

Impact of horticulture at no-till system on soil organic matter in the Atlantic Forest biome

Eduardo de SáMendonça

Abstract:

Horticulture in the hilly region of Atlantic Forest biome is leading to land misuse reducing the productive capacity of soils due to decreasing soil organic matter content and soil nutrients. A field study was carried out to investigate the effect of horticulture at no-till system (SPDP) on soil organic matter pools in the hilly region of Atlantic Forest biome. Three family farmers with 3, 5 and 9 years of SPDP were selected. For each area in SPDP, 1 forest area and 1 area under conventional system (SPC) were selected, geographically close, as comparatives. Soil sampling was carried out in August 2019 at depths of 0-10 and 10-20 cm. The variables analyzed were total organic carbon (TOC), total nitrogen (NT), mineralizable nitrogen (Nmin), C and N in the microbial biomass (CBM and NBM). Areas with 5 and 9 years of SPDP had greater amount of TOC and NT than areas in SPC at both depths and did not differ from the reference forest at the depth of 10-20 cm. The Nmin of area with 5 years of SPDP was higher to the area in SPC at both depths. The CBM of area with 5 years of SPDP was superior to the area in SPC and did not differ from the reference forest at a depth of 0-10 cm. The NBM was not increased by the SPDP in relation to SPC, but their contents were lower than the contents of reference forest. It is concluded that SPDP may improve soil organic matter pools and N cycling in the soil-plant system, enhancing the production of horticulture in the region. No-till horticulture system is a strategy to sequester and increase soil C in the hilly Atlantic Forest biome. This system should be encouraged to the farmers in order to improve soil quality in the region.

Keywords: microbial biomass, carbon, nitrogen, mineralizable nitrogen.

Financing: Fapes, Incaper, Union of rural workers and family farmers in Santa Maria de Jetibá, UFES.

Professor Eduardo de SáMendonça works at the Agronomy Department, Federal University of

Latest advances in the field of Plant science, Agriculture and Engineering

Espírito Santo. His main research areas, for 28 years, are soil organic matter dynamic in tropical ecosystems and dynamic and modeling of nutrients in organic agriculture and agroecological ecosystems.

Recent Publications

Stauffer, E.; Andrade, F. V.; Mendonça, E. S.; Polidoro, J. C. Enhanced-efficiency phosphate fertilisers, diffusive flux of phosphorus and matric potential in Acrudox. *Soil Research.* , v.1, p.1 - 7, 2020.

Prates Júnior, P.; Moreira, B.C.; Silva, M.C.S.; Veloso, T.G.R.; Sturmer, S.L.; Fernandes, R.B. A.;

Mendonça, E.S.; Kasuya, M.C.M. Agroecological coffee management increases arbuscular mycorrhizal fungi diversity. *PLoS One.*, v.14, p.e0209093 - , 2019.

Maia, S.M.F.; Otutumi, A.T.; **Mendonça, E.S.**; Neves, J.C.L.; Oliveira, T.S. Combined effect of intercropping and minimum tillage on soil carbon sequestration and organic matter pools in the semiarid region of Brazil. *Soil Research.*, v.1, p.1 - , 2019.

Stauffer, E.; Andrade, F.V.; **Mendonça, E. S.**; Donagemma, G.K. Enhanced efficiency phosphate fertilizers and phosphorus availability in Acrudox. *Aust J Crop Sci.* , v.13, p.61 - 68, 2019.

Sá, M.M.F.; Schaefer, C.E.G.R.; Loureiro, D.C.; Simas, F.N.B.; Alves, B.J.R.; **Mendonça, E.S.**;

Figueiredo, E.B.; La Scala, N.; Panosso, A.R. Fluxes of CO₂, CH₄, and N₂O in tundra-covered and Nothofagus forest soils in the Argentinian Patagonia. *Science Total Environment.* , v.659, p.401 - 409, 2019.

Nóbrega, G.N.; Ferreira, T.O.; SiqueiraNeto, M.; **Mendonça, E.S.**; Romero, R.E.; Otero, X.L. The importance of blue carbon soil stocks in tropical semiarid mangroves: a case study in Northeastern Brazil. *Environmental Earth Sciences.*, v.78, p.369 - 379, 2019.

Biography:

Maria da Penha Angeletti¹, Laura VaillantRibeiro Mauri¹, Lenita Julia Bolsan², Eduardo de Sá

Mendonça^{2,3}

¹Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural (Incaper),

penhangeletti@incaper.es.gov.br; vaillant.lr@gmail.com; ²Universidade Federal do Espírito Santo (Ufes-CCA),

lenita.bolzan@hotmail.com.br; eduardo.mendonca@ufes.br.³Speaker.