

## ***Interactive comment on “Are biodiversity indices of spontaneous grass covers in olive orchards good indicators of soil degradation?” by E. V. Taguas et al.***

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### GENERAL COMMENTS:

1. REFEREE: Present paper intends to cover important issue about indicators choice and integration. The idea is current, regardless of the fact that a lot of work has been done, especially in biodiversity indicators choice, development, validation etc. followed with common assessment with soil properties – since site specific conditions prevent establishment of uniform indicators set. Starting from the valid intention in the title, later on through the manuscript this path is lost and without significant corrections

C183

study should not be accepted for the publication in SOIL journal. As an main issue, the terminology should be harmonized through the text, thus to decide eater to deal with spontaneous cover, cover crops, weeds or some other term (i.e. native plants).

AUTHORS: Dear Referee, Thank you for the time you devoted to reviewing this manuscript and for your helpful comments. We have taken all your remarks and suggestions into account to improve our manuscript. We are particularly grateful for your effort to improve the readability of the manuscript.

Following your advice, we have changed the title, the introduction, the structure of material and methods, discussion and the tables and figures. In addition, we have harmonized the terminology in the text and have decided to use the term “spontaneous grass cover”.

### SPECIFIC COMMENTS:

Introduction 2. REFEREE: Structure of the Introduction part should be changed completely, it is not in the line with study title, objectives and abstract. Starting from definition of soil biodiversity – it is not appropriate, and additional references are needed for the first paragraph. (Some suggestions - Journal of Geographical Sciences, 12(2): 243-252; Ecological Indicators, 9(3): 432-444; Geoderma, 147(3–4):159-171; Trends in Ecology & Evolution, 18(4): 182-188; Agriculture, Ecosystems & Environment, 98(1–3): 1-16)

There is a missing link between first and second paragraph and later on to EU strategies. List of the EU strategies is not appropriate at all and should not be included, maybe only as indication with further reference. Otherwise it can be starting point and pillar on which you can build your introduction. Although, following paragraph about indicators use and one about olive cultivation and associated soil degradation are ones that finally fit with studies objectives and justifies them.

AUTHORS: Thank you for the references. We have added these works and we have

C184

adapted the content to the new title and the objectives of the work. We have removed the irrelevant information and the inappropriate references.

3. REFEREE: Page 236; Lines 5-10 – missing reference or references. AUTHORS: The reference was FAO (2014); however, we have removed this paragraph, following your recommendation.

4. REFEREE: Page 236; Line 12 – Reference Mimee at al., 2014 is not one that main objective is yield improvement. AUTHORS: We agree with the reviewer that including this reference is not directly to the point: we were citing different examples. We have therefore decided remove it, following the reviewer's comment.

5. REFEREE: Page 237; Lines 7-25 – Under investigation is spontaneous grass cover and this is something that need further discussion, as advantages and disadvantages, without going to wide and again without clear terminology. AUTHORS: We have changed the text (and removed some parts) to focus exclusively on spontaneous grass cover.

6. REFEREE: Page 237; Line 24 – After improvement, etc. there is a need for reference. AUTHORS: This sentence has been written by the authors of the manuscript, and so there is no reference.

7. REFEREE: Page 238; Line 6 – Specific objective No. 2 should be modified; instead of meteorology to write meteorological conditions. AUTHORS: We have corrected this.

8. REFEREE: Materials and Methods – I would like to suggest change of abbreviation in the case of study site "Conchuela". Con is often used in the studies as abbreviation for Conventional agriculture, thus it may be better to use CN (two letters as in the case of other study site - PG). Since description of the study sites is quite long, it may be better to insert one table for both with main characteristics as drainage area, mean elevation, annual precipitation, soil type etc. Like this it will be more clear ease to compare them. Additional important characteristics could be given after the table.

C185

AUTHORS: We have changed this abbreviation and we have included the table as suggested (Table 1).

9. REFEREE: Page 240; Line 1 –Again terminology disparity: subtitle states Weed sampling – that does not mean the same as native or spontaneous cover. Same path should be applied through the text. AUTHORS: We have clarified that we mean "grass spontaneous cover".

10. REFEREE: In the Figure 2 indications on the pictures a, b, c etc. do not correspond to the legend below the figure. AUTHORS: Our apologies, we have corrected this.

11. REFEREE: Title 2.3 should be changed, Data analysis most of the time refers to the statistical data analysis, thus it can be placed at the end of M&M section (since statistics is almost missing in the manuscript). AUTHORS: This title (2.3) has been modified and we have included the new title 2.3.4. to describe the statistical analysis carried out (see also Tables 4-6 and 8 and 9 and Fig. 3). ,We would therefore prefer to keep the current title.

12. REFEREE: Page 240; Line 19 – Explanation of the Richness (R) is not clear and how the values are obtained. AUTHORS: We have clarified this. Firstly, at each sample point of the grid (Fig. 1 and Fig 2a and 2b), the number of species present were identified with pictures and plant material. Then we calculated the total number of species in each catchment (on the seasonal and annual scale).

13. REFEREE: Page 241; Line 2 – In the description of the Sorensen's index (Is) formula, for C – instead of present should be written common both study sites; This is correct in the case of Sorensen's index (Is). (Why here use of the term farms? Make it uniform through the manuscript) AUTHORS: Following your advice, we have corrected this.

14. REFEREE: Page 242; Line 3 – Climatology is not something annual; change it to the meteorological data. AUTHORS: We have corrected this.

C186

15. REFEREE: Page 242; Lines 13-15 – It should be deleted, does not belong to the part of materials and methods. AUTHORS: We consider that these sentences help to show the procedure we applied; therefore, we would like to keep them.

