+61 3 6231 2999 mail@conferencedesign.com.auSoil Organic Matters

Abstracts

Intensification of no-till agricultural systems: An opportunity for carbon sequestration

C sequestration – opportunities - costs - trade-offs, Oral Presentation

Dr Rodrigo Nicoloso[1], Dr. Charles Rice[2]

[1]*Embrapa, Concordia, Brazil,* [2]*Kansas State University, Manhattan, United States*

No-till is the key component of conservation agriculture adopted over 125 million hectares worldwide in order to address an ever-growing demand for soil and water quality, food security, and climate change adaptation and mitigation. However, as the French Government launched the '4 per 1000 Initiative' at the COP21 promoting soil carbon sequestration (at 0.4% per year) as an alternative to halt the increase in atmospheric CO2, a long-lasting debate aroused on the potential of conservation agriculture to promote carbon sequestration. Previous reviews reported no differences on carbon storage in the deep profile of no-till and tilled soils, questioning the role of no-till soils in climate change mitigation. Here we present the results of a global meta-analysis of studies assessing carbon and nitrogen storage and sequestration in no-till soils from the most important agricultural regions of the world. Overall, our results show that no-till soils store both more carbon and nitrogen (up to 100 cm depth) than tilled soils in contrast with previous findings. However, carbon sequestration depended on the increase of crop frequency and nitrogen inputs in association with decreased soil disturbance. Single cropping of fallowing systems lacks carbon inputs to maintain soil carbon throughout the soil profile. However, double-cropping systems led to a decrease in soil nitrogen that may constrain future carbon sequestration whereas the use of legumes showed to alleviate nitrogen losses and supply extra nutrient to support carbon sequestration. Briefly, our findings indicate that no-till can effectively mitigate climate change by either avoiding CO_2 emissions from tilled soils or by promoting soil carbon sequestration in intensified agricultural systems.

Biography:

Rodrigo Nicoloso is a researcher at the Brazilian Agricultural Research Corporation (EMBRAPA). His research focuses on greenhouse gases emissions from animal manure treatment and recycling in agriculture, soil organic matter dynamics and stabilization in tropical and temperate agroecosystems, and on the development of risk assessment tools to quantify the potential for phosphorus runoff from agricultural fields.

*Previous article*Temporal dynamics of litter quality, soil types and microorganisms as main drivers of the priming effect
Next article Biomarker and spectroscopic evidence for microbially stabilized organic matter in an eroded landscape

SOIL ORGANIC MATTER

7th International Symposium
Soil Organic Matter

6 – 11 October 2019

Hilton Adelaide

Adelaide, South Australia

Australia

Conference Managers

Please contact the team at Conference Design with any questions regarding the conference.

- + 61 3 6231 2999
- mail@conferencedesign.com.au
- www.conferencedesign.com.au

Connect