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Interactive comment on "Effect of land management on soil properties in flood irrigated citrus orchards in Eastern Spain" *by* A. Morugán-Coronado et al.

Anonymous Referee #2

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General comments The study makes a comparison between 3 different agricultural regimes practiced in flood irrigated citrus orchards in Eastern Spain, with the aim of assessing the effects of these different regimes on the soil properties, I think this aim has broadly been achieved. However, the paper is presently deficient in several areas and as such I would recommend several substantial changes prior to acceptance, these are listed below. Introduction The introduction doesn't talk about soil properties and how these are thought to be influenced by the land management they are subjected to, it talks extensively about the effects SOM has on the microbial activity that takes place in the soil; this should be condensed to allow the inclusion of more detail on the soil

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properties. The paper would benefit from the inclusion of clear hypotheses, currently the aim is stated at the end of the introduction, hypotheses could be added here to give the paper more structure. Methods The sections on experimental design and soil sampling are somewhat contradictory making it unclear as to whether samples were collected from experimental plots all located on one farm (as suggested in lines 16 and 17 on page 5) or if they were collected from 3 different farms (as stated in lines 12 and 13 on page 6), this needs to be clarified. Clarification is also needed as to whether the 3 different management types are subject to the same irrigation regime or do they vary according to decisions made by the farmer (lines 23 and 24, page 5). Results Page 9 begins with the statement "The H plot did not show a great improvement in the fertility parameters". Improvement is the wrong word here, samples were only taken and tested once, there is no change to measure as no data about the soil properties is reported from before the imposition of the management regime. This sentence should be changed to remove the word improvement Section 3.3 reports the bivariate correlation coefficients calculated for "the most important physicochemical and biochemical properties" – how was importance decided, why not just include all variables measured? The separation of management practices on PC1 and PC2 is very clear; however the separation on PC1 and PC3 is less obvious. PC3 seems to separate the organically managed samples into two distinct groups, is there any reason for this? Why would urease activity be different in these two groups of samples? In order to make these differences statistically clear anovas should be carried out using PCs 1,2 and 3. Increase the font size for the axes legends to make them easier to read The PCA bi-plots are of poor quality, they are almost illegible at 100% and are only useful when blown up to about 250% . This needs to be improved, make the plots bigger and increase the size of the font for the loadings labels as well as for the axes legends. Discussion Generally discussion of the difference in soil properties between different agricultural management types is lacking. The differences are acknowledged but there are few reasons offered for these. Lines 23 and 24 on page 11 talk about hypotheses being supported by the results obtained, however, as stated above, no hypotheses have been clearly

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stated. Lines 12 – 14 on page 12 state that the soil managed organically is able to process labile organic components and protect stable organic fractions because it has been shown to have high soil organic matter, this is not a justified conclusion. The organically managed soil is the only one of the 3 that has substantial regular inputs of organic matter (the mulch added in January), the other two soils are specifically managed so as to keep weeds to a minimum meaning that there is little litter feeding into the system. This means that simply measuring the levels of SOM in each soil does not provide sufficient evidence to show that the soil under organic management is more capable of protecting stable organic matter fractions than either of the other two.

Minor comments Line 24 page 2: should read on soil microbial instead of “in microbial soil” Line 5 page 3: change agriculture to agricultural Line 14 page 3: change time to temporally Line 21 page 4: think chemical farmers should be changed to something like conventional farmers Line 12 page 10: enzymes not enzimes

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Interactive comment on SOIL Discuss., 2, 1, 2015.