

## ***Interactive comment on “Forest conversion to poplar plantation in a Lombardy floodplain (Italy): effects on soil organic carbon stock” by C. Ferré et al.***

**Anonymous Referee #3**

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This paper describe the changes occurring at the SOC pool after converting the natural vegetation to a poplar plantation in Northern part of Italy. The paper is generally well written and simply report real SOC data for both an area and a land use type poorly investigated and of great interest. It can be considered novel only for the considered type of land use change, despite the limited scope of the data presented. The investigation of the spatial heterogeneity of SOC distribution represent probably the strength of the paper. However there are some point to discuss. Why bulk density from deeper layers was estimated by a regression if 4-5 profiles were opened in each sites? Obviously the number of profiles is much smaller than sampling point in each sites but BD deriving from subsoil of the profiles could have allowed for a comparison with estimated

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BD trough the regression. Why you collected only fresh leaves from the forest floor? It seems from table 1 that the C concentration of the organic horizon is derived from those measurements. This is not the standard methodology for determining the C concentration on the organic horizon. Why you did not determine the C stock also in the horganic horizon collecting samples from a known area? The poplar had no organic horizon during the sampling campaign but this does not means that litter from trees does not accumulate on the soil. This occur only some months per year. The literature cited should be increased. Especially in the introduction is often cited the IPCC reports while some more scientific peer reviewed publication could be added. Be consistent trough the text whentechnical terminology used. SOC and C concentration refer to different things. The problem of the stones exceeding the volume of the cylinder used for BD should be better addressed due to its importance for SOC stock determination.

The literature on SRF is not so big, nevertheless there are some paper dealing with SOC changes and SRF (see some examples) that could be helpful form comparison: Don, A., Osborne, B., Hastings, A., Skiba, U., Carter, M. S., Drewer, J., Flessa, H., Freibauer, A., Hyvönen, N., Jones, M.B., Lanigan, G.J., Mander, Ú., Monti., A., Njaku Djomo, S., Valentine, J., Walter, K., ZEGADA-LIZARAZU, W., & Zenone, T. (2012). Land use change to bioenergy production in Europe: implications for the greenhouse gas balance and soil carbon. *GCB Bioenergy*,4(4), 372-391. Njakou Djomo, S., El Kasmoui, O., De Groote, T., Broeckx, L. S., Verlinden, M. S., Berhongaray, G., Fichot, R., Zona, D., Dillen S.Y., King J.S., Janssens I.A., & Ceulemans, R. (2013). Energy and climate benefits of bioelectricity from low-input short rotation woody crops on agricultural land over a two-year rotation. *Applied Energy*, 111, 862-870. The discussion of the results and the Conclusions of the paper should be improved. Especially the conclusions. At the moment the results seems quite obvious and not so surprising. Since this work is probably one of the first investigating the conversion of natural vegetation to another land use (SRf in this case) a bigger effort should be done in discussing the data.

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