

Interactive comment on “Soil physical quality changes under different management systems after 10 years in Argentinian Humid Pampa” by J. L. Costa et al.

Anonymous Referee #2

Received and published: 2 September 2014

The study compares the effect of different tillage system on soil physical properties along 10 years. In general, the study is well conducted and provide good results-conclusion to be applied on soil management with local interest. However, it could be improved before the publication on S&E.

Introduction I could not see a clear proposal distinction on this manuscript compared to others cited on the introduction and discussion. What it is the novelty or innovation of the manuscript?

Material and Methods Explain the experimental procedure: The CMWD increased between 2004 and 2007 as the management system became more intensive (MP >CP>

C855

NT). Won't be the change on physical properties assessed for 10 years. I did not see clearly the initial conditions of the experiment. I was expecting to see the change of the soil through the time (i.e., 10 years). Keep just MWD instead of CMWD. In addition, authors could explain briefly the methodology applied to assesses this parameter (see reference). For example, the soil is richer on sand. It was sand corrected from the final MWD. Equation 1. Why it was used 2.65 on particle density. Is it reliable for this soil? Statistical analyses. Provide the name of the statistical test and not the statistical package. Also, what was the post-hoc test to compare average (Dunnet - to compare the initial conditions - control) or Tukey. Please separated the results from the discussion. The text is so heavy that became difficult to follow the discussion. 3.2 Replace Structural stability to Mean Weight Diameter. Since the first, involve other parameters. p. 2624 l. 20. Overall, structural stability is usually associated with the increase in the SOC content (Tisdall and Oades, 1982)... Should the authors take carefully on this argument, because we have different OC phase on the soil, different turnover ratio. And, micro and macro aggregate have different behavior according to type of organic matter, clay, oxide etc. It is a general statement. . . . Also the gramineous crops (wheat and corn), especially, roots could be more important to macro aggregate stability than stubble over the ground. For rainplash, it is ok. 3.3 Near-saturated hydraulic conductivity (K(h)). Such a long experiment could have different soil moisture conditions during soil infiltration measurement. How the authors deal with it? Table 3 the authors use R for radius and in the text is used r. Keep the same. (Álvarez, Steinbach, 2009) and (Álvarez and Steinbach, 2009) keep a consistent form throughout the text.

Conclusions (ii) the CMWD values showed a decrease in the structural stability of the soil due to the agricultural activities. The CMWD increased more between 2004 and 2007 as the management system became intensive (MP>CP >NT)... Should not the MWD suffered a decrease? All the crop system displayed a MWD bigger than 2004. And conventional was equal to NT..

See a paper than can help on this discussion and methodology to MWD as well. Castro

C856

Filho C, Lourenço A, de F. Guimarães M, Fonseca ICB. 2002. Aggregate stability under different soil management systems in a red latosol in the state of Parana, Brazil. *Soil and Tillage Research*, 65: 45-51. DOI: 10.1016/s0167-1987(01)00275-6.

Table 1. Initial soil characteristics of the experiments. Where is the other soil characteristics such as infiltration, bulk density, MWD.....? Table 1 displays different units Replace: P (ppm) to mg or g / kg-1, Texture% to kg kg-1, Soil carbon stock will not be better in kg kg-1 and related to soil bulk density. Bulk density affect directly the soil carbon content. Table 2. Maximum soil density (ρ_{bmax}) Mg m⁻¹ or Mg m⁻³? Different letters meaning significantly different. It is obvious, just in case, replace to Different letters in the columns meaning significantly different. Also, all the data should be followed by standard deviation etc.. Table 3. Effective porosity calculated... No statistical comparison was done on these parameters. Avoid to use * as a note in order to not cause confusion with * ($p < 0.05$) Figure 1. Experiment geographic location. Definitely, figure 1 is awful.

Interactive comment on Solid Earth Discuss., 6, 2615, 2014.