

Interactive
Comment

Interactive comment on “Dynamics of ammonia exchange with cut grassland: strategy and implementation of the GRAMINAE Integrated Experiment” by M. A. Sutton et al.

M. A. Sutton et al.

Received and published: 6 October 2008

Two recent reviews of our paper (BGD 5, 3347-3407, 2008) highlight a different personal taste from our own on the role of the experimental overview. As such, these comments provide the opportunity to reflect on the purpose and style of such papers.

Environmental scientists are only too familiar with the complex inter-linkages affecting biogeochemical processes. The more one studies a topic, the more it becomes apparent that we need to quantify these interactions in order to develop a holistic understanding. The complexity is such that a full picture can only be developed by working collaboratively, for example, through large experimental campaigns, with many research teams working together.

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When it comes to writing up the results, the findings typically consist of a series of papers covering different aspects of the research. This much is not controversial.

In the present discussion, the controversy focuses on the role of the experimental overview. The personal preference of one reviewer (RC S1687, which is in part supported by RC S1800) seems to be for a shorter description, pointing briefly to the individual papers. By contrast, the authors of the present paper would argue that a good experimental overview should be more than this, and that there is benefit in developing the integrated picture arising from such experiments.

To illustrate this, we consider specific examples from our paper which reports the strategy and implementation of the GRAMINAE Integrated Experiment.

1. Experimental questions and objectives.

It has been suggested by a reviewer that these should be considerably shortened. By contrast, we would argue that the outlining of key questions and objectives provides a vital reference point to understand the experimental strategy and put the specific research papers into context. The objectives were developed successively through five European workshops leading up to the Braunschweig Experiment, and their present form reflects the authors' agreement to distinguish the scientific and technical objectives. This approach has the benefit of providing a transparent overview of the whole experiment.

2. Prior assessment and development.

In Section 3 of our paper we explained the work done to prepare the Integrated Experiment. We are pleased to see that the referees recognize the importance of the prior modelling of potential advection effects. Meeting the experimental aims, however, also required several other prior developments (e.g., REA for NH₃, approach to measure "substrate N"). As these were specifically developed for the experiment, we consider it important to report them.

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3. Relationship to the accompanying papers.

In Section 6, a brief summary of the main objectives, approaches and questions is given for each of the accompanying research papers. To the taste of one of the referees, this section is too long and should be shortened. In fact, this Section summarizes the role of around 17 papers in 2.5 sides, which to our view provides a suitable summary to direct the reader.

4. Overview of experimental conditions.

One of the advantages of such an overview is that it provides a single point of reference to understand the conditions of the experiment. This point is recognized by the reviewers, and it means that the full experimental details do not need to be repeated in subsequent papers. As regards a specific point about the word "Results", this was used in reflection to the "experimental strategy and implementation" part of the title (i.e., resulting conditions). We can rephrase to avoid ambiguity.

5. Benefits of the integrated approach.

We would argue that a key point of such a paper is that it enables the reader to understand why the experiment was designed in such a way and how all the parts fit together. Such an integrated experiment is a major undertaking and it is important to consider the merits and drawbacks. Readers should ask themselves: is the grand concept of joint experiments a good one? If readers were to design their own experiment, what lessons would be learned from the experience? We therefore believe that it is important to be transparent about the approach, including concerns of how to handle potentially conflicting objectives.

These are issues that we personally find important to consider. At the same time, we realise that tastes differ. Some readers prefer brief papers which are quick to read and they are not concerned to see so many technical details. By contrast, other readers value transparency and are upset when a paper fails to explain the rationale fully or to

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specify the conditions that would allow the work to be compared or repeated.

There are many ways to write a paper, and we each have our own preferences. While this is quite natural, we must recognize that each approach has its merits.

In the end, we may ask what really counts. Surely, the key questions for such experimental overviews are: Was the experimental design well founded? Is it possible to follow clearly the experimental conditions? Does it explain how and why the different components fit together?

We would argue that these should be the key issues under review.

Interactive comment on Biogeosciences Discuss., 5, 3347, 2008.

BGD

5, S1904–S1907, 2008

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