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 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 CO2 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,...
awkward sentence please reword.

Studies have shown . . .

N fertilizer applied are larger than they would be without fertilizer . . .

However there are fewer studies on the . . .

Oases are dispersed like "islands".

Can you express in seed per hectare instead of g/m2

fluxes were measured using the closed-chamber method.

What is meant by the test?

detailed by . . .

was measured using a GC-ECD as detailed by . . .

the seasonal change of determining factors for . . .

found that the model underestimated N2O emissions . . .

base fertilizer at planting

Reduce the number of significant numbers.

There are too many significant digits (ex. 411.89 kg C/ha/yr)

Should read "wilting point" not "wilting coefficient"

Avoid one sentence paragraphs.

What is "denitrogenation process"?

which in turns drives denitrification until . . .

will be produced in fine-textured soil.

was increased by 229%.

Reduce the number of significant digits.

and from 1113 to 1843 kg C ha-1 yr-1.

Excess of N fertilizer could significantly . . .

the rate of increase of the CO2 flux decreased.

were kept constant with the observed . . .

"42% or 31%"

net GWP for the four scenarios.

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.

Interactive comment on Biogeosciences Discuss., 8, 3121, 2011.