



# Scientific publishing for greater research impact

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The year 2021 brings to Nutrient Cycling in Agroecosystems the transition to a new editor-in-chief team. Handing over responsibilities is an appropriate opportunity to contemplate what lessons can be learned to improve the quality and impact of publications. At the same time, it is a good moment to outline a vision for the forthcoming development of the journal. Publishing the highest-quality research requires collaboration between the authors, the editorial team and the referees on a daily basis, regularly supported and guided by the publisher. Scientists will serve in any of these three roles—editor, reviewer, author—on a regular basis. A collegial attitude is needed at any given stage of the publishing process to improve the scientific product. Here, we share some insights from the editorial process for authors to succeed in not only finding approval by editors and referees, but also by readers and users of the scientific

insights. We are convinced that the topics addressed in Nutrient Cycling in Agroecosystems are highly relevant not only for the scientific community, but for the future of our planet given the implications that nutrient cycling in agriculture has on food security, climate change, biodiversity, water and air pollution. Regardless of our role in the publishing process, we must strive to improve quality and outreach of our work rather than the sheer quantity of output. With a rather steady average number of publications of around 80 since 1997, the journal has clearly aimed at maintaining quality rather than growth. We hope that these insights prove useful as a guide to better publications in this and other journals.

## Lessons learned to improve the quality and impact of publications

A lack of fit to the scope of the journal remains the most important reason for rejection at an initial editorial screening (Fig. 1). For Nutrient Cycling in Agroecosystems, this mainly concerns a limited duration of the experiments or complete lack of field observations. Editorial decisions about the fit to the scope of the journal taken before manuscripts are sent out to referees will be honored throughout the review process. In general, time investments by referees and editors are important assets of the journal and must be weighed carefully at every step of the process.

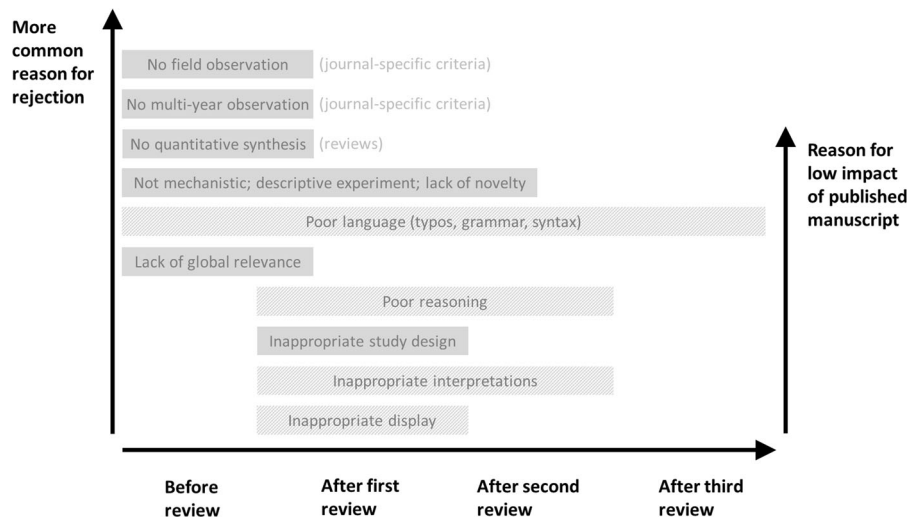
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**Fig. 1** Reason for rejection and perceived impact of published manuscripts in Nutrient Cycling in Agroecosystems 2015–2020, as a function of how common the reason for rejection is and when it occurs in the review process (for illustration; J.





Lehmann, personal impression). Hashed boxes indicate criteria that pertain to manuscript preparation rather than the underlying study

The most important avoidable reason for rejection lies in a lack of mechanistic and novel insight, often paired with a lack of global relevance. Novelty and broad applicability are indeed hard-won criteria, and go back to asking the right scientific question at the beginning of the experiment. All too often, creativity in the sciences is erroneously perceived as centering around finding an interesting answer to a question that is already known. However, the most difficult aspect is in fact to identify the question and associated gap in our knowledge in the first place. In some instances, this deficiency is only recognized after the first review, but the vast majority of rejections occurs before the manuscript is sent out for peer-review, especially for lack of global relevance.

