

EGU2010 Webstreaming

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Press Conferences

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Tuesday, 4 May 2010 | Great Debate

- To what extent do humans impact the Earth's climate? | 12:15–13:15

Wednesday, 5 May 2010 | Union Award Presentations and Medal Lectures

- Welcome/Introduction | 13:30
- Farewell Session for Arne K. Richter | 13:35
- Union Medal & Award Ceremony | 15:30
- Gerhard Haerendel – Fascinating Plasma Structures (Jean Dominique Cassini Medal Lecture) | 16:15
- Roland von Huene – Subduction Zone Concepts and the 2010 Chile Earthquake (Arthur Holmes Medal Lecture) | 17:00
- Carlos A. Nobre – The Fate of the Amazon Forest in the 21st Century (Alexander von Humboldt Medal Lecture) | 17:45
- Jean-Yves Parlange – Wetting Front Instability in Porous Media (Alfred Wegener Medal Lecture) | 18:30

Thursday, 6 May 2010 | Great Debate

- Getting real about energy | 15:30–17:15



Correlations between soil respiration and soil properties in sugarcane areas under green and slash-and-burn management systems

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Soil management causes changes in soil physical, chemical, and biological properties that consequently affect its CO₂ emission. In this work we studied soil respiration (FCO₂) in areas with sugarcane production in southern Brazil under two different sugarcane management systems: green (G), consisting of mechanized harvesting that produces a large amount of crop residues left on the soil surface, and slash-and-burn (SB), in which the residues are burned before manual harvest, leaving no residues on the soil surface. The study was conducted after the harvest period in two side-by-side grids installed in adjacent areas, having 20 measurement points each. The objective of this work was to determine whether soil physical and chemical properties within each plot were useful in order to explain the spatial variability of FCO₂, supposedly influenced by each management system. Most of the soil physical properties studied showed no significant differences between management systems, but on the other hand most of the chemical properties differed significantly when SB and G areas were compared. Total FCO₂ was 31% higher in the SB plot (729 g CO₂ m⁻²) when compared to the G plot (557 g CO₂ m⁻²) throughout the 70-day period after harvest studied. This seems to be related to the sensitivity of FCO₂ to precipitation events, as respiration in this plot increased significantly with increases in soil moisture. Despite temporal variability showed to be positively related to soil moisture, inside each management system there was a negative correlation ($p < 0.01$) between the spatial changes of FCO₂ and soil moisture (MS), $R = -0.56$ and -0.59 for G and SB respectively. There was no spatial correlation between FCO₂ and soil organic matter in each management system, however, the humification index (Hum) of organic matter was negatively linearly correlated with FCO₂ in SB ($R = -0.53$, $p < 0.05$) while positively linearly correlated in G area ($R = 0.42$, $p < 0.10$). The multiple regression model analysis applied in each management system indicates that 63% of the FCO₂ spatial variability in G managed could be explained by the model: $FCO_2(G) = 4.11978 - 0.07672MS + 0.0045Hum + 1.5352K - 0.04474FWP$, where K and FWP are potassium content and free water porosity in G area, respectively. On the other hand, 75% of FCO₂ spatial variability in SB managed plot was accounted by the model: $FCO_2(SB) = 10.66774 - 0.08624MS - 0.02904Hum - 2.42548K$. Therefore, soil moisture, humification index of organic matter and potassium level were the main properties able to explain the spatial variability of FCO₂ in both sugarcane management systems. This result indicates that changes in sugarcane management systems could result in changes on the soil chemical properties, mostly, especially humification index of organic matter. It seems that in conversion from slash-and-burn to green harvest system, free water porosity turns to be an important aspect in order to explain part of FCO₂ spatial variability in green managed system.