU, K AND NA AS AFFECTED BY SILICON, SALINITY AND WATERLOGGING IN A SANDY LOAM SOIL <i>Jahanshah Saleh, Tabriz - Iran, Islamic Republic of</i>
	S07.02-P INNOVATION AND SOIL SCIENCE - APPLICATION OF ADVANCED NMR AND MRI TECHNIQUES FOR IMPROVING OUR UNDERSTANDING OF SOIL ORGANIC MATTER FORMATION AND ITS INTERACTION WITH THE MINERAL PHASE
	S07.02-P -1 APPLICATION OF FAST FIELD CYCLING NMR RELAXOMETRY FOR THE EVALUATION OF THE EFFECTS OF ORGANIC AMENDMENTS ON STRESSED SOILS <i>Maria A. Rao, Portici - Italy</i>
	S07.02-P -2 APPLICATION OF FAST FIELD CYCLING NMR RELAXOMETRY TO DIFFERENTIATE AMONG AFFORESTED SOILS <i>Pellegrino Conte, Palermo - Italy</i>
	S07.02-P -3 ASSESSING THE INFLUENCE OF BIOCHAR ON SOIL STRUCTURE AND SOIL WATER RETENTION: A 1H NMR RELAXOMETRY STUDY COUPLED WITH HIGH-ENERGY MOISTURE CHARACTERISTIC TECHNIQUE ON A LABORATORY SCALE <i>Claudio De Pasquale, Palermo - Italy</i>
	S07.02-P -4 COMBINING SOLID-STATE 13C NMR SPECTROSCOPY WITH CHEMICAL ANALYSIS TO STUDY SOM STABILIZATION MECHANISMS IN BRAZILIAN SOILS <i>Marta Velasco-Molina, Santiago de Compostela - Spain</i>
	S07.02-P -5 EFFECT OF HF DEMINERALIZATION PRE-TREATMENT ON THE QUALITATIVE AND QUANTITATIVE ASSESSMENT OF SOM IN ANDOSOLS. PY-GC/MS AND SOLID STATE NMR SPECTROSCOPY <i>José A. González-Pérez, Seville - Spain</i>
	S07.02-P -6 EFFECTS OF MANURE AND MINERAL FERTILIZATION ON SURFACE AREA (SA) OF DIFFERENT WATER STABLE AGGREGATES <i>Gianluca Simonetti, Legnaro (PD) - Italy</i>
	S07.02-P -7 ESTIMATED AND DIAGNOSTIC CRITERIA OF QUALITATIVE COMPOSITION OF SOIL ORGANIC MATTER <i>Alexander Popov, St. Petersburg - Russian Federation</i>
	S07.02-P -8 EXPLOITING 13C MAGNETIZATION VIA MULTIPLE CONTACTS: AN EFFICIENT CROSS POLARIZATION SCHEME FOR SOIL ORGANIC MATTER STUDIES <i>Denis Courtier-Murias, Toronto - Canada</i>
	S07.02-P -9 IMPROVING STRUCTURAL CHARACTERIZATION OF SOIL ORGANIC MATTER BY 2-DIMENSIONAL HETERONUCLEUS CORRELATION SOLID-STATE 13C NMR (HETCOR) SPECTROSCOPY <i>Heike Knicker, Sevilla - Spain</i>
	S07.02-P -10 LONG-TERM EFFECTS OF MANURE AND MINERAL FERTILIZATION ON SAND SOIL ORGANIC MATTER <i>Gianluca Simonetti, Legnaro (PD) - Italy</i>
	S07.02-P -11 NON-INVASIVE LOCALIZATION OF SOIL ORGANIC MATTER IN SOIL AGGREGATES USING SYNCHROTRON-BASED X-RAY MICROTOMOGRAPHY <i>Stephen Peth, Kiel - Germany</i>
	S07.02-P -12 NOVEL APPROACHES FOR IDENTIFYING PHOSPHORUS SPECIES IN TERRESTRIAL AND AQUATIC ECOSYSTEMS BY 31P NMR <i>Johan Vestergren, Umeå - Sweden</i>
	S07.02-P -13 ORGANO-MINERAL INTERACTIONS IN THE ALLOPHANIC ANDOSOL AND ARENOSOL: THE IMPACT OF MICRO-MORPHOLOGY AND SURFACE CHEMISTRY AS REVEALED BY 129XE- AND 13C NMR SPECTROSCOPES <i>Filimonova Svetlana, Freising, - Germany</i>
	S07.02-P -14 SOLID STATE 13C NMR AS A WAY TO EVALUATE ORGANIC MATTER IN AGRICULTURAL SOILS <i>Marco Panettieri, Seville - Spain</i>
	S07.02-P -15 SOLID-STATE 13C AND 15N NMR SPECTROSCOPIC ANALYSIS OF ORGANIC MATTER IN A MEDITERRANEAN SOIL AFTER AMENDMENT OF N-AMMOXIDIZED LIGNINS <i>Heike Knicker, Seville - Spain</i>

Assessing the influence of biochar on soil structure and soil water retention: a ^1H NMR relaxometry study coupled with high-energy moisture characteristic technique on a laboratory scale

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Production of biochar and its storage in soils have been suggested as an efficient way to mitigate global climate changes through carbon sequestration in soils. In addition, application of biochar to soils concomitantly results in increase of soil structure, improvement of crop yield and enhancement of drought tolerance by plants. Application of biochars to soils also promotes reduction of irrigation needs in arid and semiarid regions which are affected by droughts and considerable climate variability. In order to understand the molecular mechanisms involved in the positive effects of biochars applied to soils, soil structural stability and soil water retention capacity were investigated by high-energy moisture characteristic technique (HEMC) after amendment of a Sicilian soil with different amounts of an industrially produced biochar. HEMC was applied under laboratory conditions on re-packed soil samples mixed with the different biochar amounts. Matrix potential values were varied in the range 0-150 cm. The soil/biochar samples were also investigated by fast field cycling (FFC) NMR relaxometry for the understanding of water molecular dynamics. Both HEMC and FFC NMR relaxometry results revealed that water mobility increased with increasing biochar amounts in soils. These results confirmed that soil amendment with biochar may enhance water availability, and hence soil solution, for plant nutrition. Finally, to the best of our knowledge the present study combined for the first time results from HEMC and FFC NMR relaxometry, thereby showing the suitability of both techniques for the evaluation of soil structural stability.

