

## ***Interactive comment on “Precipitation alters plastic film mulching impacts on soil respiration in an arid area of Northwest China” by Guanghui Ming et al.***

### **Anonymous Referee #2**

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This manuscript reports findings from a field experiment on the effect of plastic mulching on CO<sub>2</sub> emissions from soil furrows and ridges, in relationship to temperature and soil moisture. This topic is of interest to readers of HESS. However the presentation of the results and discussion in this manuscript is unclear, making it difficult to interpret and evaluate the findings. Furthermore, the final conclusions are not supported by a critical evaluation of the uncertainty and statistical power of the results.

Specific comments: - The introduction is very long and contains a lot of unnecessary information

- Consistent references to figures are missing from the text

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- Throughout the paper, reference is made to the seasonal respiration. However, it is not clearly defined what is meant with this. I assume it refers to the growing season. However, how many days was this exactly? Was the length of the season the same number of days each year? How was this decided?
- Fig 3: why was CO<sub>2</sub> respiration measured for a different number of days in the different years? This should be addressed in the methods and results section.
- Fig 7: Where do the data of soil respiration with days after irrigation come from? The method section states that respiration was measured every 2 weeks.
- Page 22, line 500-518. Looking at the figure, the data points form a cloud with one outlier. It is not appropriate to assume a linear correlation here.
- The sections on the effect of irrigation and precipitation on soil respiration can be combined as both seem to produce similar effects
- Though the English grammar is good, the argumentation and writing throughout the manuscript is hard to follow and needs careful editing.
- A discussion of the statistical significance and uncertainty in the findings reported here is missing. such an evaluation would be essential here to support their broader claim that plastic mulch increased CO<sub>2</sub> emissions in arid environments.

In addition, all figures, tables and their headings need a lot of improvement:

- Fig. 1 is very hard to read in color and unreadable when printed in black and white. A schematic figure may be clearer and more helpful
- Throughout the manuscript, figures and table headings are missing definitions of abbreviations and labels of the different treatments
- Figure 3 is very unclear The labeling on the y-axis of the top and bottom figure is missing. The scales of the x-axis and y-axis of the 3 graphs are different, making it impossible to compare the data. Furthermore, the layout is inconsistent between

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graphs.

- Figure 4: the layout of this figure is confusing, and hard to read when printed in black and white. In addition, the figure heading states this is the seasonal accumulative soil respiration, whereas the figure shows years. Define this more clearly. Which season is considered here?

- Fig 7: The temperature plot is not needed here, removing it may make the other 2 figures more readable.

- Figure 9: what is G? Why are dates reported here, when other figures use days?

- If I understood the text correctly (page 22, line 500-518), this figure was made using literature values. This should be explicitly stated in the figure heading, and references should be included. Also, define dF in figure heading.

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