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Interactive comment on “Nitrogen fertilization did not affect decay of old lignin and SOC in a ¹³C-labeled arable soil over 36 years” by A. Hofmann et al.

Anonymous Referee #2

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This is a generally nice work, taking advantage of long-term field trials and the C3-C4 crop change for isotopically allocate the fate of SOC and lignin during decomposition in soil.

The authors are right in pointing out that N deposition might generally affect the amount of available N in the system. However, most of the N entering soil is soon incorporated into microbial biomass. To interpret the data obtained I suggest to provide much more data on the amount of N fertilization over time as well as the changes that might have occurred in the amount of N atmospheric input. Most probably the SOC contents will have changed during the experiment. This will most probably also change the amount

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of available N in the soil, leaching of N etc. Thus much more information on the N are necessary to better interpret the data. The discussion switches between decomposition of total SOC and lignin. This should be clearly differentiated. The effect of N on decomposition of lignin may be adverse to the effect on total SOC. Lignin is quantitatively only a minor component of the plant residues. Did the authors consider priming effects, which might be different in the different N fertilization treatment.

Interactive comment on Biogeosciences Discuss., 6, 1657, 2009.

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