16. REFEREE: Page 242; Lines 18-25 – This paragraph needs structural changes, authors started with methodology for Organic matter, then about number of samples and way of sampling. It should be opposite, followed by Bulk density. It is not clear why number of samples is different in two study sites. And the last sentence should be part of statistical analysis, not soil indicators. Part about statistical analysis should be added and additional analyses are desirable. AUTHORS: We have changed the paragraph following your suggestion. The number of samples is different due to the different tree distribution allowing different intensities of sampling. We have included a new title where we have explained all the statistical treatments applied (title 2.3.4). If you have any specific suggestion for this, we would be grateful if you could let us know.

17. REFEREE: Results – Number of the Tables is too high. Some of them could be joined and some moved in Supplementary material. AUTHORS: We have followed the reviewer's instructions about new Table 1 and we have removed Table 4 because its information was included in old Table 3. In addition, we have substituted Table 5 for new Figure 3.

18. REFEREE: Table 2 – Use of the word Example in the Table title is not appropriate, change it with Some or just delete it. In the case of % of clay, sand etc. particles name should go in the first line and then below unit (as in the case of organic matter). AUTHORS: We have included both changes.

19. REFEREE: Table 3 – In the table body Richness should be with abbreviation, as decided in the part of M&M. AUTHORS: Thank you. We have done this.

20. REFEREE: Table 3 and Table 4 should be joined and authors need to clarify why just in the case of Sorensen's index they showed seasonal data, while this is not case for others? AUTHORS: We have joined the tables together (see new Table 4). The

C187

analysis is a direct one through Is because we only wanted to compare the degree of similarity of the species composition in the catchments. As for the other indicators, we considered that it would be more useful to carry out the analysis on an annual scale.

21. REFEREE: Table 5 – Frequency is clear even from the n value and there is no need to give same data twice. It will be better to present biological spectrum (life forms) either as n either as Frequency in the form of Figure. In the case of PG sum of the Frequency values is not 100. AUTHORS: Our apologies, we have replaced this table with new Figure 3.

22. REFEREE: Table 6 – Needs to be moved in the Supplementary material. To be kept within results it could be appropriate in some journal with major scope in botany. AUTHORS: We would like to keep this table because it might be useful for the reader. What this table does is to allow us to complete the information of biodiversity indices because all the species can be checked (see also final paragraph of the discussion section).

23. REFEREE: Table 8 –It should be deleted, since it gives data already presented: In the case of biodiversity indices in Table 3 and in the case of soil properties in AU-THORS: As regards this Table, it may be that the reviewer did not notice the t-test results for independent samples applied to evaluate the OM and BD differences. We have improved the organization of the manuscript to clarify this point (see also title 2.3.4).

24. REFEREE: Figure 3. Which is the purpose of column Stat.? Mean and SD should be followed with some kind of Statistical analysis (one way ANOVA could be very informative). And in general part of the statistical analysis should be revised in the Manuscript as a whole. AUTHORS: Please see answer 23. In addition, the statistics of the figure allow us to observe the histograms and to compare the quartiles of the attributes evaluated.

25. REFEREE: Figure 3 – Number of the samples is given in Materials and Methods,

C188

why to write it again and if to keep why after each parameter (it could be better just on the end). AUTHORS: Following your suggestion, we have modified the figure caption.

26. REFEREE: Page 244; Lines 1-3 – There is missing reference for the statement and this part could go in Discussion part. AUTHORS: We have included the following reference: Guzmán G and Foraster L.: Manejo de la cubierta vegetal en el olivar ecológico en Andalucía: siembra de leguminosas entre calles. Consejería de Agricultura y Pesca, Junta de Andalucía, pp 78, 2007.

27. REFEREE: Page 244; Line 18 – How to say that difference in OM and BD between study sites were significant if Statistical analysis to confirm this is not presented? AUTHORS: The values of significance were included in old Table 8 (t-test was explained in chapter 2.3.). Nevertheless, we have improved this point with the new title 2.3.4. (see also comments 23 and 24).

28. REFEREE: Discussion – Text should be revised for the terminology used and enriched with some more current studies. As well adjusted to the changes in paper suggested above. AUTHORS: We have improved the discussion with the references mentioned by the referee and with others (Magurran, 2004; Mesto et al., 2007; Guzmán and Foraster, 2007).

29. REFEREE: Conclusion – Page 247; Lines 11-17 – This parte belong to the discussion. AUTHORS: We would prefer to keep these sentences, because they complete the explanation of lines 7-10.

30. REFEREE: TECHNICAL COMMENTS Page 236; Line 17 – Instead of dedicated to growing olives change to dedicated for olives cultivation. Line 21 – Southernmost instead of Southern most. Line 25 – Change have difficulty growing to have difficulties to grow. Page 237; Line 9 – Authors could think to use some other word then traffic – i. e. passage (same for page 239; Line 5). Line 24 – our while should be deleted. Page 238; Line 6 – Change meteorology to meteorological conditions. Line 23 – for FAO classification indicate the reference (Same for Page 239 – Line 18). Page 240;

C189

Line 8 – Between trees and away you should add comma. Page 241; line 11 – Double the present in the line, one to be deleted

AUTHORS: Thank you very much for your corrections. All have been included in the manuscript.

Please also note the supplement to this comment:

<http://www.soil-discuss.net/2/C183/2015/soild-2-C183-2015-supplement.pdf>

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Interactive comment on SOIL Discuss., 2, 233, 2015.

C190