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John S. Boyer

Measuring the Water Status of Plants and Soils



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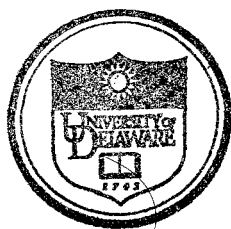
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Contents

Preface	ix
Chapter 1 Why Measure the Water Status of Plants and Soils?	1
A Little Thermodynamics	4
The Value of Thermodynamic Equilibrium	9
Additional Readings	11
Chapter 2 Pressure Chamber	13
Principles of the Method	14
Pressure Chamber Theory	15
Types of Pressure Chambers	22
How to Make Measurements	23
Working with Plant Tissue	27
Measuring the Components of the Water Potential	32
Precautions	39
Appendix 2.1—Pressure Chamber Manufacturers	48
Chapter 3 Thermocouple Psychrometer	49
Principles of the Method	49
Theory of Psychrometry	52
How Thermocouples Work	54
Types of Thermocouple Psychrometers	55
How to Make Measurements	61
Working with Plant Tissue	73
Working with Soils	78
Measuring the Components of the Water Potential	79

Precautions	86
Appendix 3.1—Psychrometer Manufacturers	98
Appendix 3.2—Water Potentials (Osmotic Potentials) of Sucrose Solutions	99

Chapter 4 Pressure Probe **103**

Principles of the Method	103
Pressure Probe Theory	106
Using the Probe	114
How to Make Measurements	122
Precautions	134
Appendix 4.1—Building a Pressure Probe	138

Chapter 5 Measuring the Water Status of Plants and Soils: Some Examples **143**

Practical Benefits of Thermodynamic Equilibrium	143
Large Tensions Demonstrated in the Apoplast	144
Single Cell and Tissue Measurements Compared	145
Temperature, Membrane Transport, and Cell Walls	147
Importance of Growth	148
Growth-Induced Water Potentials	151
Growth at Low Water Potentials	153
Turgor Measured with a Pressure Chamber	154
Varietal Differences in Midday Water Potential under Field Conditions	155
Osmotic Adjustment	158
Water Relations of Reproductive Tissues	161

References	163
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Index	173
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Preface

This book is written as a companion to the text by Kramer and Boyer (1995) "Water Relations of Plants and Soils" and is intended for students who need to use some of the methods described there. Water is pervasive in biology, and a student of plants often must face measuring plant water status early in his or her career and virtually alone. Universities sometimes cannot afford to teach a course on the subject but the methods generally are not intuitive. The student must proceed as well as possible, often without a physics or physical chemistry background and with mathematics that have become a little rusty.

For these students and anyone else who wonders how water affects plant growth, I hope the information presented here will be an easy introduction to the measurement techniques. The book is not a detailed review of the literature nor of theory. It does not deal with all the methods for measuring the water status of plants and soils. Instead, it considers the three most used and useful methods and aims at practical laboratory concepts, with considerable effort to keep the mathematical and physical treatments simple and illustrated with examples. Where possible, pictures are employed to give a better understanding of the procedures. I hope my colleagues will forgive the sometimes informal approach and occasional oversimplification.

With this book and an instrument on which to practice, it should be possible to make measurements in plants and soils without some of the pitfalls that are so common. Practically all that is known about plant water relations comes from thoughtful and careful measurements, often by two or more different techniques, and the avoidance of pitfalls may help to approach this ideal.

For the production of this book, grateful acknowledgement is extended to several people. Special thanks are given to Peggy Conlon for typing, editing, and handling the references, and to Dr. An-Ching Tang for the artwork. Thanks are due Karen Lauer and Dr. Michael Lauer for reading parts of the work and for many valuable suggestions. I am immensely grateful for the help and encouragement of Professor Paul J. Kramer in whose laboratory some of the methods were developed while I was a

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