

# ***Interactive comment on “Modeling the biogeochemical effects of rotation pattern and field management practices in a multi-crop (cotton, wheat, maize) rotation system: a case study in northern China” by Wei Zhang et al.***

**Anonymous Referee #2**

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This manuscript describes a modeling effort to evaluate the biogeochemical effects of optimizing a cotton, wheat, maize rotation and field management practices. This work is within the scope of Biogeosciences. Modeling efforts such as this are important given the difficulty in designing field experiments that adequately capture the appropriate biogeochemical parameters for each treatment. Overall this work is important in increasing our understanding the environmental impacts of management practices. However, one major weakness is a lack of sufficient experimental validation.

Specific comments Page 3, lines 67-68 describe the "release potentials of nitrogenous

## Interactive comment

pollutants". It would be helpful to describe these pollutants in the context of agricultural practices (e.g. nitrate leaching, etc.).

Page 6, Section 2.2: This description of the DNDC95 model is somewhat redundant with the introduction and could either be shortened here or removed from the introduction.

Page 8, Section 2.4: Six level-I scenarios are described with increasing the number of cotton rotations with W-M. How were multiple cotton crops incorporated? For R2 was it 2 years of cotton followed by 4 years W-M or 1 or 2 years of W-M between each cotton crop?

Page 23, Section 4.3: This discussion of the BMP should also include a discussion of the potential impacts of weed or disease pressure. Continuous cultivation of these crops could lead to challenges for weed or disease management which does not appear to be adequately addressed by the model. This section should include a discussion of these limitations.

Page 25: The number of scenarios mentioned in the discussion is different from page 9 and 18.

Figure 2: It is difficult to differentiate between the different rotation patterns since most of the symbols are stacked. An additional figure or table showing the order of rotations for R0-R5 would be helpful.

Technical corrections Line 79: Remove "s" from "contents" Line 132: Replace "its" with "associated" Line 619 should not be indented

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Discussion paper

