

Interactive comment on “Fine root dynamics for forests on contrasting soils in the colombian Amazon” by E. M. Jiménez et al.

E. M. Jiménez et al.

eliana_jimenez@yahoo.com

Received and published: 9 July 2009

Answer to Interactive comment by S. Vasconcelos (Referee) steel@cpatu.embrapa.br
Received and published: 31 May 2009

Specific comments:

SV.- Why do you report your results in terms of carbon in the abstract only? This is not consistent throughout text.

We will modify this on the paper.

SV.- Introduction should be shortened.

We are preparing a new manuscript with the introduction and methods thoroughly re-

C1108

viewed.

SV.- Page 3417, line 29 – Substitute for “This study evaluates: : :”

We will modify this too.

SV.- In the material and methods section, authors should explain the reason for using different core volume and sampling interval.

Yes, we added an explanation for that, as we mentioned above, we are reviewing the methods. Because the differences in sampling strategy between sites responded mainly to logistic/funding limitations of the research in each site. Each experiment started as an independent piece of research, aimed to estimate productivity in each forest type. The experiments were afterwards integrated into the current analysis when the importance of the comparison was acknowledged. Even though sampling strategy was not identical, sampling differences are not substantial: sample sizes were almost identical in both sites (22 vs. 26 in the establishment 2, and 13 vs. 13 in the establishment 3 in the forest on clay soil and white sands, respectively). Though differences in retrieval times in the establishment 2 could be considered substantial (0.52 and 0.77 years, respectively), samples were retrieved at almost identical times in the establishment 3 (0.82 and 0.81 years, respectively). Because of the potential artifacts introduced by differences in retrieval times, we also calculated the relative growth rate (RGR) to compare FRP in standard units between forests and time intervals; results of RGR were consistent with the FRP results. However, as also pointed out, the two methods show the same results despite this limitation of different core volume: FRP is higher in white sands than in clay soil, and differences were consistent along all the monitoring time.

SV.- Page 3419, line 10 – Terra firme (mature?) forest

Yes, they are two mature forests. We will add this.

SV.- Page 3422, line 4 – What do you mean by groups? You should consider using a

C1109

repeated measure analysis to test for date effects on root production and mass.

We didn't use this, because as we explained in the section of methods, we divided each 1-ha plot in 13 or 14 sampling areas, located approximately 40 m apart of each other. This means that every sampling area had about 700-750 m² of area and then, subsequent samplings were randomly done in each of these sampling areas. We assumed such distribution is mainly random and then samples are independent, for this reason we did not check for spatial independence of fine root distribution, and each collection date was considered as a group (data of fine roots collected by plot per date). For this reason we did not see the necessity of using the repeated-measures ANOVA.

SV.- The authors should clarify why they did not test the correlation between FRP and rainfall.

The idea was to evaluate if the temporal variation of FRM observed was related with the rainfall, in this case the FRM data made possible to do it, but not the with the FRP data, calculated just for two years.

SV.- The authors associate the lower FRM and FRP with higher nutrient concentration in clayey soil sites. However, these forest sites also show high Al concentration and saturation compared to the white-sand soil site. Is it possible that Al toxicity play a role in constraining root production in the clayey soil forests?

We associate the differences between the fine roots carbon allocation in these forests to soils resources: it means water and nutrients, because is very difficult to separate it. And our data suggests that both, water and nutrients, play a role in the carbon allocation to fine roots, but we can't conclude which nutrient or characteristic play a particular role. Aragão et al. (in this issue), showed an analysis in this sense.

SV.- The association between FRM and soil water logging (page 3432, 1st paragraph) should be made with caution because there is not available data to support it. Or have you measured soil water status?

C1110

We suggested that can be explained for this, for the pattern in the temporal variation of FRM observed and also for the correlation with the rainfall.

SV.- The difference between FRM (in Mg ha⁻¹) and FRP (Mg ha⁻¹ yr⁻¹) should be clear throughout the text and figures. For example, in page 3433, lines 5-11, the authors present FRP values but refer to FRM. The authors also say (lines 6-7) that the ingrowth core method has been used to estimate FRM. Is that correct?

Yes, it will be changed, there is a mistake; it isn't 5.00 Mg ha⁻¹ yr⁻¹, is 5.00 Mg ha⁻¹. And the ingrowth method permit obtained values of the stocks of the FRM for every sampling time and it is possible to observe in the Fig. 3. where the accumulated fine root mass is showed.

SV.- Page 3434, line 5 – The sentence starting with “ However, : : :” is not clear. It should be revised.

It will be.

SV.- Table 2 – Why do you present results in carbon unities?

As we mentioned before we will check for the units of Carbon.

SV.- Table 3 – Are the maximum and minimum values statistically different?

Yes, there are differences in the maximum and minimum values of each year considered, in the Fig. 5. it is showed, different letters in each plot show significant differences ($p < 0.05$) of fine root mass (0–20 cm) between collection dates.

We will send the list of changes in the manuscript including the Technical corrections.

Interactive comment on Biogeosciences Discuss., 6, 3415, 2009.

C1111