

## Soil carbon stock in integrated crop-livestock-forest system in the Central Region of Minas Gerais

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The adoption of sustainable practices such as tillage, integrated crop-livestock-forest (ICLF), use of cover crops with high C:N ratio, are essential to maintain or increase the quantity and quality of soil organic matter (SOM), contributing to the improvement of physical, chemical and biological soil attributes. A trial was conducted at EPAMIG Experimental Farm, Prudente de Moraes, Minas Gerais, in a Yellow Red Latosol. The aim was to evaluate the influence of different eucalyptus structural arrangements, location and depth of soil sampling on the total stock of carbon in the soil in an ICLF system. The experimental design was a randomized complete block in a split plot, with three replications. Eucalyptus arrangements: double rows (3 x 2) x 20 m; (2 x 2) x 9 m and single rows (9 x 2 m) were distributed in the main plots, with 20 and 9 m between rows and 2 m between tree spacing. The soil sampling sites (center and under the canopy) were in the subplots and soil sampling depth (0 - 20 and 20 - 40 cm) were in the sub-subplots. Organic C stocks were calculated based on layers depth and equivalent mass of soil. In a contiguous area and under the same fertilization conditions, soil was sampled in a monoculture of maize grow at full sunlight, in a pasture at full sunlight, in an area with a conventional eucalyptus arrangement (3 x 3 m), and in a native Cerrado to make a comparison with the ICLF system. There were not differences between eucalyptus arrangements and the sampling site for the soil total organic carbon (TOC). The period of three years after the system implementation, was considered insufficient to cause changes on the SOM. In all eucalypt arrangements, the highest amount of TOC in the soil was recorded in the 0 - 20 cm depth with a medium value of 40 Mg ha<sup>-1</sup>, with an increase of 14% over the value registered in the 0-40 cm layer. When comparing the ICLF system with other management systems, it was observed that there was no difference in TOC levels in the two sampling depths of soil for pasture cultivated at full sunlight. In turn, soil from native Cerrado vegetation showed higher values of TOC in the layer of 20 - 40 cm. The pasture at full sunlight showed the highest TOC content in the soil (62 Mg ha<sup>-1</sup>).

**Keywords:** agroforestry, eucalyptus, soil organic matter, *Urochloa decumbens*

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## Certificado

Certificamos que o trabalho intitulado "***Soil carbon stock in integrated crop-livestock-forest system in the Central Region of Minas Gerais***" de autoria de "**Maria Celuta Machado Viana, Igor F. Rezende, Francisco Morel Freire, Ramon Costa Alvarenga, Regis Pereira Venturin, Maria Helena Tabim Mascarenhas, Matheus H.C. de Paula, Elizabete P. Barbosa**" foi apresentado na forma de pôster durante a 53ª Reunião Anual da Sociedade Brasileira de Zootecnia, realizada de 01 a 04 de agosto em Gramado/RS.

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Iran Borges  
Presidente da Sociedade  
Brasileira de Zootecnia

Gramado, 04 de agosto de 2016.

Paulo César de Faccio Carvalho  
Coordenador da 53ª reunião da  
Sociedade Brasileira de Zootecnia

