Science Societies

A call to action for agricultural journals and authors

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Incomplete data reporting can limit reproducibility, obscure important findings, and reduce the value of agricultural research for future analyses. A new study examines data-reporting requirements across agricultural journals and outlines practical steps authors, reviewers, and editors can take to strengthen transparency, support data reuse, and prepare research for an AI-driven future.

When researchers from the Conley and Smith labs recently gathered peer-reviewed literature for a meta-analysis, they hit a familiar wall. Numerous studies lacked critical reporting details: variability measures (such as standard error or standard deviation) were omitted, sample sizes went unrecorded, raw datasets were unavailable, and experimental treatment designs were ambiguous. Furthermore, incomplete metadata, including missing information on agronomic management practices, often made it unfeasible to replicate studies. These gaps don't just complicate meta-analyses; they can weaken science in general by impacting reproducibility and hindering AI-driven data synthesis throughout the agricultural sciences.

These systemic omissions raised urgent questions for the researchers: Are these gaps occurring because journals are neglecting policy enforcement? Are peer reviewers missing key details? Or are authors not complying with the journal policies? To investigate these questions, a collaborative team from the University of

Wisconsin–Madison and Mississippi State University examined current data-reporting requirements across major agricultural science journals and identified significant gaps that may limit transparency, reproducibility, and the broader usability of research data. The efforts of the study resulted in a recently published article in *Agronomy Journal* (Colet et al., 2026; Figure 1).

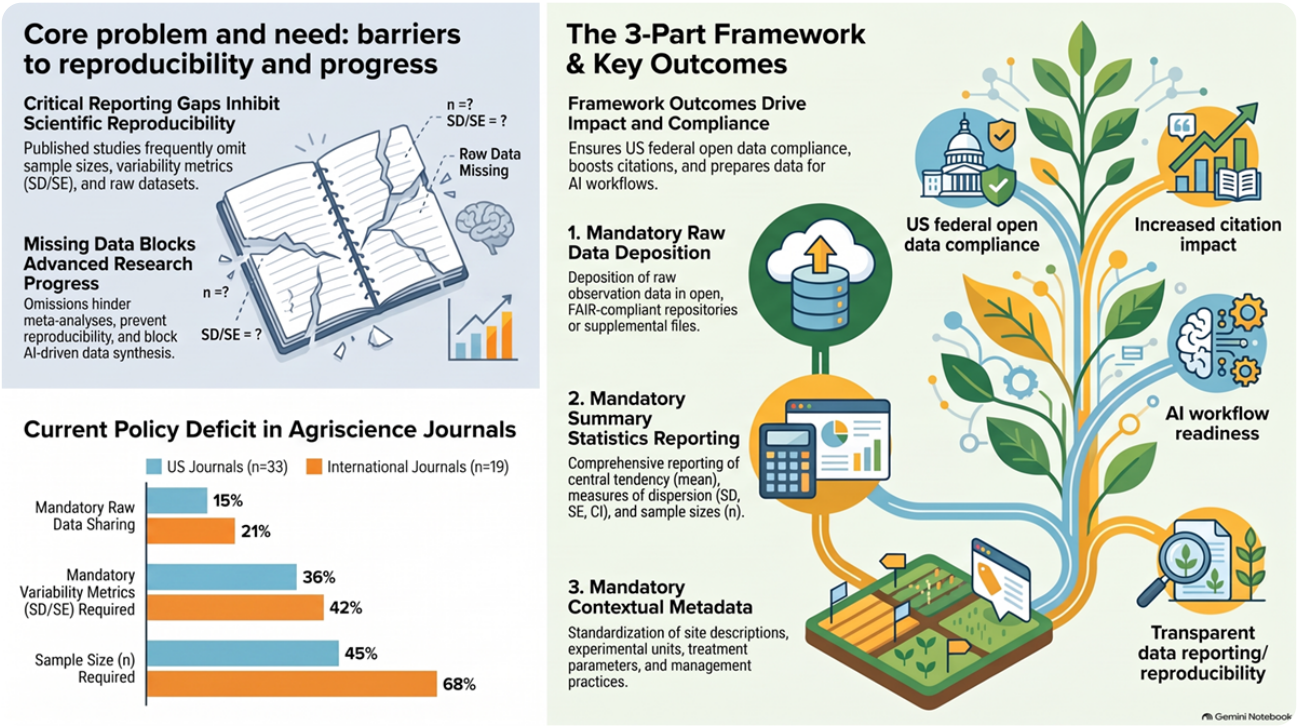


Figure 1. *Barriers to scientific progress in agriscience journals and a proposed three-part framework for data reproducibility.*

