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Biogeosciences Discussions

Interactive comment on "Decreased summer drought affects plant productivity and soil carbon dynamics in Mediterranean woodland" *by* M. F. Cotrufo et al.

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We are very pleased that the reviewer considered our work worthy of publication, and appreciated the rational behind the experiment and the important novel finding and approach.

A side from the positive overall comment, the referee's had a few very relevant queries, and we provide below a punctual response.

Drains' impact: This is a very relevant remark. Indeed, we were aware of this problem and have been very careful at positioning our replicate soil collars for respiration measurements and soil climate sensors fully at random, to avoid bias due to position. Also

drains were periodically cleaned off litter and litter redistributed underneath the drains. We now specify this in the text.

Root C input: The referee is absolutely right and it would have been great at the site to have a reliable estimate of root growth and turnover under the different water treatments. However, we are all aware of how difficult that is, and that a one-time sampling of root mass, without previous data, is surely not enough to get meaningful results about treatment effects on root dynamics. Unfortunately, the availability of C4 soil and other resources was limited and we could not install more cores for an accurate assessment of roots. Indeed, we could have measured the root mass in the sampled cores, but unfortunately at the time of sampling we had not thought about it and the root mass was discarded, with only a subsample retained for chemical analyses. A peaty! And we are sorry for this, but we do not have the root data to show.

Modeling of CO2 flux: We are very thankful to the referee for having provided this advice. Indeed, the modeling of soil respiration did not add much to the paper, which is already plenty of interesting results. Thus we accepted the suggestion and deleted this part. We now use modeled data only for gap –filling. As a result, we deleted fig.7 and the respective section in the results (P13L27-P14L6).

Detailed comments:

5959,14: We now specify that we measure “total soil respiration”

5960,2: Done

5960, 22-25: The referee is right. In this case, with target we meant the average 755 mm yearly water addition by irrigation. Because it is not necessary and to avoid confusion we deleted “the target was not reached”.

5960, 26: Corrected.

5962, 21: Corrected

BGD

8, C2383–C2386, 2011

Interactive Comment

5964, 24: Done

5966,6: Since we already specify “summer months”, “JAS” was superfluous and we deleted it.

5966-, 8: Corrected

5968, 6-12: Following the referee’s suggestion soil respiration modeling is not any more discussed in the paper, therefore this section and fig.7 was removed.

5969, 5-5970,7: We appreciate this suggestion, and see the referee’s point. However our findings are somewhat complicated to report and the current opening of the discussion introduces each of the points later discussed. We agree that it is generally nice to have a strong, attractive opening of the discussion, but when we attempted it we felt like duplicating the “conclusion” section. For these reasons we left our discussion unaltered. We are certainly open to revisit this decision if the editor requires us to do so.

5970, 19: The paragraph was modified and now reads: “At each plot, six PVC collars (8 cm height and 15 cm diameter) were installed randomly in the middle of the plot at around 1.5 m from each other, in order to avoid confounding border and drain effects.”

5970, 28: The referee is correct. Thus, we modified the text that now reads: “In 2008 and 2009, mean annual leaf litter production was consistently less in the dry plots as compared to wet and control plots (Table 3). However, due to the high spatial variability, the difference was not significant. Across all three treatments, differences in mean leaf litter fall among treatments were highly correlated with differences in annual water input, with an additional 10% leaf litter fall every additional 100 mm of rainfall a year (Fig.3).”

5971, 1-3: We are sorry, but did not understand what the referee means here.

5971, 29-5972: We were here making a general reference to the range of soil moisture, where respiration is controlled by moisture, and not referring to the specific shape of

BGD

8, C2383–C2386, 2011

Interactive Comment

correlation in our study. To avoid confusion, we replaced “linearly” with “highly”.

5972,14: Thank you for spotting this. The reference is now included in the reference list. Fig.5: As suggested by the referee we have now eliminated the presentation and discussion of model results. However, we use modeled value to fill the gaps in measured data, and thus we feel we still need to show the model performance on this figure. As a result of using measured gap-filled data, rather than modeling to estimate cumulative soil respiration, values have now slightly changed, and the corrected data are now reported in fig. 6 and throughout the text. Again, changes were really minor and did not affect any of the conclusions.

Interactive comment on Biogeosciences Discuss., 8, 5955, 2011.