

Soil samples were collected in the 0-10 cm, 10-20 cm and 20-30 cm layers in four different eucalyptus plantation areas under different ages, being an area under native vegetation of stricto sensu Cerrado (ACN), two-year-old eucalyptus (EU2), five-year-old eucalyptus (EU5) and eight-year-old eucalyptus (EU8). The total organic carbon content and, consequently, the carbon stocks were calculated, whose correction of the mass was made by the equivalent mass of the soil. The rate of carbon accumulation was made relative to the area under native vegetation. Among the total organic carbon contents there was a significant difference in the area of EU2 in the depth of 10-20 cm when compared to the other areas. However, when comparing the depths, the largest carbon stocks were as follows: 0-10 cm > 10-20 cm > 20-30 cm, regardless of the age of the eucalyptus. In relation to the carbon accumulation, all areas presented lower values when compared to the soil under Cerrado, except for AEU8 that presented increase of up to 2 Mg.ha<sup>-1</sup>. Eucalyptus cultivation for 8 years in the Cerrado has increased carbon stocks in depth, favoring a greater accumulation of carbon over the years.

**Keywords:** soil organic matter, vegetal residue, soil use

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#### (8445 - 2529) The Changes of Soil Carbon Content According to Organic Material Types in Upland Soil

Hyeoun-Suk Cho<sup>1</sup>, Myung-Chul Seo<sup>1</sup>; Tea-Seon Park<sup>1</sup>; Jun-Hwan Kim<sup>1</sup>; Wan-gyu Sang<sup>1</sup>; Pyeong Shin<sup>1</sup>; Geon-Hwi Lee<sup>1</sup>

National Institute of Crop Science<sup>1</sup>

Organic matter is a substance that contains carbon. When applied to soil, it can improve the physical and chemical properties of soil and supply nutrients to plants. Also, it is decomposed in soil due to microbe activity, and utilized by crops. The remaining differential to materials is accumulated in the soil and increases organic matter content in soil. Therefore, we analyzed the types of carbon content according to time while cultivating beans in soil with 4 different kinds of organic matter applied. Total carbon content was higher in organic matter application than in control (non-organic matter). Among the other organic matters, it was especially high in livestock manure(LM) application with 11.38 g kg<sup>-1</sup>, Hairy vetch(HV, 8.88gkg<sup>-1</sup>), Oil cake(OC, 8.92gkg<sup>-1</sup>), and Rice straw(RS, 8.24gkg<sup>-1</sup>) did similar. According to soil carbon form, Humin carbon(HnC) had the highest total carbon content of 62.6 ~ 64.4 %, Humic acid carbon(HC) had 35.6 ~ 37.7 %, and Fulvic acid carbon(FC) had 17.0 ~ 19.3 %. This pattern was the same in both control and organic matter application. Every type of carbon was the highest in LM application. Therefore, it was concluded that LM, which had a high level of humin carbon that is difficult to decompose, was the best for accumulating carbon in soil.

**Keywords:** upland soil, soil carbon, organic matter

**Financial support:**

#### (2131 - 3147) The effect of bamboo powder application on the yield of Japanese white radish (*Rhaphanus sativus* L.) and soil properties

Atsunobu Kadono<sup>1</sup>; Yasutaka Inoue<sup>2</sup>; Tamaki Nanjo<sup>2</sup>; Ayumi Fukumoto<sup>2</sup>; Kaoru Kominami<sup>2</sup>; Kota Migishita<sup>2</sup>

Tottori University of Environmental Studies<sup>1</sup>; Tottori University of Environmental<sup>2</sup>

The application of organic matter on soils have been studied widely because of its positive effects on carbon sequestration and the diversity of soil ecosystems. We tested different dose (30, 3 and 0 Mg/10a) of bamboo powder to enhance the amount of soil organic carbon (SOC) and microbial biomass and diversity in a soil under the growth of Japanese white radish (*Rhaphanus sativus* L.). SOC was measured by a dichromate oxidation method, microbial biomass by substrate induced respiration method and microbial diversity by

BIOLOG method. We found significant increase of SOC, microbial biomass and microbial diversity in the high dose site, while the yield was significantly lower than the none dose site. After the observation in the field and some additional experiments *in vitro* to confirm that the high amount of organic amendment caused inhibiting effect on the yield of the radish, we might conclude the lower oxygen concentration (probably with the higher hydrogen sulfide concentration) in the soils in the high dose site attributed the lower yield.

