Mark Twain popularized the saying:

There are three kinds of lies; lies, damned lies and statistics.

This quotation is unfortunately associated with mistrust and misunderstanding of statistical applications. Perhaps it is more appropriate that we look for guidance from W. Allen Wallis, one-half of the duo that gave us the Kruskal–Wallis one-way analysis of variance, who said,

Statistics is a body of methods for making wise decisions in the face of uncertainty.

In order to shed light on the use and misuse of statistics in the agricultural and natural resource sciences, Agronomy Journal set about to provide its authors and readers with useful information on statistical approaches and strategies for conducting and publishing scientific information.

As readers, researchers, reviewers, or as editors of scientific literature, we may have come across situations or articles where we had serious doubts whether the most appropriate method to analyze an experiment or set of experiments was used. Furthermore, ever-increasing computing power has enabled researchers to use more intensive and complex statistical methods with the help of new and updated general and special purpose statistical software programs always becoming available. With these more complex computations, we now also have the ability to design more advanced and efficient experiments. We as biological scientists may or may not enjoy or have the time or training for learning to properly interpret, and communicate your excellent science in the best possible way.

forward-thinking and meaningful experimentation with the most appropriate and accurate methodology available. With these thoughts in mind, Brent Godshalk, then Editor of the Agronomy Journal, and his Editorial Board recognized the need for communications on these topics at the 2011 Agronomy Journal Board meeting and chartered the Statistics Committee.

The Agronomy Journal Statistics Committee set a goal to provide clear guidance on the appropriate use of effective statistical tools and procedures to Agronomy Journal readers and contributors; thereby allowing them to focus on and support their science with proper statistical approaches. To this end, the committee and the ASA Biometry and Statistical Computing Section co-sponsored the Symposium, “Statistical Concepts and Tools to Aid in Publishing Proper Research Conclusions” at the 2012 ASA, CSSA, and SSSA International Annual Meetings. Our second and major output is this series of articles in the Agronomy Journal. The articles will also be part of the “Special Sections” webpage (https://www.agronomy.org/publications/aj/special-sections). All of the software code that was presented in appendices in separate articles is also available in one file that can be assessed at https://www.agronomy.org/publications/aj/special-sections. The software code is also a supplemental file with this introduction article.

These articles and the additional output of our committee are targeted to support scientists in key basic concepts and methodologies in statistics and biometry. We believe that many of us need support in these basic concepts as an effective means of complementing the trend to focus on supporting scientists to learn exceedingly more complex and advanced statistical tools and methodologies. Neither the committee nor the contributing authors pretend that this effort is comprehensive or will solve all the challenges of data analysis and interpretation facing the agricultural and natural resources research communities. Our goal is that Agronomy Journal contributors and others in the scientific community strive to learn and use the newer, more advanced statistical methodologies—but first are sure to understand and use the basic methodologies when these are more appropriate. We hope that each of you agree with the goal of striving to conduct, interpret, and communicate your excellent science in the best possible way.

Each article in this series received robust reviews from several reviewers. More than 30 anonymous reviewers in all donated their time, and we thank them for the substantial contribution they have made to this series.