Physical Oxisols attributes due to crop diversification during the sugarcane fallow period

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Introduction

Crop diversification during the sugarcane fallow period can improve physical soil attributes, increasing the yield potential of the following sugarcane cycle.

Objective

The objective of this study was to evaluate the influence of different soil uses during the sugarcane fallow period before next sugarcane cycle, on the physical Oxisols attributes.

Material and Methods

- Brazil: 21°14'05" S, 48°17'09" W
- eutroferric Oxisol very clayey (680 g kg^{-1}) and acric Oxisol clayey (440 g kg^{-1})
- treatments:

Sc/Sb/Sc, Sc/Sb/Fa/Sb/Sc, Sc/Sb/Mi/Sb/Sc, Sc/Sb/Sh/Sb/Sc

Sugarcane, Soybean , Fallow, Millet, Sunnhemp

- soil samples at 0 - 0.10 and 0.10 - 0.20 m: after 1st Sc harvest
- water aggregate stability index (ASI), aggregate mean weight diameter (MWD), bulk density (BD), total porosity (TP), macroporosity (MAC), and microporosity (MIC)

Results

	ASI %	MWD mm	BD Mg m^{-3}	TP m^3 m^{-3}	MAC m^3 m^{-3}	MIC m^3 m^{-3}
eutroferric Oxisol	0 - 0.10 m					
Sc/Sb/Sc	77	2.68	1.50 a	0.49 b	0.03	0.46
Sc/Sb/Fa/Sb/Sc	74	2.50	1,46 ab	0.50 b	0.03	0.47
Sc/Sb/Mi/Sb/Sc	76	2.45	1,42 b	0.52 a	0.04	0.48
Sc/Sb/Sh/Sb/Sc	72	2.49	1.45 ab	0.51 ab	0.04	0.47
acric Oxisol	0 - 0.10 m					
Sc/Sb/Sc	66	2.98 a	1.70	0.42	0.04	0.38
Sc/Sb/Fa/Sb/Sc	63	2.18 b	1.70	0.40	0.03	0.37
Sc/Sb/Mi/Sb/Sc	63	2.55 ab	1.69	0.41	0.04	0.37
Sc/Sb/Sh/Sb/Sc	65	2.06 b	1.70	0.41	0.04	0.37
acric Oxisol	0.10 - 0.20 m					
Sc/Sb/Sc	64 a	2.48	1.72	0.42	0.05	0.37
Sc/Sb/Fa/Sb/Sc	55 b	2.23	1.67	0.41	0.05	0.36
Sc/Sb/Mi/Sb/Sc	59 ab	2.27	1.68	0.40	0.04	0.36
Sc/Sb/Sh/Sb/Sc	55 b	2.42	1.72	0.40	0.04	0.36

Conclusions

The results showed that the use soybean/millet/soybean during the sugarcane fallow period promoted better physical Oxisols quality.