**Keywords:** carbon sequestration, microbial biomass, microbial diversity, reduction

**Financial support:**

#### C3.3.6 - Sustainable phosphorus fertilizer use in tropical soil

##### (5015 - 1783) Agronomic characteristics of *Brachiaria ruziziensis* grass in response of different doses of phosphorus

Renan Marré Biazatti<sup>1</sup>; Lucas Vinícius Albuquerque de Oliveira<sup>1</sup>; Rogério Gonçalves Teixeira<sup>1</sup>; Pablo Rogério Ciechorski<sup>1</sup>; Ramaiani Lohanny Sousa Cremer<sup>1</sup>

Fundação Universidade Federal de Rondônia<sup>1</sup>

Choose of forage and a chemical equilibrate fertilization, in formation of pasture are the base for a cattle breeding highly productive. In this context a forage specie very used is *Brachiaria ruziziensis* that have a good develop in wet conditions but no flood. However, like all agricultural production, this grass has limitations according to the fertilization of the soil, principally with the phosphorus availability. So that being, the study search consider the best dose of triple superphosphate fertilization that express the best increase o dry mass, that is the agronomic characteristic more searched in the extensive cattle. There was five treatments in different doses (0, 100, 200, 400 e 800 Kg.ha<sup>-1</sup>) with four repetitions each, conducted in polyethylene vessels. The dry mass was evaluated in 30 and 60 days, the dose of 400 Kg.ha<sup>-1</sup> was indicated the most expressive of dry mass production. In 60 days, the dose with more significant results was 800 kg.ha<sup>-1</sup>. The justification of these results is due to the essentiality of the mineral phosphorus, which participates in the production of vegetal energy, negatively affecting the accumulation of photo-assimilated. When it compared to the control treatment (with no fertilizer) there was an increase almost 2-fold in dry mass production. Therefore, was observed that the phosphorus affect directly the initial growth and subsequently the forage development. Thus this higher productivity reflect in the management activity of the extensive cattle, is that can reduce increasingly the nutritional increments of cattle feed with mineral rations.

**Keywords:** Key words: Forage; Phosphate fertilizer; Dry mass

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##### (9148 - 2658) Agronomic response to different doses and forms of application of organomineral phosphate fertilizer produced with chicken manure

Jerusa Maia e Sá<sup>1</sup>; Adelson Paulo de Araújo<sup>1</sup>; José Carlos Polidoro<sup>2</sup>; Paulo César Teixeira<sup>2</sup>; Bianca Braz Mattos<sup>2</sup>; Vinícius de Melo benites<sup>2</sup>

Federal Rural University of Rio de Janeiro<sup>1</sup>; Embrapa Soils<sup>2</sup>

The efficiency of phosphate fertilization is very low because of the chemical, physical, and mineralogical characteristics of the soil and of the solubility, composition, and physical structure of the fertilizer. Organomineral fertilizers can supply part of the nutrient demand to crops and ensure better management of agricultural waste. Peak application of P represents a practical way to expedite the implantation step in grain crops. The objective of this work was to evaluate the agronomic performance of an organomineral fertilizer (FOM) produced from chicken manure, in relation to the use of soluble

