
Preface

We have seen many changes in growth chambers since the first multiple chamber phytotron of Frits Went in the 1940s. Plant growth is better understood, and light sources and control equipment have been improved. The complexity of the systems has increased, however, and the demands for precision and accuracy by plant scientists have heightened. For these reasons, this growth chamber handbook has been developed to pull together the known information for effective use of growth chambers for plant research.

Although it is focused toward the researcher with little knowledge of growth chambers, it should also be of value as a handbook of reference information for all growth chamber users. This handbook should be a helpful guide for both operations and maintenance and for the purchase of new chambers.

Chamber operation/management requires a number of skills, and it was difficult to find all the background in one location or with one person. When we outlined this handbook, it was clear we needed the expertise of a number of individuals and selected the best experts in the country to write the various chapters. Each is an expert in his/her own right, and we are proud to have gathered such talent. These authors have been involved in growth chamber research for many years and have met annually to discuss new technologies and problems in growth chamber research. This growth chamber group, begun in 1969, was structured initially as a working group of the American Society of Horticultural Science and published the first growth chamber book as "A Growth Chamber Manual: Environment Control for Plants" in 1978. About this time, the group broadened its involvement of plant scientists and engineers and organized a USDA working group as the North Central Regional 101 Committee.

This committee took the leadership to update the growth chamber information and produce this thoroughly rewritten and more comprehensive Plant Growth Chamber Handbook.

There is real need for the information found in this handbook because plant growth chambers are found in practically every high school, college, or university plant science department in the country. Plant growth chambers have the potential to achieve consistent environmental conditions not found in greenhouses or fields, but if the chambers are not managed correctly, conditions will be variable and plant growth cannot be repeated. Therefore, it is important that managers and users understand the operation and management of the chambers. In addition, growth chambers are expensive to operate and maintain, so managers need to operate them critically for most efficient use.

The editors want to commend the contributing authors for their patience through many delays. We appreciate the efforts of these authors who, with no monetary reward and just knowing the task is sorely needed, performed a job "well done."

We would like to thank Tom Fretz, who was administrative representative for the NCR 101 committee while Associate Dean at Iowa State University, for his significant support in having this manual edited and published as a station report at Iowa State University. We thank Carol Greiner, experiment station editor at Iowa State University, for her very careful editorial efforts to coordinate the handbook.

We, the editors, hope this handbook will serve as a bible, handbook, manual, etc., and be available at every growth chamber operated for plant research.

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