Gaps in journal policies limit reproducibility

To evaluate existing mandates, the authors systematically reviewed editorial guidelines on data transparency, reporting standards, and reproducibility across agricultural journals. Journals were grouped by publishing organization and editorial governance. For example, one cohort focused on scientific society journals, including those published by the American Society of Agronomy, Crop Science Society of America,

and Soil Science Society of America. The team evaluated each journal's requirements for data and code availability, statistical and software transparency, and documentation of experimental designs and metadata.

The evaluation of these editorial policies revealed several major obstacles. In many cases, explicit data-reporting mandates were absent. Where policies did exist, requirements were often scattered across multiple webpages and downloadable PDFs. In addition, guidelines often used vague, permissive language, such as “should,” “may,” “can,” “preferred,” or “encouraged,” rather than explicit, enforceable requirements using terms such as “must.”

The policy evaluation revealed a clear pattern: data-reporting requirements remain strikingly limited across both U.S. and international agricultural journals. While data availability statements are widely required, only 15% of U.S. agricultural journals mandate the sharing of raw data. The study's authors argue that availability statements must direct readers to accessible datasets in an active repository or supplementary files, rather than relying on vague statements such as “Data available upon request.” Beyond data access, basic statistical reporting was also frequently inadequate; graphs and tables often omitted standard errors or standard deviations, and unclear descriptions of experimental designs meant that sample sizes and replication counts were difficult to determine.

Building a framework for transparent, AI-ready research

To bridge these gaps, journal boards and editors can adopt and enforce several baseline practices:

- **Clarify expectations:** Editorial boards should clearly define baseline reporting standards within author guidelines.

- **Establish firm mandates:** Journals must move from passive recommendations to explicit data-reporting requirements.
- **Deposit raw datasets:** Authors should share raw datasets.
- **Include complete summary statistics:** Submissions must explicitly report central tendencies, measures of variability, and sample sizes.
- **Standardize metadata:** Authors must report site characteristics, experimental units, treatment designs, management histories, and reasons for missing data, among other relevant details, to support reproducibility.
- **Uphold editorial standards:** Editors should strictly enforce these requirements, making non-compliance grounds for rejection.
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  Standardized reporting, accessible datasets, and complete metadata help ensure that agricultural research can be verified, reused, and built upon by future scientists. AI-generated image courtesy of Microsoft Copilot.

Naturally, adopting these standards presents practical challenges. In an increasingly data-rich research environment, privacy concerns and corporate proprietary policies can limit public access. Additionally, repository curation requires significant labor and time. To mitigate this burden, researchers should organize data according to repository requirements from the start of a project and incorporate curation budgets directly into grant proposals. Finally, secondary data users should consider offering

co-authorship to dataset originators when their contributions meet authorship criteria and should always cite both the original publication and the dataset using their respective DOIs.

Despite these challenges, adopting standardized data reporting delivers significant benefits:

- **Increased citation impact:** Studies published with open, accessible datasets can achieve higher citation rates.
- **Enhanced research visibility:** Publicly sharing data expands the reach, utility, and real-world application of published findings.
- **Regulatory compliance:** Mandating data availability ensures research meets evolving federal and funding-agency requirements.

As researchers, many of us have omitted raw data or metadata in past publications. However, for the agricultural research community, these findings highlight an opportunity to strengthen data-reporting practices. By adopting higher standards for data sharing, statistical reporting, and metadata documentation, researchers, editors, and journals can help ensure that agricultural science remains transparent, reproducible, accessible, and ready to support the next generation of AI-driven innovation.

Reference

Colet, F., Severo Silva, T., de Souza, S., Sharma, A., Hyzer, L., Mourtzinis, S., Lo, J.C.M., Drewry, J.L., Colquhoun, J.B., Hadachek, J., Nocco, M., de Leon, N., Werle, R., Groves, R., Hall, S., Conley, S.P., & Smith, D.L. (2026). Modernizing data reporting in agricultural science: a framework for transparent, reproducible, and AI-ready research. *Agronomy*

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