phosphate fertilizers, in different fertilizer application forms. Maize and soybean were cultivated in succession in a sandy loamy Yellow Latosol with corrected fertility in Luis Eduardo Magalhães, BA. The experimental design was a randomized complete block design in a  $3 \times 3 \times 2 + 1$  factorial arrangement with 4 replicates, combining FOM, monoammonium phosphate (MAP) and single superphosphate (SSP) fertilizers, applied in three doses (40, 80 and 160 kg ha<sup>-1</sup> of P<sub>2</sub>O<sub>5</sub>), with fertilization in total area cover or buried in the sowing furrow, in addition to a control without P. The accumulation of phytomass in maize (at 21, 63, 84 and 148 days after emergence - DAE) and soybean (at 36, 44, 82 and 104 DAE), the productivity and accumulation of P in the grains were evaluated. There was no response to increased doses on productivity. Localized fertilization promoted greater accumulation of phytomass, productivity and P accumulation in maize. There was no residual effect of the fertilization form on the agronomic variables evaluated in soybean in succession. Therefore, the phosphate application in total area presents a promising possibility to practice the stage of implantation of grain crops. FOM and MAP provided greater accumulation of P in the grains in relation to SSP. The results indicate good potential of using chicken manure as a component of organomineral formulations.

**Keywords:** phosphorus, *Zea mays*, *Glicine max*, fertilizer sources, no tillage

**Financial support:** Embrapa Soils; FertBrasil Network; Colorado Farm; Rural Union of Luis Eduardo Magalhães, BA

**(9096 - 922) Chemical attributes of the soil in pasture area arising from application form of phosphorus doses after seven years in western Amazon**

Andressa Gregolin Moreira<sup>1</sup>; Edinelia Roos<sup>1</sup>; Bianca Souza Selhorst<sup>1</sup>; Adriele Laurindo Sobreira<sup>2</sup>; Vanessa Rodrigues de Brito<sup>1</sup>; Jairo André Schindwein<sup>2</sup>; Fábio Régis de Souza<sup>1</sup>; Elaine Cosme Fiorelli-Pereira<sup>1</sup> Federal University of Rondonia, Av. Norte Sul, 7300, Nova Morada, Rolim de Moura - RO, CEP 76940-000, Brazil<sup>1</sup>; Federal University of Rondonia, Av. Presidente Dutra, 2965, Centro, Porto Velho - RO, CEP 76801-974, Brazil<sup>2</sup>

This work had as objective evaluate the alterations of chemical attributes of soil arising from application forms of phosphorus doses in cultivated soil with *Brachiaria brizantha* after seven years (2010-2017). The experiment was developed in a property in the municipality of Rolim de Moura, Rondônia, Brasil in an Oxisol, representative of the major pasture areas on Rondônia, on October 2010 to July 2017. The pasture was found established more than 10 years with no management of correct fertilization. The experimental design was in randomized blocks, in a factorial scheme 5x2, five doses of phosphorus (0, 100, 200, 400 and 800 kg ha<sup>-1</sup> o P), and two applications form of phosphorus on soil (surface and incorporated with subsoiling). Was realized the collect in two depth 0,0-0,10 and 0,10-0,20 m. The chemical analyses were incurred using standards methods. The attributes evaluated were pH in water, levels of changeable Al, P, Al+H and organic matter of soil. There was no interaction with phosphorus dose and the form application of P in any of the studied factors, in two depth 0,0-0,10 and 0,10-0,20 m. The variations of P doses promoted alterations in pH in the two depths studied linearly. The soil phosphorus in the layer 0,0-0,10 m had a quadratic behavior with rising doses of P, and at the highest dose 800 kg ha<sup>-1</sup> of P obtained 3 mg dm<sup>3</sup> of P, (Al+H) the results were similar of phosphorus in the same layer. The level of changeable Al in the 0,10-0,20 m layer linearly reduced with rising doses of P. After seven years the phosphorus application, any studied factors interacted with the applications form. However the variations in the doses of P promoted alterations in the residual form of concentrations of P and Al+H in the depth soil at 0,0-0,10m and in the changeable Al in the 0,10-0,20 layer.

