Solid Earth Discuss.,
doi:10.5194/se-2016-163-AC1, 2017

Solid Earth Discussions

Interactive comment on "Effects of wheat stubble on runoff, infiltration, and erosion of farmland in the Loess Plateau, China subjected to simulated rainfall" *by* Linhua Wang et al.

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Received and published: 17 January 2017

Response to SE-2016-163-RC1 Thanks for your suggestions. We are appreciate for anonymous referee #1 comments concerning our manuscript entitled "Effects of wheat stubble on runoff, infiltration, and erosion of farmland in the Loess Plateau, China subjected to simulated rainfall" (ID: SE-2016-163). We have studied comments carefully and have made correction. The main corrections in the paper according to the reviewer's comments are as follows: 1. Line 31-32: Please append some new studies in this field. Response: Line 31-32: Approximately 60% of the total watershed sediment and runoff is derived from sloped farmland due to natural and human factors, such as the precipitation intensity, geomorphology, and soil management practices, which all

contribute to farmland degradation (Keesstra et al., 2016; Liu et al., 2012; Nishigaki et al., 2017; Zhao et al., 2016; Ziadat and Taimeh, 2013).

2. Line 216: the infiltration amounts under WS were very similar, which show no significant among different slopes. Response: Line222-224: The cumulative infiltration amounts under WS were 76.11(5°), 75.95(10°), and 75.83(15°) mm with no significant difference among different slopes and 96.2%, 95.7%, and 94.8% rainfall infiltrated into soil respectively.

3. In the sector 3.3. I suggest authors to provide some insights about the performance of wheat stubble on soil loss at various slopes. The results also should be introduce in the abstract section. Response: Line 237-247: Table 1 shows the sediment concentration and total sediment loss in different treatment plots. The sediment concentration under TP ranged between 8.18 (5°) to 14.90 g L–1(15°), which was significantly higher than that under WS, i.e., 0.82(5°)-1.01 g L–1(15°). The total sediment loss varied in the same manner. The total sediment loss under WS was 2.41(5°)-3.78 g m–2(15°), which was much lower than that under TP, i.e., 304.31(5°)-731.23 g m–2(15°). The sediment loss in WS and TP was increased by 56.8%, 140.3%, respectively, as the slope gradient increased from 5° to 15°. This indicated that wheat stubble has greater effectiveness in reducing sediment loss at higher slope gradient. In this study, the sediment control effect of wheat stubble was supported by the infiltration capacity, leading to a significantly reduced runoff in comparison to TP despite a higher slope gradient. These results are consistent with those expected because the stubble cover decreased soil losses (Hueso-González et al., 2015). We also corrected in the abstract section. Line 20-26: The sediment concentration was significantly lower with WS than TP. Compared with TP (304.31-731.23 g m–2), the sediment losses were reduced dramatically in WS (2.41-3.78 g m–2) and the sediment loss slightly increased with slope, however, it was greatly increased as slope increased in TP. These results revealed that the stubble cover was the main factor reducing runoff and sediment losses and improving infiltration, and that stubble showed a great potential to control erosion and conserve

soil and water resources during the summer fallow period in Loess Plateau region.

4. Line269-271: the language should further polish. Response: Line 275-278: WS significantly reduced the average runoff volume from 45.52 mm (TP) to 3.52 mm (WS), and the average sediment loss from 506.56 g m–2 (TP) to 3.08 g m–2 (WS). Therefore, the runoff volume and sediment loss was reduced by 92.27% and 99.39% by the wheat stubble respectively.

Please also note the supplement to this comment:
http://www.solid-earth-discuss.net/se-2016-163/se-2016-163-AC1-supplement.pdf

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Interactive comment on Solid Earth Discuss., doi:10.5194/se-2016-163, 2016.