

## ***Interactive comment on “Straw incorporation increases crop yield and soil organic carbon sequestration but varies under different natural conditions and farming practices in China: a system analysis” by Xiao Han et al.***

### **Anonymous Referee #1**

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The authors present a meta-analysis about the effects of straw incorporation on crop production and SOC sequestration. The methods are technically sound. The authors also consider the effect of climate, straw carbon input, N fertilizer, and duration. This paper confirmed that straw incorporation did create a positive feedback loop of SOC enhancement together with increased crop production which is of great practical significance to agricultural management. However, I think that there are some part to be improved. Please edit closely for English. The sentences are often very long (even 5 lines) and, thus, difficult to follow and absorb immediately (i.e. P10 (line 21-26)). There

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were many repeats of results in the discussion section. I hope that authors could improve it. 3.1 Why only consider the impact of N and K, how the effect of P fertilizer? In the result part, I suggest that authors deleted the range (i.e. range 2.3%–14.5%) P6 line 24-26 “with high levels of straw input corresponding to mean increases of 28.4% (range 18.6%.....(mean 6.9%, range 2.3%–14.5%) straw input (Table 3).” 28.4% of what, I think it is of crop yield. P6 line 19-22“Meanwhile, yield increases greatly varied between crops: 8.7% (range 4.1%–20 13.5%). . . . .the yield response to straw incorporation became smaller (Fig. 4).” I don’t understand the means of this sentence. Here, the yield increase refer to the straw incorporation or control? And could you explain it in the discussion part? P6 line 26 Crop yield responses generally increase . . . . ., delete the “responses” P8 line 9-11: This yield increase is similar in magnitude to a recent globa. . . . . those of the EU (6% increase; Lehtinen et al., 2014).” Could you explain the reason for this differences? P8 line 19 and the greater the annual straw-C input. . . . Change “and” to “And” P8 line 26-29: “Furthermore, N fertilizer addition can enhance both above and belowground biomass production (Ladha et al., 2011; Neff et al., 2002; Kuzyakov and Domanski, 2000), increasing the input of crop roots to stable SOC pools (Gong et al., 2012).” I think this sentence should be improved. P8 line 34 “. . .straw incorporation effect on SOC was observed between the four. . .” change “between” to “among” P 9 line1-2 “compared to large-scale increases in SOC in the majority of croplands in NC, NWC and SC.” Here, the SOC means SOC stocks? P 9 line3: According to a farmer survey across China carried out by (Zhang et al., 2017), Change it to “According to a farmer survey across China carried out by Zhang et al. (2017) P 9 line6: “The impact of land use, MAT, and MAP on straw-induced SOC sequestration was not . . . . . and Huang et al. (2012).” to “The impacts of land use, MAT, and MAP on straw-induced SOC sequestration were not statistically significant (Fig. 5;  $P > 0.05$ ), in agreement with the previous meta-analyses of Liu et al. (2014) and Huang et al. (2012).” P 9 line9: “this wetting and drying cycles” change “this” to “these” P 9 line8-11: “Since alternative wetting and drying has been widely. . .leads to a less stable form of SOC in paddy soils (Cui et al., 2012).” This is a long sentence, and change

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“increases”, “leads” to “increase” and “lead”. P 9 line 23-27: “The lower estimates reported in previous studies focused on shorter time periods. . . . .were included in the analysis by Wang et al. (2015) and Huang et al. (2013).” This is a long sentence. P9 line 28: “result of ” to “result in” P9 line 35-36: Change “Straw incorporation does also reduce” to “Straw incorporation also reduces” P10 (line 7-11) “Our analysis did observe a stro. . . . .(Fig. 4). This observation agre. . . . .those of wheat or barley.” I think that these two sentences are repeated with each other. P10 (line 10-12): Generally, the maize yields is the highest among the three types of crop (wheat, rice and maize). This is not only just because the temperature and precipitation. What’s more, the result in the paper found that climate has no significant effect on the response of SOC to straw incorporation. P10 (line 22) “In China, the areas where triple cropping was adopted usually received adequate rainfall (MAP > 1000 mm, Table S1)” I think the yield increase is due to the temperature and precipitation. P11 (line 5) “crop yield responses increased and peaked at around 15-year and then declined.” Delete “responses” P11 (line 7-8) Change “and the positive role of straw incorporation can play in China and global sustainable agriculture.” to “and the positive role of straw incorporation playing in China and global sustainable agriculture.” Table 2 Add the information about the soil type of the different regions. “Table 1:” to “Table 1.”

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