

## ***Interactive comment on “Dynamics of microbial communities during decomposition of litter from pioneering plants in initial soil ecosystems” by J. Esperschütz et al.***

**Anonymous Referee #1**

Received and published: 22 December 2012

This is an interesting paper on the effects of litter decomposition on the underlying soil. Its focus on a postmining site makes it highly relevant since this environment is usually poor in nutrients and any external input has a great impact. Furthermore, the labelling with  $^{13}\text{C}$  is a very suitable method to assess the changes in the soil microbiota deriving its biomass from the substrate. Also, while we have a good understanding of litter decomposition, the effects of litter decomposition on the soil microbial community via substrate leaching is much less known. Overall, I find the paper well done and although the English would benefit from improvements, the presentation of results is on a good level. I find only two major points where the authors in my opinion should spend more time:

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1) there should be a comment on the litter decomposition in the course of the experiments. In *Calamagrostis*, it seems that it was very low in the beginning, than fast between weeks 4 and 15 and later none or very low. Also with *Lotus*, the decomposition between week 15 and 30 seems to be close to zero. What is the reason for that?

2) I am not sure what is the source of the observation of high levels of the FA 18:3 and 18:2w6,9 in the initial phases of decomposition. Both of these FA are common in many litter types and the authors should clearly show what is their content in their litters. At best, the PLFA signature of the litter should be added. Although the authors claim that there is little litter material mixing into soil, the FA can perhaps leach from the litter. The best would be to demonstrate if this can occur.

Minor comments:

Abstract L12: delete "bulk" Abstract L13: delete "process" 14985 L5: change "closed" to "close" 14988 L6: "the soil moisture (0-5 cm)" - rephrase, the meaning is unclear 14992 L6: in Fig. 2, the interpolation of the litter decomposition data fits poorly, in fact, there is almost zero decomposition between weeks 15 and 30; please connect means with straight lines 14992 L9: I can not see the data from week 10, so you can not speak about rates before / after week 10. 14992 L18: Include zero line in Fig. 3 or consider its transformation into log-scale 14993 L9: There is high microbial biomass but low litter mass loss; can it be distinguished if the microbial biomass comes mainly on expense of the litter leachate or is there some contribution of the priming effect of the leachate? 14994 L19: rephrase, the amount of applied litter can not change 14995 L12-L13: unclear, rephrase 14995 L25-L26: how much water soluble material was there in your litter 14997 L25: explain what does "sustainable" mean here Fig 3. Caption: delete "were" after "are"

Interactive comment on Biogeosciences Discuss., 9, 14981, 2012.

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