

## ***Interactive comment on “Modeling impacts of farming management practices on greenhouse gas emissions in the oasis region of China” by Y. Wang et al.***

**Anonymous Referee #1**

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### General comments

The author states the objective of this research was to evaluate the influence of various climate scenarios and cultivation methods for an oasis region in China as well as to optimize management measures and to obtain theoretical support of sustainable development of oasis agriculture. The tool chosen for this analysis was the DNDC model which the author references, has been compared against many experimental sites in both China and globally. As with any process-based GHG model there is some uncertainty associated with its estimates and validation at one region should not suggest the model is appropriate for another. This leads into the major concern for this

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manuscript in that only 1 year of measured data is available for calibration and validation of DNDC at what the author suggests is a unique agricultural region. These management/climate scenario investigations would have more credibility if the author could better demonstrate that the DNDC model was validated against either multiple locations (with similar characteristics) or multiple years of data (at the same location). Additionally some comparison against auxiliary measurements such as soil water content and soil N would be informative to discern if the underlying drivers for GHG estimates were estimated appropriately as these drivers would be directly influenced by climate change. In this respect it becomes somewhat difficult to ascertain the value of such a modeling exercise. With moderate improvements to the manuscript it would be suitable for publication.

### Specific comments

Pg 3126 Line 14: What is the impact of removing all live vegetation from the treatment plots?

Pg 3130 Line 17-19: How can you say the model results showed that autotrophic respiration of plant roots is the main source of soil CO<sub>2</sub> emissions?

Pg 3132 Line 12: What is a “recession curve”?

Table 1: It is not necessary to have the information presented in Table 1 included in a table. You can just include the relevant text in the manuscript.

Table 2: Please put a footnote to describe the headers for the four different treatments.

### Technical comments

Pg 3122, Line 3: An important method of investigating...

Pg 3122, Line 8: Then sensitivity tests on the validated DNDC model were carried out on three variables:

Pg 3122, Line 14: decreases with manure amendment,..

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Pg 3123 Line 25-26: awkward sentence please reword.  
Pg 3123 Line 29: Studies have shown . . .  
Pg 3124 Line 2: . . .N fertilizer applied are larger than they would be without fertilizer. . .  
Pg 3124 Line 7: However there are fewer studies on the. . .  
Pg 3124 Line 20: Oases are dispersed like “islands”.  
Pg 3125, Line 9: During the experiment, soil. . .  
Pg 3125, Line 24: Can you express in seed per hectare instead of g/m<sup>2</sup>  
Pg 3126 Line 7: . . .fluxes were measured using the closed-chamber method.  
Pg 3126 line 10: What is meant by the test?  
Pg 3126 line 10: . . .was measured using a GC-ECD as detailed by. . .  
Pg 3127 Line 17: . . .the seasonal change of determining factors for. . .  
Pg 3127 Line 23 . . .found that the model underestimated N<sub>2</sub>O emissions. . .  
Pg 3129 Line 2: . . .base fertilizer at planting  
Pg 3130 Line 17: Reduce the number of significant numbers.  
Pg 3131 Line 10-11: Avoid one sentence paragraphs.  
Pg 3131 Line 26: There are too many significant digits (ex. 411.89 kg C /ha/yr)  
Pg 3132 Line 7: Should read “wilting point” not “wilting coefficient”  
Pg 3132 Line 15: Avoid one sentence paragraphs.  
Pg 3132 Line 21: What is “denitrogenation process”?  
Pg 3132 Line 22: . . .which in turns drives denitrification until. . .  
Pg 3132 Line 27: . . . will be produced in fine-textured soil.

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Pg 3133 Line 11: ..was increased by 229%.  
Pg 3133 Line 15: Reduce the number of significant digits.  
Pg 3133 Line 21: ...and from 1113 to 1843 kg C ha<sup>-1</sup> yr<sup>-1</sup>.  
Pg 3134 Line 2: Excess of N fertilizer could significantly. . .  
Page 3134 Line 8: . . . the rate of increase of the CO<sub>2</sub> flux decreased.  
Page 3134 Line 26: . . .were kept constant with the observed. . .  
Pg 3135 Line 6: Reduce the number of significant digits “42% or 31%”  
Pg 3135 Line 25: . . .net GWP for the four scenarios.  
Pg 3137 Line 1: The authors acknowledge the financial support provided by. . .  
An additional suggestion to improve the overall writing style is try not to always write in the style “The results show that” or “Table 2 shows. . .”. The manuscript will read better if the results are just referred to instead of being used as the lead in for the discussion.

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