



Enzyme activity as quality indicator of soil under agroforestry systems in the Brazilian Cerrado

Demétrio S. MEDEIROS^{1*}, Luís F. STONE², Agostinho D. DIDONET², Enderson P. B. FERREIRA²

¹IFGoiás, R. 75, 46 - St. Central, Goiânia - GO, 74055-110, GO, Brazil. ² Embrapa Arroz e Feijão, CP 179, 75375-000, Santo Antônio de Goiás, GO, Brazil;

E-mail address of presenting author*: demetriosantana@hotmail.com

Introduction Agroforestry production systems (APS) can be considered a way to produce causing low environmental impact. Besides, APS can be advantageous over conventional agricultural management, since they can offer increased productivity, economic benefits, and more diversity by increasing the possibilities of use a greater number of crops in an economic way. In this presentation, we report the effects of 4 years of two APS installed in the Brazilian Cerrado on soil enzyme activity.

Material and Methods

Two APS with focus on the production of grains (common bean and maize) and energy (sunflower and sesame) were installed in an area of grain production (16°29' S, 49°17'W, 787 m alt) at the Embrapa Rice and Beans Research Center, Santo Antônio de Goiás, in 2010. The trees composing the APS were: angico, baru, aroeira, cagaita, angelim, farinha seca, ingá, and pequi. Grain and energy crops were sown in the tree interlines after crotalaria, sorghum and fallow, as soil covering. Soil samples were taken in 0-20 cm layer, in the plots and in the tree lines, and total enzyme activity (FDA), b-glucosidase and acid phosphatase were determined as described by Ferreira et al. (2011) and compared to those under the native vegetation.

Results and Conclusions

Over a 4-year period, the treatments in continuous cropping APS with energy crops showed lower differences among them, but higher differences from the forest as compared to APS with grain crops (Fig. 1). Within the plots of grain crops (Fig. 1B), treatments with crotalaria and maize tended to group together, while common bean after sorghum and fallow formed another group.

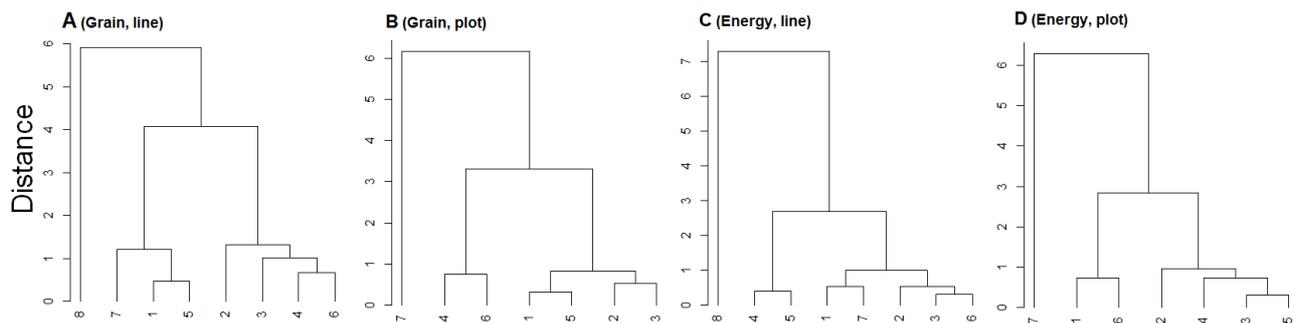


Fig. 1. Clustering dendrogram of treatments under APS for grain production (A and B) and energy (C and D). Treatments in the line of trees (A and C): 1- angico/baru, 2- aroeira/baru, 3- aroeira/cagaita, 4- angelim/cagaita, 5- angelim/pequi, 6- farinha seca/pequi, 7- ingá and 8- forest. Treatments in the plots of grain APS (B): 1- crotalaria/maize, 2- crotalaria/bean, 3- sorghum/maize, 4- sorghum/bean, 5- fallow/maize, 6- fallow/bean, and 7- forest. Treatments in the plots of energy APS (D): 1- crotalaria/sesame, 2- crotalaria/sunflower, 3- sorghum/sesame, 4- sorghum/sunflower, 5- fallow/sesame, 6- fallow/sunflower, and 7- forest. Data are means of 4 replicates.

References cited

Ferreira et al. (2011) *Bragantia*. 70: 899-907.