The review process of a journal can mainly shape the quality of data analysis and writing, as experiments can be redone only to a limited extent at this stage. Therefore, the lessons learned and proffered here extend to the stages in which the research is planned and then carried out. Several approaches are needed throughout planning and conducting experiments, analyzing data and writing the manuscript (Table 1) to arrive at not only a publication that convinces referees but also receives widespread positive reception with readers and serves the wider community. Most time should be spent on identifying the most exciting science question that should be posed with a

global readership in mind. This can be achieved by workshopping the question with colleagues; screening the literature whether the question has already been asked; or making figures without data to anticipate results and the insights gained. During experimentation, it can be transformational to use an iterative approach including trial-and-error; examining preliminary results and adjusting or adding experiments to narrow explanations. At the stage of data analyses and writing, it is important to analyze and visualize the data in various ways; identify different storylines; and focus on the 2–3 most compelling stories. The most common adjustment recommended in this journal during review is to utilize these 2–3 stories as subsection titles in the discussion section. Phrasing subsection titles as take-home messages (e.g., “The earth is flat”) not only elevates the main points of the paper but also safeguards against interpreting all results and supports the focus on the most interesting and rewarding aspect of a study. Similarly common are editorial and referee requests to re-write conclusions to avoid repeating results and rather to state unique insights on wider implications of the study. The greatest challenge typically poses crafting a short but insightful article title that must avoid starting with vague terms (e.g., impact, comparison, effect) and is most effective when phrased as a message.

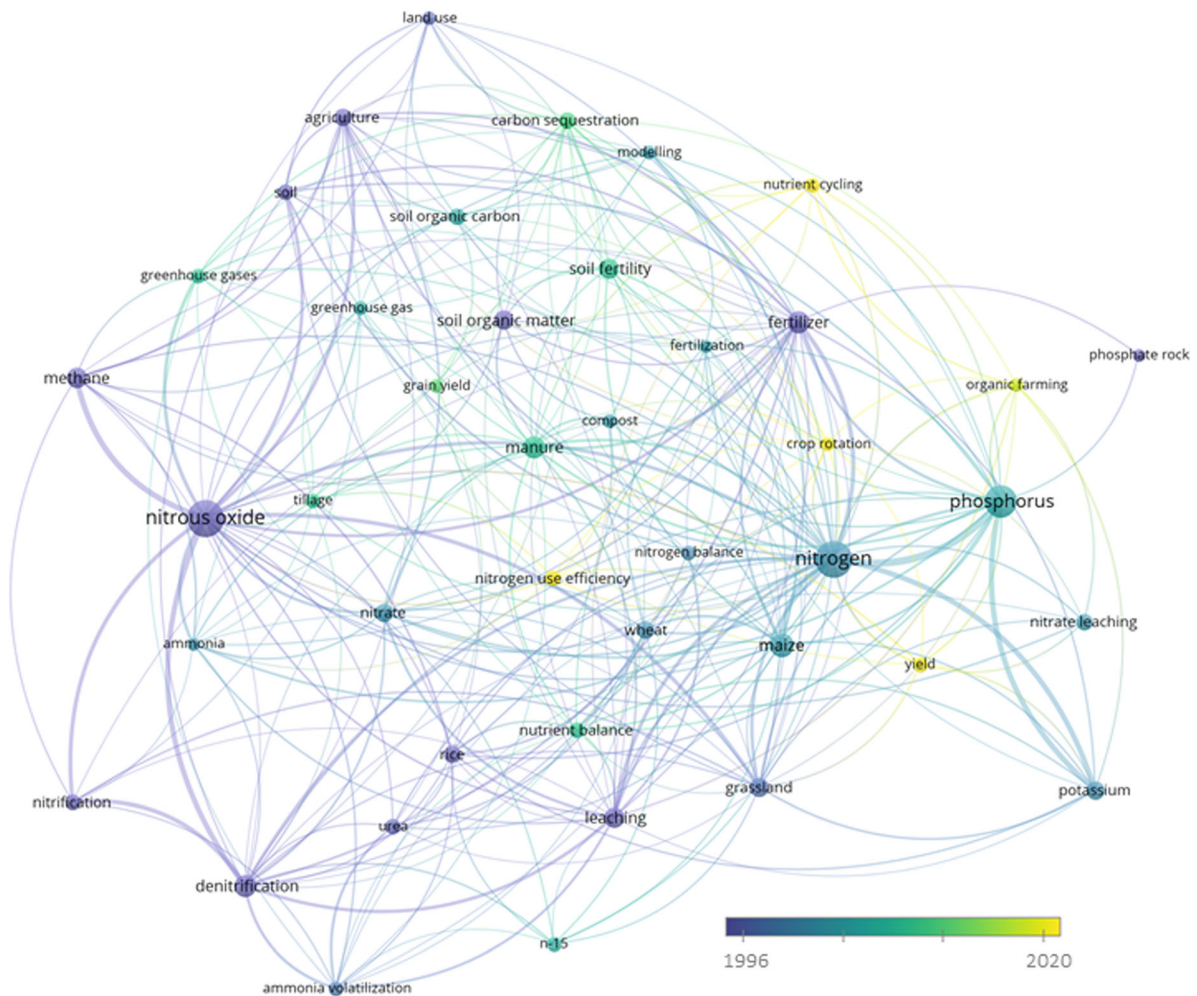
**Table 1** Recommendations for greater impact and acceptance rates of scientific publications

