Carbon content in sandy soils under different use and management systems

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Introduction. Quantifying soil carbon content is important to assess soil indicators related to adequate management conducted by producers in their agricultural systems. The objective of this study was to evaluate the total soil carbon content in soils under different use and management systems.

Material and Methods. The experiment was conducted in a sandy soil (Quartzpsamment) with clay content lower than 3%. Soil use and management systems, evaluated as treatments, were: eucalyptus forest with 18 months of planting , trees spaced by 4 x 2 m (EUC); degraded pasture of *Brachiaria decumbens* cv Basilisk (PAST), and natural vegetation of Cerrado (CER). Soil samples for total carbon analysis content (C) and soil density (Ds) were carried out between December, 2013 and March, 2014. Samples were taken in four replications for each treatment and soil depth. Determination of soil C was done with a NC analyzer (Sumika Chemicals Sumigraph-NC 900), in accord with Kanda et al. (2004). Soil density (Ds) was evaluated as EMBRAPA (1997).

Results and Conclusions. In the treatments studied: soil use and management systems, the lowest carbon content was found in the eucalyptus forest (EUC). On the other hand, largest C values were measured in the natural vegetation (CER), followed by Brachiaria pastures (PAST). Differences related to soil carbon content were statistically different among treatments in the first 20 cm depth. Below this, it

was not observed significant differences for each measured soil layer. Although there was a trend for higher values in CER, with depth, no differences were observed when compared to managed areas.

Table 1. Carbon contents and soil density in different management systems and depths.

Depth (cm)	Soil carbon			Soil density		
	EUC	PAST	CER	EUC	PAST	CER
	--------------------	C %	-------------------	-------------------	Ds g dm^{-3}	---------------
0-5	0,500 Ac	0,757 Ab	1,150 Aa	1,36	1,45	1,27
5-10	0,407 ABb	0,510 Bab	0,577 Ba	1,46	1,60	1,39
10-20	0,332 ABCb	0,402 BCab	0,482 BCa	1,53	1,59	1,46
20-30	0,235 BCDa	0,267 CDa	0,307 CDa	1,56	1,58	1,53
30-40	0,217 CDa	0,220 CDa	0,295 Da	1,54	1,56	1,54
40-60	0,177 CDa	0,202 Da	0,260 Da	1,59	1,55	1,54
60-80	0,145 Da	0,147 Da	0,212 Da	1,57	1,56	1,55
80-100	0,132 Da	0,142 Da	0,147 Da	1,58	1,55	1,50
Mean	0,268 c	0,331 b	0,429 a	1,53	1,55	1,47

Means followed by the same capital letters in the column and small letters in the line do not differ -Tukey ($P>0.05$).

References

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