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Interactive comment on "Accumulation of soil organic C and N in planted forests fostered by tree species mixture" *by* Yan Liu et al.

Anonymous Referee #1

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This manuscript shows the effects of mixed forests on the soil organic carbon and nitrogen stocks. This paper underline the benefits of mixed forests on the ecosystem functioning, and more precisely on a belowground compartment, which is largely underestimate. Currently, ecosystem services by soil, like carbon sequestration, are a hot topic and this paper bring some interesting results. The results are novel and very relevant for the future. I think the paper requires minor revision.

This study pointed the need to more information about the effect of mixed forest on soil C storage. The message is clear and concise and the manuscript is overall well written. The methods and statistical analyses seem appropriate. However, there are several critical issues should be further justified and/or addressed.

General comments: - About the chronosequence. In the materials and methods, your

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description is too short. We need more information about the soil type and soil management in different station. The conditions required for a site to be included in the chronosequence study were that, with the exception of time, all soil-forming factors had remained constant since forest establishment. Could you add a table with all these soil informations? - About deep soil. Could you justify the soil depth of your experimentation? Some recent papers underline that the carbon could be sequestered in a deeper soil layer, more than 50 cm, and in a very stable form: humified. In page 2 line22, you didn't show any results of studies with soil deeper than 20 cm. - About roots. Page 7 line 9, you wrote "..in the same site (data not published) also suggested fine roots. . ...". I think it will be a clear advance of this study to publish your data of roots here. With these data, you could confirm your pattern and highlight the distribution of carbon in the vertical and temporal ways. Roots data is quite difficult to obtain and it's a very relevant information. - What about the effect of more species? Could you add perspectives about that? And also the time effect after 45-yr ?

Specific comments: - P2, L11. Yes, but could you add the recent paper of Grossiord et al 2014 "Tree diversity does not always improve resistance of forest ecosystems to drought" doi: 10.1073/pnas.1411970111 - P4, L13-15. It's not clear. - P7, L7. Which soil depth ? - P7, L17. Need more information about "intraspecific competition". Competition for light and/or water? Do you have some results about that? There are some harvesting in pure stands during the chronosequence in order to decrease this competition? Roots data, could be nice also in this context. - Table 1. Could you add +/- SE (standard errors) in each value? - Table 2. P value = 0.0000, it's not realistic. I prefer P value < 0.0001 - Fig 3. Could you analyze also a differences among soil layers within the same stand? - Fig 4. Could you add a letters for significant differences?

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