R for Plant Nutrition Research

T.S. Murrell, Ph.D.

2023-12-15

Table of contents

Preface

This is a Quarto book.

To learn more about Quarto books visit https://quarto.org/docs/books.

```
1 + 1
```

```
[1] 2
```

1 Acknowledgements

The authors with to acknowledge the many farmers, agricultural service providers, university students, faculty, and staff, as well as the statisticians and data scientists who have shared their time, expertise, insights, and guidance over the past many years. All of these interactions have created the vision for this work.

quarto publish gh-pages

2 Introduction

This book is intended to be a living compendium of procedures used in the field of plant nutrition. Because it is housed on GitHub, it is open-source and open-access, allowing interested experts to contribute, either by submitting additional procedures or by editing existing ones. We hope that, over time, this work becomes a source of best practices operationalized routinely by students, staff, and faculty in educational organizations, as well as by professionals in business and industry.

We dedicated ourselves to using only software that is open-access. This decision is meant to democratize this guidance for everyone with access to only a computer and the internet. Software applications with hidden fees and paywalls were avoided. All content was produced using Quarto for books, and using GitHub as a repository for all book content, including figures and data sets. Editing was performed in RStudio Desktop, and all code chunks were written in R. When topics related to spreadsheets were addressed, we used Google Sheets.

We hope you find this resource useful. If you see ways to improve it, please contact info@apni.net.

3 Preparing External Data

Before we import data into R, we need to ensure that they are ready. Key things to check are:

- the way data are organized
- the labels used
- data classes

3.1 Data Organization

R requires that data be in a "tidy format." An excerpt taken from

-

References