**Keywords:** pasture degradation, subsoiling, soil fertility.

**Financial support:** Universidade Federal de Rondônia, CAPES.

**(7696 - 1564) Diffusion flow of phosphate sources in different contact time**

Miguel Martins Neto<sup>1</sup>; Maila Adriely Silva<sup>2</sup>; Gustavo Ferreira de Sousa<sup>2</sup>; Paulo Henrique Soares<sup>1</sup>; Murilo Mendes Machado<sup>1</sup>; Carlos Henrique Eiterer de Souza<sup>1</sup>

Centro Universitário de Patos de Minas<sup>1</sup>; Universidade Federal de Lavras<sup>2</sup>

Due to the high levels of weathering in the tropical region, there is a greater index of phosphorus adsorption, therefore, technologies has been seek to increase the phosphates sources efficiency. Thereby, the objective of this study is evaluate the diffusion flow of the polymer-coated and conventional phosphates fertilizers, in different contact time. The experiment was conducted at the laboratory Central de Análises e Fertilidade de Solo – CEFERT, located at Centro Universitário de Patos de Minas – UNIPAM in Patos de Minas, Minas Gerais State, Brazil. A randomized complete block design was used, in factorial scheme (4 x 6), with 4 phosphate sources (Conventional monoammonium phosphate [MAP], polymer-coated MAP, conventional triple superphosphate, polymer-coated triple superphosphate) and 6 times (3, 6, 14, 21, 40 and 60 days after the application). To the experiment conduction, were used samples of dystrophic red latosol with clayey texture, they were dry, sifted to 2 mm to get the air-dry soil. Incubation chambers with 0,25 dm<sup>3</sup> of volume were used as experimental unit. To the determination of the diffusion flow, the resin anion was used. The used resin was the AMI-7001S treated with sodium bicarbonate with 2,5 x 5 cm of dimensions. To the incubation chambers assembly 1/3 of the soil was put it and inserted the resin on the horizontal position, after that, it was added more 1/3 of the soil, put the fertilizer parallel to the resin and finally covered with the rest of the soil. After the assembly, the soil was irrigated with 80% of the field capacity and the chambers were closed. The data were submitted to the variance analyses, and the sources were compared with Tukey test 5% and adjusted to the regression model. There was interaction between the source and time, at the conventional and polymer-coated MAP had the decreasing regression linear adjustment. On the day 3, the conventional MAP showed higher values of diffusion flow than the polymer-coated, on the following times, the polymer-coat source was superior, this happened because of the slow-release provided by polymer, also reduce the phosphorus direct contact with the soil colloids, minimizing the loss of that nutrient by the adsorption process on the clay mineral. Concluded that the diffusion flow from conventional MAP in a short time is better, and the polymer-coated is more efficient in a prolonged time.

**Keywords:** Key Word: Diffusion, Phosphorus, Polymer

**Financial support:** Centro Universitário de Patos de Minas

**(2994 - 2383) Diffusion of phosphorus from granular monoammonium phosphate with different proportions of phyllosilicate in Oxisols of Brazil**

Marco Antonio Pereira de Ávila<sup>1</sup>; Paula Castanho Borges<sup>2</sup>; Thiago Cardoso de Oliveira<sup>3</sup>; Takashi Muraoka<sup>3</sup>

University of São Paulo, Center of Nuclear Energy in Agriculture (CENA/USP), 303 Centenário Ave, Piracicaba, Zip Code 13416-000, São Paulo State, Brazil. (marcopereiraavila@yahoo.com.br)<sup>1</sup>; São Paulo State University (UNESP)<sup>2</sup>; University of São Paulo, Center of Nuclear Energy in Agriculture (CENA/USP)<sup>3</sup>

Phosphorus (P) is an essential element for agriculture worldwide and is considered one of the most limiting nutrients of crop yield. Soils in Brazil have low P content available to plants and soluble phosphate fertilizers have low performance due to complex reactions, from the