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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.

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Dear editor and referee:

Thank very much for the comments and suggestions, which is quite helpful to improve our manuscript. The soil conditions remained constant without disturbance after planting. The soil types at two stations were similar, but there were differences between them before the forest established. As the field in Taolin forestry station was used for nursery. We used this site just due to the scarcity of young plantations in Hunan Botanic Garden. More importantly, our purpose here is to evaluate the admixing effects on soil OC and N stocks by comparing mixed forests and corresponding monocultures over time, not to estimate the soil carbon and stock in mineral soil, which is also quite important of course. Therefore this field site was also used. This is also related the questions

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you asked about the carbon sequestration in deeper soil layers, as we thought that the soil OC and N stock of shallow soil layer is most sensitive to tree species converting because of litter input by foliage and fine root turn over (Wang et al., 2013; Cremer et al., 2016). Of course, it is also quite intereting to know the C sequestration in the deeper soils. Regarding the fine root data, we are developing a manuscript for that. Here we only compared the two species mixtures with corresponding monocultures. It is quite interesting to know the diversity effects on soil C and N stocks when containing more species. But to find this kind of the field sites for this purpose are really difficult, even more difficult to find if the time effects were also considered. It is quite good suggestion adding some sentences about the perspectives of diversity effects containing more species and time effects after 45-yr.

Responses to the 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 Re: We will add that later.

P4, L13-15. It’s not clear Re: Re: Here we only calculated the additive or non-additive effects of C and N stocks in mixed plantation by comparing the measured C or N stock with expected value, which was calculated from C or N stock in monocultures. To justify the additive or non-additive effects, we applied the method suggested by Ball et al. (2008) “Ball, B. A., Hunter, M. D., Kominoski, J. S., Swan, C. M., and Bradford, M. A.: Consequences of Non-Random Species Loss for Decomposition Dynamics: Experimental Evidence for Additive and Non-Additive Effects, J. Ecol., 96, 303–313, 2008.” We will clarify them on the manuscript later.

P7, L7. Which soil depth ? Re: Her we divided the soil profiles to three layers (0-10cm, 10-20cm and 20-30cm). Here it refers the layer of 20-30 cm. we will clarify later in our manuscript.

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. Re: We do not have specific data for that, so far. As there was no harvesting or thinning here, we think this is the case. Maybe we should add some references here.

Table 1. Could you add +/- SE (standard errors) in each value? Re: this can be done later

Table 2. P value = 0.0000, it's not realistic. I prefer P value < 0.0001 - Fig 3 Re: You are right, we will correct it in the manuscript.

Fig 3. Could you analyze also differences among soil layers within the same stand? Re: we can add the significant differences information here.

Fig 4. Could you add letters for significant differences? Re: Here our purpose was to see the magnitude trend of admixing effect over time. It can be done if it is necessary.

regards, Pifeng Lei On behalf of co-authors

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