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Interactive comment on "^{14}C in cropland soil of a long-term field trial – in-field variability and implications for estimating carbon turnover" *by* J. Leifeld and J. Mayer

Anonymous Referee #2

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General comments The paper by Leifeld & Mayer is a very good short communication on the important and timely subject of using 14C to estimate turnover times of soil C. The authors make good use of an established long-term experiment and make a convincing argument for caution when converting pMC values to MRT values due to inherent soil variations. I recommend that this paper be published subject to minor revision outlined below.

Specific comment (referred to page (P) and line (L) number in the version I downloaded)

P219 L11 It is more typical to refer to 13C/12C (rather than 12C/13C).

P219 L18-19 Use 14C rather than radiocarbon (you have already introduced this).

P219 L22 Change 'constraints' to 'constrains'.

P219 L24 Change 'extent' to 'extend'.

P223 L6-11 As another referee may have already commented, I was a little unsure as to how the confidence intervals were derived. There appeared to be a contradiction ('outer band, 3.6% of the measured pMC. This CI represents the 3.1% CV above'). To calculate confidence intervals, one requires the standard error of the mean (SEM) and the appropriate Student's t-value. I was a little unsure as to whether one single SEM had been calculated for the total 45 data (3 treatments x 3 depths x 5 field replicates) in Table 2, or whether some kind of 'average' SEM had been calculated based on individual SEMs for the 9 treatments (3 treatments x 3 depths). Please could the authors clarify this?

P224 L 26 Ellert et al. (2006) reference should use upper case for 13C, 14C and 15N.

P228 Table 2 caption Please state that 'sigma' is the standard deviation (assuming that it was it is).

P230 Figure 2 I recommend that the y-axis (MRT) goes up to 4500 years to show the full deviation at 70 pMC.

Interactive comment on SOIL Discuss., 2, 217, 2015.