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

Anonymous Referee #2

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This is a very interesting paper discussing the effects of throughfall reductions and additional water inputs on a Mediterranean woodland. The work measures a number of parameters in the forest C cycle. Remarkable is the increase in new soil C after irrigation in one year. In the C4 soil cores that only measure belowground inputs of C, to a depth of 30cm, the increase of the irrigations treatment compared to the control is ca 300 gm⁻². As the authors state this could be derived from fine root turnover and root exudation. Sadly no values for fine root biomass are given, even though the material and methods report that the fine roots were carefully removed. However, there is also no mention of any mycorrhizal contribution although the main tree species at the site, *Arbutus*, is known to be highly mycorrhizal. An increase of 300 gm⁻² equates to 7000

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kg ha⁻¹ biomass of fine roots with a turnover rates of 1, assuming all root biomass is turned into soil C, which is unlikely. This suggests that fine roots must have a very high turnover, or other C sources must be involved. Root exudation is not sufficient to be the missing source. However, even without measurement, an increase of say 3000-7000 kg ha⁻¹ fine roots in the root cores must have been visible. I am aware that this may be a 'root nerd's' comment to a very interesting paper, but seeing that in my opinion the most remarkable finding is the increase in soil C after irrigation, some sort of cross verification would greatly improve the paper.

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

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