 <b>Planning</b>	 <b>Experimentation</b>	 <b>Data Analysis</b>	 <b>Writing</b>
<p><b>Enhance mechanistic insight and novelty</b></p> <ul style="list-style-type: none"> <li>- Spend most time at this stage</li> <li>- Workshop your question with colleagues</li> <li>- Screen the literature whether has the question been asked</li> <li>- Make figures without data to anticipate results and the insight gained</li> </ul>	<p><b>Enhance mechanistic insight and novelty</b></p> <ul style="list-style-type: none"> <li>- Use an iterative approach; trial and error</li> <li>- Examine preliminary results and adjust your experiment</li> <li>- Try to explain your results and, if they offer multiple explanations, include additional experiments to narrow explanations</li> <li>- Vary experimental conditions to include the widest range of conditions</li> </ul>	<p><b>Enhance mechanistic insight and novelty</b></p> <ul style="list-style-type: none"> <li>- Try out many ways to analyze and visualize the data</li> <li>- Identify various storylines</li> <li>- Focus on 2-3 stories that you want to tell</li> </ul>	<p><b>Enhance mechanistic insight and novelty</b></p> <ul style="list-style-type: none"> <li>- Identify 2-3 novel take-home messages from your study and use those as subsection titles for your discussion section</li> <li>- Explain your results mechanistically</li> <li>- Make use of supplementary online material for additional method information and alternative analyses</li> </ul>
<p><b>Increase global relevance</b></p> <ul style="list-style-type: none"> <li>- Examine what information is needed on a global scale</li> </ul>	<p><b>Increase global relevance</b></p> <ul style="list-style-type: none"> <li>- Vary experimental conditions to include the widest range of conditions</li> </ul>	<p><b>Increase global relevance</b></p> <ul style="list-style-type: none"> <li>- Use continuous axes and models as much as possible</li> </ul>	<p><b>Increase global relevance</b></p> <ul style="list-style-type: none"> <li>- Justify the study and interpret data with global readership in mind (avoid location as a justification or in title)</li> </ul>
<p><b>Conduct a quantitative synthesis (for reviews)</b></p> <ul style="list-style-type: none"> <li>- Ascertain what reviews have been written</li> <li>- Identify new conclusions and new quantitative analyses of published data</li> </ul>		<p><b>Conduct a quantitative synthesis (for reviews)</b></p> <ul style="list-style-type: none"> <li>- Conduct quantitative analyses of published data, preferably using continuous axes (avoid tables)</li> </ul>	<p><b>Conduct a quantitative synthesis (for reviews)</b></p> <ul style="list-style-type: none"> <li>- Identify and order the manuscript by main messages you intend to convey</li> <li>- Identify research recommendations</li> </ul>
<p><b>Design an appropriate experiment</b></p> <ul style="list-style-type: none"> <li>- Use sufficient replication and randomization as appropriate</li> <li>- Avoid bias</li> </ul>	<p><b>Design an appropriate experiment</b></p> <ul style="list-style-type: none"> <li>- Randomize sample analyses</li> </ul>		<p><b>Align with journal-specific criteria</b></p> <ul style="list-style-type: none"> <li>- Study guide to authors and published manuscripts to ascertain suitability for the journal</li> </ul>
			<p><b>Enhance reasoning</b></p> <ul style="list-style-type: none"> <li>- Use specific expression</li> <li>- Stay close to what the data show</li> <li>- Clearly indicate what is speculation and list all likely interpretation</li> </ul>
			<p><b>Improve language</b></p> <ul style="list-style-type: none"> <li>- Recognize that high-quality writing consists of avoiding sloppy mistakes (formatting, typos), poor grammar, both of which can be addressed by professional editing services, and syntax that needs to be addressed by the authors</li> </ul>
		<p><b>Align data with interpretation</b></p> <ul style="list-style-type: none"> <li>- Use a diverse set of data display and analyses</li> </ul>	<p><b>Align data with interpretation</b></p> <ul style="list-style-type: none"> <li>- Interpret only what the data allow; non-significant differences are equal</li> </ul>
		<p><b>Develop insightful display items</b></p> <ul style="list-style-type: none"> <li>- Align data analyses with the main messages and display items</li> </ul>	<p><b>Develop insightful display items</b></p> <ul style="list-style-type: none"> <li>- Examine several different ways of displaying your data</li> </ul>

A similar but distinct issue arises when planning and executing a review article in this journal: the most common reason for rejection is that ‘review’ is taken literally, i.e. with a description of the current knowledge. However, summarizing previous research is not sufficient and this deficiency is hardly ever resolved by revision, with most reviews being rejected at the editorial screening stage. Rather, a synthesis has to arrive at new insights that are not found in the literature. The most common form that such a synthesis can take is quantitative with figures that combine all data in the literature in unexpected ways.

