Review of paper "Remediation of degraded arable steppe soils in Moldova using vetch as green manure" by Dr. Noelia Garcia-Franco.

I have reviewed the manuscript "Remediation of degraded arable steppe soils in Moldova using vetch as green manure" submitted to Soil Earth. This study compares the effect on different soil properties, crop biomass, main crop yields and SOC stocks in two experimental Chernozems soils, which were intensively used for agricultural production for several decades after theses were sown with a mixture of hairy vetch and cereal. The paper is well written and shows some very interesting results of remediation of degradable arable steppe soils in Moldova. I felt that the set of measurements was very well thought out and executed, and the authors have a wealth of information to work with.

In conclusion, I believe that this study provides valuable insights about the effectiveness and benefits of vetch using as green manure on several ecosystem services such as improvement of soil structure, water erosion control, carbon sequestration, greenhouse gas mitigation and crop yield. In fact, the restoration of these degraded arable steppe soils in Moldova should be one of the major challenge faced by scientists because results in this dry continental areas may be a reference for extrapolation to other dry areas.

Could be interesting the study of the effect of green manure using vetch on the different functional organic carbon pools (active = labile, slow, passive pool). I think it will be possible in the future because the knowledge acquired in this area could be very useful for the implantation of the best management practice with the aim of soil conservation and mitigation of climate change in Chernozems of dry areas. You have a good experimental site.

Other minor comments:

- Pp. 512. Lin. 11-15. You emphasize the importance and advantageous of mixtures of hairy vetch and winter wheat than legume monocultures…It is the same in Pp.516, lin.25: “Remarkably, studies which applied mixtures of hairy vetch and cereals as in our study…”but then in the manuscript you always use hairy vetch only but your treatments was 80% hairy vetch and 20% winter wheat. In my opinion if you only say: “hairy vetch” emphasize of the importance of use mixtures in these soils disappears. I prefer “mixture of vetch and wheat” or “green manure” or use acronym: HVC = hairy vetch and cereal or HVW (hairy vetch and wheat).

- Pp. 513. Lin.11-12: “hairy vetch was incorporated into the soil using a disk harrow” (until which depth: topsoil, 15 cm….? Or until what horizon: Ahp1, Ahp2….?). I think it is important to say. In other similar studies with tillage (mainly reduced or minimum tillage) and green manure, the tillage is necessary because it favours the incorporation of plant material into deeper layers, promoting the formation of new aggregates with a high OC content in these layers, while no tillage only results an improve in topsoil.

- Pp 513. In material and methods you did not anything about different depth intervals (from 0-12, 12-20, 20-35, 35-47 cm) or about horizon intervals (Ahp1, Ahp2, Ahp3, Ah).

- Pp. 513. What is the duration of the experiment? One years, two years? When soil samples were taken…in 2011, 2012, 2013, every years? It is not clear in the text.

- Pp. 513. Lin17-18. … "Adjacent control plots" has the same soil type? What is the main crops?

- Pp.513. Lin 25. Why did you choose dry sieving? Why not wet sieving?

- Pp. 514. "…Calculated on the basis of an equivalent soil mass…" I agree. I think is necessary.

- Pp.514.Lin. 17-18. You determined root biomass…but I did not see the results about this parameter in a table or figure.

- Pp. 515. Lin. 9-11. "…In Orhei, the yield of sunflower significantly increased (P <0.05)…similarly, corn yields significantly increased (P< 0.05)…." But why you didn't use different letters in bars of the figure2? Why in the figure 2 is not written P < 0.05 in the end of Figure caption? I think these above mentioned are necessary to a better understanding.

- Pp.515. Lin. 2. Table 1. Is possible to include in table 1 the control plot? Do you have aboveground and belowground results from control plot? How do you know if your aboveground and belowground results in your study site (Orhei and Cahul) are high or low without the results of above- and belowground from control plot?.

- Pp. 515. Lin. 13. I think is better tell about depth or horizon interval than say "the topsoil (0-47 cm)". I addition, in table 2 are horizon with their corresponding depth (I agree. I think is better that only write horizon or depth). I think is necessary in Table 2 to write "(P <0.05) in the end of footnotes. Are there significant differences between study site, and depth in basic soil properties? In table 2 is not the control plot, is not necessary to compare changes?

- Table 3. There are depth intervals but not horizon intervals while in Figure 3 there are horizons intervals but not depth intervals. I think is necessary to homogenize. Also is better write: "(P <0.05) in the end of figure caption and footnotes.

Respect to the references:

- In the text
    1. I believe that is necessary the same trend: an increasing or a decreasing order of years of authors. Example. Pp 511. Lin.14-15: "Eitzinger et al., 2013; Supit et al., 2010 and Trnka et al, 2012" is better the most earlier

first: “Eitzinger et al., 2013; Trnka et al., 2012 and Supit et al. 2012. Please is necessary to review it in all manuscript.

2. When the authors are only two, you use both of them in the reference. Example: Tisdall and Oades, 1982, but then, in Pp 514, lin 2 you write Ellert et al., 1995 and in Pp 514, lin.5: Ellert and Bettany, 1995. The same occurs with Rochester and Peoples 2005: sometimes is with both of them and sometimes is only Rochester et al., 2005 (in text and in table 1)

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