

Solid Earth_Review process

Se-2014-100

General comments

The manuscript “Impact of the addition of different plant residues on carbon-nitrogen content and nitrogen mineralization-immobilization turnover in a soil incubated under laboratory conditions” analyzes the effects of different plant residues on N-dynamics in soil and its possible consequences on crop yield. The information obtained with this study is highly valuable, but the experimental design could have been improved, since all plant residues were added to the same soil complex sample and previous crop history of the soil had not been taken into account. Plant residues quantity and quality can condition soil microbial community composition. Soil microbial functional capacity to degrade or consume more efficiently plant material which had been previously present in this soil should be considered in the interpretation of the results and conclusions. Soil microbial community composition could be highly different between *Zea mays* and *Trifolium repens* soil samples, so the origin of soil samples is important.

Specific comments

Material and methods

Pag 3055, lines 23-24: Data of soil analyses should be on result section.

Pag 3056. Lines 1-5: the plant species names should be named the first time in the material and methods with the full name, that means: *Zea mays* L. instead *Z.mays*. I suggest making a diagram summarizing different experimental treatments and abbreviations that will be use for each one.

Result and Discussion

Pag 3058, lines 1-20: I think that authors should summarize this part, since data are exposed in the table and focus more thoroughly this section in the origin of the differences in plant residues quality.

Pag 3059, section 3.2 Nitrogen mineralization. Similar to previous paragraph, the enumeration of the results is hard to follow, due to the lack of a clear standpoint of the results. Considering mineralization data are showed in table 2, I think that result should enumerate or comment following always the same order and perspective. For example, compare mineralization result depending

on plant component (root, leaves, etc) or the type of plant species (leguminous/non-leguminous).

Pag 3059-3060: Section 3.3. Net cumulative mineralization.

I'm a bit worried about this estimation. I've consult Sistani et al.,2008 manuscript where "Cumulative litter-derived inorganic N for each soil was calculated by subtracting the inorganic N of the-un-amended control and initial litter inorganic N content from amended soils at each sampling time" and I think that this estimation could result too simple and could lead to get confused conclusions. The author should take into account N-Biomass which reflects would reflects part of N from plant residues degradation and is probably related to NCMN negative data. In addition, the fact to consider that inorganic-N from soil-organic N will be the same in the **control sample** that in the **samples amended with litter** is in my opinion uncertain, since microbial activity (C and N mineralization) will be different when fresh organic matter is added to the soil, even soil microbial population stimulated could be different at each treatment. I understand that this estimation gives us an idea of N-dynamic, but in my opinion authors should explain better the calculation and the meaning of this data.

Conclusions

Pag 3064-3065: Please simplify the conclusions focusing on the most relevant information related to the objective of the work, trying to avoid the repetition of the result enumeration.

Figures and tables

Figure 3. Caption: check caption of 3.a