Distinguished accumulation of organic matter fractions drives total carbon in tropical cultivated soils

Introduction

Physical granulometric fractions of soil organic matter have distinct dynamics and can be used to predict the positive or negative impact by agricultural crops, specially for the C.

Detailed assessments of the soil organic component are appropriate when the aim is to expand the understanding of the synergisms between the soil types through texture variation and cultivation systems, as a condition for increasement and stabilization of C in tropical cultivated soils.

This study aims to quantify C in the soil organic matter fractions under natural vegetation and agricultural of the brazilian Cerrado biome (Brazilian Savanna) and indicate the best conditions for increasing C.

Methods

On farms and in short and long-time experiments soil samples were collected in the 0 to 10 cm layer.


Natural vegetation


Pasture


Soybean/Corn

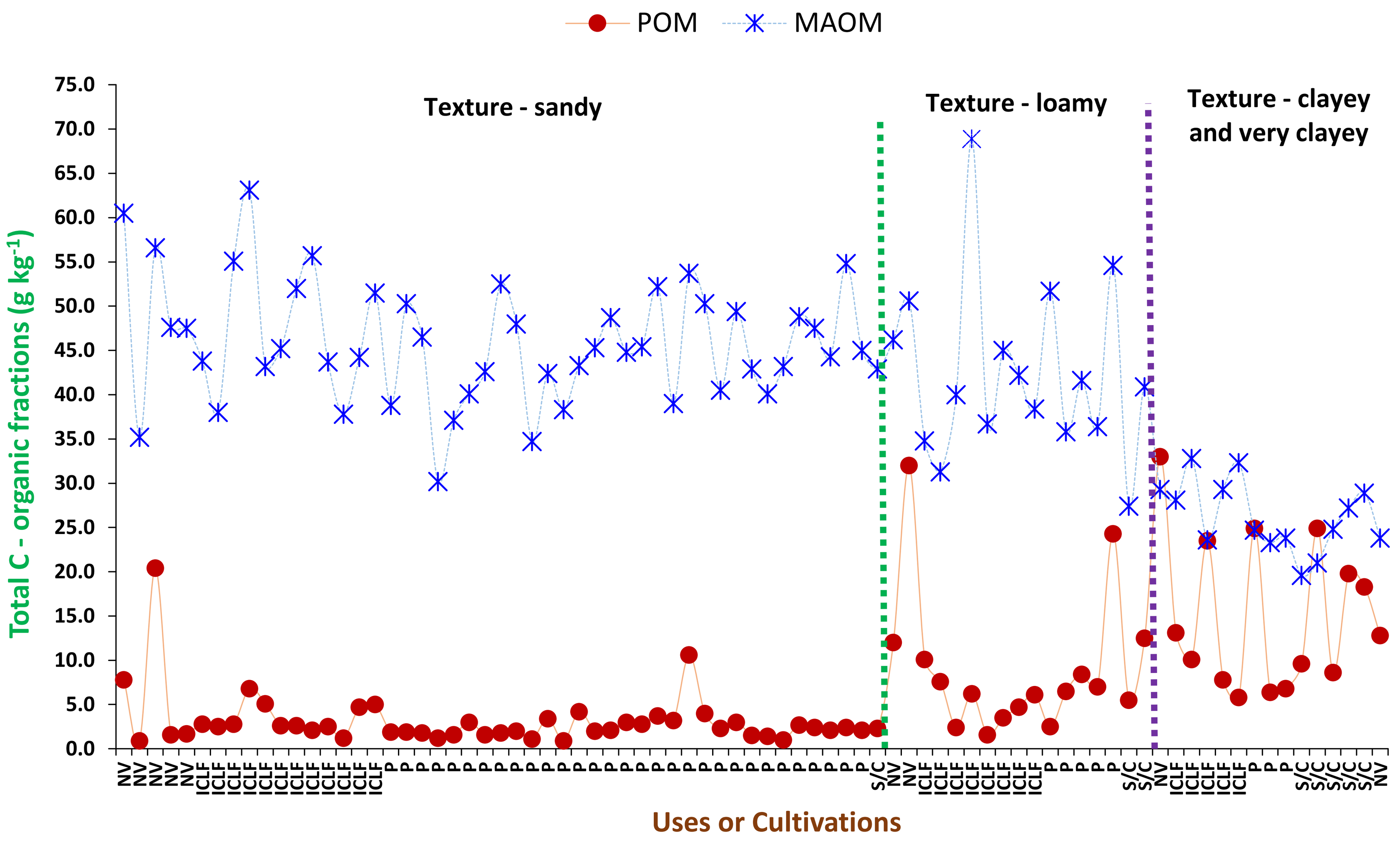

Integrated Livestock-Forest


Integrated Crop-Livestock

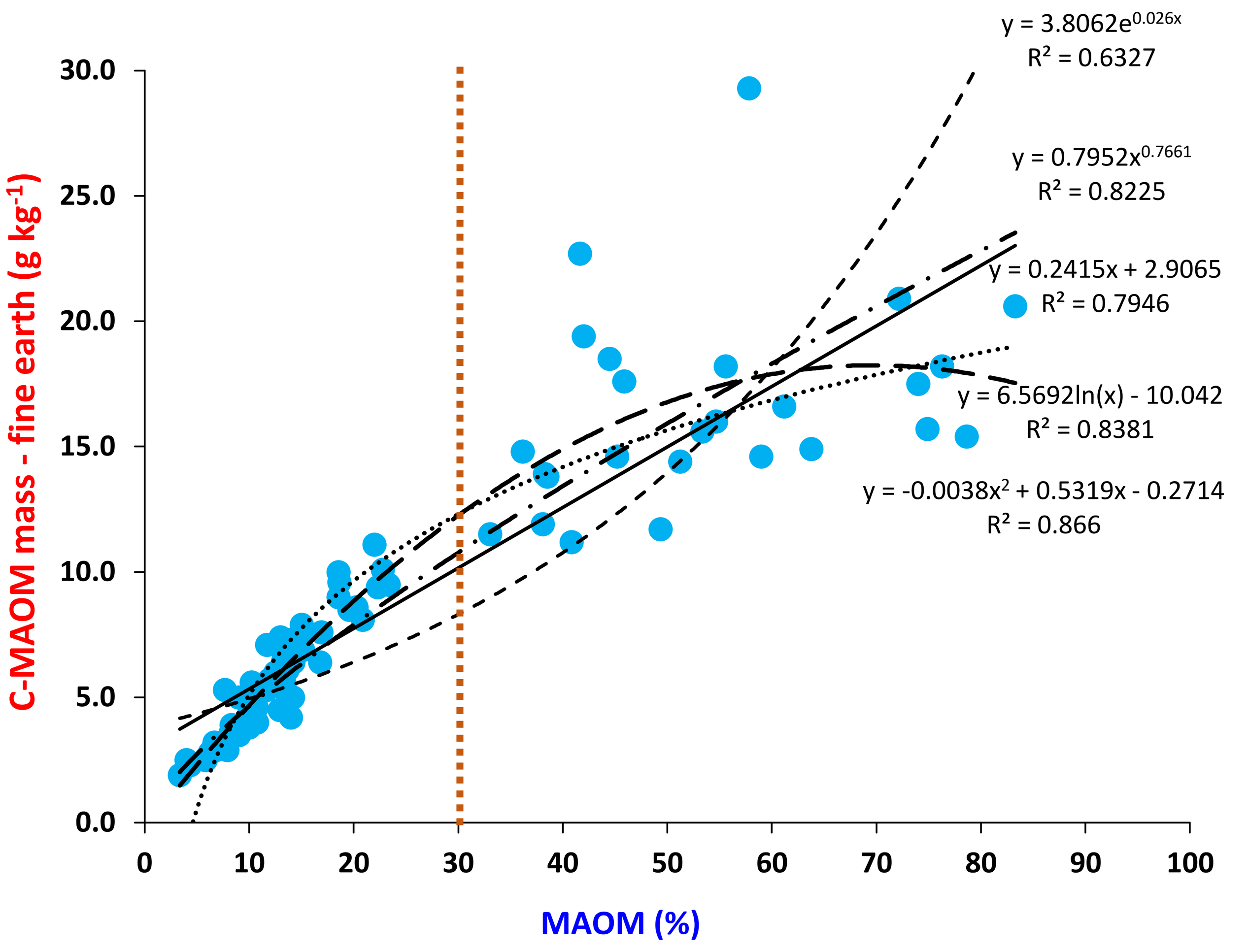

Integrated Crop-Livestock-Forest

Texture classes and total carbon of particulate organic matter (C-POM) (2.00 to 0.053 mm) and of mineral associated organic matter (C-MAOM) (<0.053 mm) were obtained.

Results and discussion



NV: Natural vegetation; **ICLF:** Integrated Crop-Livestock-Forest; **P:** Pasture; **S/C:** Soybean/Corn



Conclusion

Soils <30% silt+clay provide greater gains in a short time in C-MOP, while, soils ≥30% silt+clay provide gains in a medium to long time in both fractions (C-POM and C-MAOM).

Recommendations: i) soils <30% silt+clay: pasture in a continuous manner or as rotation and/or intercropping maintaining the highest proportion of grasses species ; ii) soils ≥30% silt+clay: similar proportions of grasses and legumes, or other species.

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