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increased four times and an increment of 13% in chlorophyll content was observed in BANP treatment with respect to controls at any time studied. At 20 days, nodules were present only in BANP treatment. At day 30, leghemoglobin content in the nodules of BANP plants doubled that of the controls. We concluded that incubation of bacteria in the presence of magnetite NPs resulted in improvement of nodulation and biological nitrogen fixation, which was accompanied by greater seedling growth and chlorophyll level. Thus, magnetite NPs could become a good candidate for the design of new products for agricultural use.

A85

EFFECTS OF TWO BIOCHAR TYPES ON ENZYMATIC ACTIVITY IN THREE AGRICULTURAL SOILS WITH DIFFERENT DEGREES OF DEGRADATION

Dominchin ME, Verdenelli RA, Berger MG, Aoki A, Meriles JM.

Instituto Multidisciplinario de Biología Vegetal (IMBIV- CONICET) Córdoba, Argentina. Instituto de Ciencia y Tecnología de los Alimentos (ICTA) Facultad de Ciencias Exactas, Físicas y Naturales (FCEFYN) Universidad Nacional de Córdoba, Argentina.

E-mail: flor.dominchin@gmail.com

Land degradation or soil quality deterioration is an environmental problem with a significant influence on production. Several factors may be cited as causes of land degradation; however, changes in land use and crop managements are currently one of the main drivers of soil disturbance. Particularly, in Argentina agriculture intensification and application of inadequate crop management practices have affected soil quality and productive potential of soils. Biochar, a carbon-rich material produced by thermal decomposition of biomass under oxygen-limited conditions, can increase soil productivity by improving both chemical and physical soil properties. In the present study two types of biochar were used. Thus, the conducted research aimed at assessing the effect of poultry litter and peanut shell biochar on the enzymatic activity in agricultural soils with different degrees of degradation. Typical Haplustoll soils were sampled in Córdoba Province (31°19' S; 64°13' W), Argentina. Three test sites were selected: 1) native forest as a control (L1), 2) lot with 2: 1 rotation (soybean-corn) and no-till (L2) and 3) lot with soy monoculture under conventional tillage (L3). The edaphic deterioration gradient was categorized according to the OM content. Soils were treated with three doses of biochar (0%, 1% and 3%) and incubated for 120 days. Enzymatic activity of the microbial communities was evaluated by hydrolysis of fluorescein diacetate (FDA), dehydrogenase activity (DHA) and β -glucosidase activity (estimated by multiple substrates –MUF-). For L2 and L3 soils, amendment with 3% of quail excreta biochar or 1% of peanut peels biochar significantly increased FDA activity. DHA was higher in L2 soil with 0% and 1% of quail excreta biochar. However, the application of peanut shells biochar did not affect DHA. Finally, β -glucosidase activity increased significantly in L1 soil compared with L2 and L3 soils. At dose of 1% and 3%, both quail excreta and peanut shell biochar, increased β -glucosidase activity. Biochar application modifies enzymatic activity in soils with different degrees of deterioration, principally in those with less OM content. A greater influence of biochar application in total microbial activity (FDA) and β -glucosidase was observed. No major differences were observed between different biochar types.

A86

Bothrops alternatus VENOM PRETREATED WITH CHELATING AGENT FOR ANTISERUM PRODUCTION

López G, Van de Velde A, Leiva L, Fusco LS.

Laboratorio de Investigación en Proteínas (LabInPro), Facultad de Ciencias Exactas y Naturales y Agrimensura, Universidad Nacional del Nordeste (UNNE).E-mail: giselopezaccuzzi@gmail.com

Snakebite envenoming is a major public health problem in tropical countries. The only specific therapies currently available for the treatment are antivenoms, which consist of polyclonal immunoglobulins purified from sera/plasma of horses or sheep immunized with doses sublethal of snake venom(s). *Bothrops alternatus* (BaV) venom induces a prominent tissue local damage, especially, hemorrhage, muscle damage and inflammation. These complex pathological phenomena are due to the concomitant action of metalloproteinases (SVMPs) in venoms and others edema-inducing components. In order to obtain a high titer of antibodies and reduced local damage in the animal, an alternative immunization protocol was proposed where the SVMPs action was blocked by using a chelating agent. For this proposal, the *B. alternatus* venom (10 mg/mL) was blocked by EDTA-Na₂ (10 mM, BaV/ EDTA-Na₂) and used as antigen. Previously to the inoculation, the excess of chelating was removed by passing the mixture on Sephadex G-25 column (venom without inhibitor was subjected to the same process) and the effective neutralization of SVMPs using azocasein as substrate was determined. Group of 5 Balb/c mice were immunized subcutaneously on days 0, 15 and 30 with BaV (15-30-45 μ g) or BaV/ EDTA-Na₂ (45-90-135 μ g) emulsified with Freund's Adjuvant (complete first and incomplete-booster). Blood samples were collected by the animals tail tip on days 14, 29 and 41 of protocol immunization and it was destined to ELISA's test. The results showed that the immunized animal with BaV/ EDTA-Na₂ had a higher titer (5.1x10⁴) than those treated to BaV (1.3x10⁴). Macroscopic analysis at the inoculation site of mice injected with Freund's adjuvant showed local damage (with non-infectious abscesses) and hypertrophy of inguinal lymph nodes. Our results show that BaV/ EDTA-Na₂ formulation, where the SVMPs are blocked, produced a higher humoral response compared with the produced by BaV. These preliminary results demonstrated the potential use of blocking the toxins with chelate to produce antivenom with less damage in the animals.