In contrast to these deficiencies that are rarely remedied by and often identifiable before review, poor reasoning, inappropriate study design or display of data, or unsuitable interpretations are often reasons for rejection after review (Fig. 1). Here, referees and editors make their most valuable contribution to the quality of the final product and can help to

significantly improve a publication. On the other extreme, language deficiencies are reason for rejection throughout the review process, and indeed the most important reason for rejection after the second review. Author teams that are not able to revise their manuscript to generate a legible and understandable text over the course of two revisions typically instill little confidence that further revisions yield a publishable manuscript. Ideally, the language should be flawless at initial submission, and this includes not only grammar but also syntax and writing style, as well as, sadly, formatting and typos. However, many authors do not recognize these language deficiencies, and publication of important research should in our opinion not be precluded for lack of initial consideration by the journal. However, editors and referees cannot make up for language deficiencies at any stage of the review process, and thus authors have to utilize professional help, through careful selection of the



**Fig. 2** Visualization of author terms (titles and abstracts) in Nutrient Cycling in Agroecosystems (1996–2020) created with VOSviewer using the function “Co-occurrence”. From the total number of publications (1910), 5053 terms were identified and the term occurrence threshold was set to a minimum of 20, resulting in a display of 42 terms. The size of circles indicates

initial author team as well as professional editorial services.

Journals set important frameworks for successful publishing through their boards. The editorial board is the most important support structure and provides vital input to the editor-in-chief by offering insight to the vision of the journal, promoting the journal among their peers, and/or contributing to peer review as well as serving as guest editors for special issues. Broad disciplinary, geographic, gender, and racial diversity are pivotal to the quality of science that the journal can attract and support. Gender diversity of the board of

the number of occurrences of a term throughout the whole period considered. Terms closer to each other co-occur more frequently together. The lines between terms represent co-occurrence links. The stronger the link between two terms, the thicker the line that is displayed. Terms are colored to indicate the variation over time

this journal only increased from 6 to 20% female members in the last five years, which requires further prioritization and will be addressed by the new editor-in-chief, along with a continuous attention to a more balanced geographical representation.

### Outlining a vision for the development of the journal

An analysis of co-occurrence of author terms in Nutrient Cycling in Agroecosystems from 1996 to

2000 (Fig. 2) illustrates that the main focus of the journal rests on investigating three nutrients (nitrogen, phosphorus and potassium), their cycling processes (with special attention to various nitrogen emissions, in particular denitrification), and four crops (maize, wheat, rice and grassland). The most important scientific topics were changing only slightly over time as shown by the evolution of key terms during the past 25 years (Fig. 2). While a certain development from more agronomic studies with specific nutrient sources such as phosphate rock or urea towards studies with a greater environmental component can be noticed, overall the topics have remained remarkably constant.

A journal has to remain relevant to its authors and readers, and to nurture the community in order to generate new insights. Interdisciplinarity has been a hallmark of this journal that publishes focused studies on microbiology or biogeochemistry, as well as life-cycle assessments or socioeconomic studies. This allows an unusual breadth of views that benefit publishing exciting special issues that transcend individual disciplines to arrive at new insights with broad political and societal implications. We encourage you to engage with us during this transition of editor-in-chiefs by providing suggestions for special issues and helping us build an even better publishing platform.

The evolution of key words over time (Fig. 2) triggers many questions and ideas for increasing the breadth of the journal. Although there is no doubt that efficient management of nitrogen and phosphorus remains of paramount importance, it would certainly be important to foster a greater diversity of nutrients

addressed in this journal, including micronutrients, in view of balanced plant nutrition and their implication in a balanced human nutrition, as well as the management of finite resources. Although some biological processes such as greenhouse gas emissions are already frequent topics in this journal, symbiotic nitrogen fixation and effects of soil enzymes, various soil organisms as well as overall biodiversity on nutrient cycling could be addressed more often. A third area that will be developed further concerns the recycling of nutrients, in order to approach a more circular and more sustainable agriculture. Finally, interactions of nutrient cycling with water availability to plants are becoming more important with climate change and associated implications for desired resilience and resistance of agroecosystems. Hence, we expect this area to grow over the next years, together with technological aspects such as precision farming and remote sensing, as well as the modelling of nutrient cycling at different scales (i.e., within farm, watershed, regional, global scale) to be used as tools for analysis and decision-making. We look forward to developing the journal in this sense together with the editorial board.

#### **Compliance with ethical standards**

**Conflict of interest** Melania Ruiz Esparza Cataño is an employee of Springer Nature.

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