

Interactive comment on “Integrating a mini catchment with mulching for soil water management in a sloping jujube orchard on the semiarid Loess Plateau of China” by H. C. Li et al.

Anonymous Referee #2

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Ref.: Ms. No. SED 7, 3199–3222, 2015 Integrating a mini catchment with mulching for soil water management in a sloping jujube orchard on the semiarid Loess Plateau of China

General comments: First of all, this is a really interesting study, which evaluated the effect of combined water harvesting technique with organic mulching on conserving soil moisture in orchards in the Loess Plateau of China, and it can be acceptable for publication in Solid Earth after minor revision. The water harvesting technique is "semi-circular rainwater collecting basins, also known as "fish-scale pits"" (quote from page 3201 line 16). This technique is widely used for resolving water scarcity in various

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parts of the world, but more research has been done on the effectiveness of runoff and sediment yield than soil water storage. The research integrated the water harvesting technique with two different organic materials mulching, and investigated the effects of the 4 different treatments (water harvesting with branch mulching, water harvesting with straw mulching, water harvesting with no mulching and a control treatment of no water harvesting with no mulching) on the soil profile (0–180 cm) of a non-irrigated sloping jujube orchard in the hilly region of the Loess Plateau. The results (Figure 2) indicated that average soil water storage under water harvesting with no mulching treatment increased by 4.82% (2013) and 5.34% (2014), respectively, compared to CK, and the values under water harvesting with branch mulching treatment were 14.23% and 21.81%. These indicate that the water harvesting technique itself is of weak effect on soil water storage, so that integrating it with mulching is necessary. In addition, two indexes for realistically characterizing the effect of soil water storage were used to represent the degree of soil water storage deficit and compensated. The results showed that the soil water storage under water harvesting with branch mulching was compensated through the growing season in normal years, but under CK consumed. Therefore, I think the results presented herein can give some suggestions on the sustainable development of ecological economic forest in the Loess Plateau, where suffers from one of the highest levels of soil erosion and water shortage in the world. In my opinion, this study should be able to generate interest among the general readership of the Solid Earth, so it can be accepted for publication after minor revision. However, there are some questions need to be answered and some more clarifications are necessary before publication (see specific comments).

Specific comments:

1. I would kindly suggest the authors to please revise the English as it is not easy to understand sometimes what the authors want to say.
2. Page 3200, Line 2-8: One sentence is enough for stating the principal objectives, and then describe the methods employed.

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3. Page 3202, Line 23: What's the meaning "the soil water profile", Please rewrite the sentence.
4. Please provide photos to show the fish-scale pits.
5. Page 3203, Line 20-25: Careful writing of this section is critically important because the cornerstone of the scientific method requires that your results, to be of scientific merit, must be reproducible; and, for the results to be adjudged reproducible, you must provide the basis for repetition of the experiments by others.
6. Page 3205, Line 20: WD can reflect the degree of recovery of SWS, why use another index WS? More clarification is necessary.
7. Page 3206, Line 16-19: The result was all well known, I think it can be deleted.
8. Fig. 2: Please adjust the abscissa of 2014 to make it more clearly and professional.
9. Page 3207, Line 5 and 6: why measuring soil water 3 d after rainfall at June and July, but 7 d at August? The authors should address the philosophy behind it. I am thinking that should also affect soil water redistribution. I hope authors can discuss this.
10. Page 3207, Line 14, please change "most" into "almost".
11. Page 3208, Line 8 and 9: The conclusion may be too hasty.
12. Page 3208, Line 13: Rainfall or rainfall events is more appropriate than rainfalls.
13. Page 3208, Line 21: why not describe the result of soil water deficit at September.
14. Page 3209, Line 7-10: Please rewrite the sentence.
15. Page 3208-3209, Line 23-13: The structure of this paragraph should be rearrange.

Interactive comment on Solid Earth Discuss., 7, 3199, 2015.