FLOWERING AND FRUITING IN COTTON

THE COTTON FOUNDATION

Reference Book Series

The Cotton Foundation was created in 1955 to foster research and education for the cotton industry. Supported by membership dues and grants from agribusiness firms, the Foundation plays an integral role in focusing attention to high priority needs. Foundation members include the world's finest manufactures and suppliers of cotton machinery, plant health products, transgenic technologies, planting seed, testing instruments, processing materials; and consulting, financial and communications services

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We are pleased to publish ***FLOWERING AND FRUITING IN COTTON***, the eighth in the series of cotton reference books. The first volume, ***COTTON PHYSIOLOGY*** was published in 1986; the second, ***WEEDS OF COTTON: Characterization and Control*** was published in 1992; the third, ***COTTON INSECTS AND MITES: Characterizations and Management***, was published in 1996; the fourth volume, ***VEGETABLE OILS AND AGROCHEMICALS*** became available in 1994; the fifth volume, ***COTTON HARVEST MANAGEMENT: Use and Influence of Harvest Aids*** and the sixth volume, ***BOLL WEEVIL ERADICATION IN THE UNITED STATES THROUGH 1999*** published in 2001; and the seventh volume, ***STRESS PHYSIOLOGY IN COTTON*** published in 2011.

Bill M. Norman
Executive Director
The Cotton Foundation
7193 Goodlett Farms Parkway
Cordova, Tennessee 38016

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Delivering innovation to the farm starts with research and development. This year Monsanto invested more than $1 billion to develop the most robust pipeline of products in the industry. Today, Monsanto researchers throughout the world are actively working to discover, develop and deliver the next generation of agricultural products so farmers can get more out of each acre of farmland. Everything Monsanto does is aimed at helping to make agriculture more productive and more profitable for farmers, as well as more efficient and more sustainable for our earth.

Monsanto is proud to be a member of the Cotton Foundation and sponsor of ***FLOWERING AND FRUITING IN COTTON***, the eighth book in the Cotton Foundation's cotton reference book series. The sponsorship is a reflection of the company's belief that continued support of the development of technologies and materials that promote the production of more cost-effective, higher yielding cotton, will make a stronger cotton industry.

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Edited By
DERRICK M. OOSTERHUIS
AND
J. TOM. COTHREN

Executive Editor and Publishing Coordinator
WILLIAM C. ROBERTSON

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COTTON PHYSIOLOGY BOOK SERIES

FOREWORD

The *Cotton Physiology Book* series started with the first publication ***COTTON PHYSIOLOGY*** in 1985, edited by J.R. Mauney and J.M. Stewart, and the second book ***PHYSIOLOGY OF COTTON*** book edited by J.M. Stewart, D.M. Oosterhuis, J.J. Heitholt, and J.R. Mauney published in 2010. This series is being continued using a smaller book format with each future book covering a specific pertinent topic. The smaller book format will facilitate timely publication each year and reduce the cost per book. The books will be published in book form as well as on CD's under the auspices of the National Cotton Council as a continuation of the original Cotton Physiology book published in 1985. Each book will incorporate a special symposium on a topic chosen by members of the National Cotton Council, Agronomy and Physiology Conference and held at the Beltwide Cotton Conferences. Prominent speakers will be invited to partake in the symposium, and together with additional invited authorities, will make up the subsequent book. The first of the new small book physiology of cotton series was on ***STRESS PHYSIOLOGY IN COTTON*** and was published in 2011. The next symposium was held at the Beltwide Cotton Conferences in Atlanta in January 2011 and the subsequent book entitled ***FLOWERING AND FRUITING IN COTTON*** will be published in 2012.

PREFACE

For cotton production to be sustainable and profitable, it is essential to understand the growth of the cotton plant and how the plant responds to environmental stress. The cotton plant has complex growth pattern due to its perennial nature, indeterminate growth habit, and sympodial fruiting pattern. Furthermore, the crop is especially responsive to changes in the environment and management, particularly during reproductive development. Plants in production systems are continually exposed to various stresses, including extreme temperatures, inadequate water, nutrient deficiencies, and pathogens. The effect of these stresses on plant growth and yield depends upon the severity and timing of the stress and the ability of the plant to respond and adapt to the stress. Previous cotton physiology books have covered the fundamental physiological functions, metabolism and responses to stress over the whole growth period of the cotton plant. The current book focuses on reproductive growth and responses to environmental stresses. This phase of development period is particularly sensitive to adverse conditions, and is important for the development for optimum yields and fiber quality. Hence, a sound understanding of physiological processes and how they respond to stress during this period of yield development is essential to formulate strategies, agronomic and genetic, to counteract or ameliorate stress. Plant responses to environment and their ability to adapt determine the success of that plant genotype for successful production to achieve maximum yields. Therefore, understanding the effects of various stresses on the physiology of plants during the critical reproductive development is essential for an understanding of resistance and survival mechanisms for breeding for stress resistance and for formulation of improved management practices. Individuals involved in growing cotton should be familiar with the requirements of the cotton plant in relation to growth and yield development, in order to use management aids to know the most profitable time to irrigate, apply plant growth regulators, herbicides, foliar fertilizers, insecticides, defoliants, etc. The chapters in this book were assembled to provide those dealing with the production of cotton with the basic knowledge of the physiology of the plant during the critical reproductive stage for optimum and profitable management of the cotton crop.

CONTRIBUTORS

Dr. Brian G. Ayre
Department of Biological Sciences
University of North Texas
1155 Union Circle, #305220
Denton, TX 76203
bgayre@unt.edu

Dr. Allen G. Green
CSIRO Division of Plant Industry
PO Box 1600
ACT 2601, Australia
allan.green@csiro.au

Dr. Greg Constable
CSIRO Division of Plant Industry
Cotton Research Unit
P.O. Box 59, Narrabri
NSW 2390, Australia
Greg.Constable@csiro.au

Dr. Dimitra Loka
Department of Crop, Soil, and Environmental Sciences
University of Arkansas
1366 Altheimer Drive
Fayetteville, AR 72704
dloka@uark.edu

Dr. Tom Cothren
Department of Soil and Crop Sciences
Texas A & M University
Heep Center
College Station, TX 77843
jtcothren@tamu.edu

Dr. Jack R. Mauney
161 E. 1st Street, Suite 4
Mesa, AZ 85201
jacmauney@juno.com

Dr. Vladimir A. da Costa
Dow AgroSciences LLC
Sloughhouse, CA 95683
vdacosta@dow.com

Dr. Roisin C. McGarry
Department of Biological Sciences
University of North Texas
1155 Union Circle, #305220
Denton, TX 76203
rmcgarry@unt.edu

Dr. Meredith Errington
University of Sydney
NSW, Australia
meredith.anne.errington@monsanto.com

Dr. William R. Meredith Jr.
USDA-ARS (retired)
P.O. Box 225
Stoneville, MS 38776

Dr. Derrick Oosterhuis
Department of Crop, Soil, and Environmental Sciences
University of Arkansas
1366 Altheimer Drive
Fayetteville, AR 72704
oosterhu@uark.edu

Dr. Michael R. Stiff
Crop Science and Plant Biology
North Caroline State University
4405 Williams Hall
Raleigh, NC 27695
mrstiff@ncsu.edu

Dr. Candace Haigler
Crop Science and Plant Biology
North Caroline State University
4405 Williams Hall
Raleigh, NC 27695
Candace_Haigler@ncsu.edu

Dr. William T. Pettigrew
Crop Production Systems Research Unit
141 Experiment Station Road
PO Box 350
Stoneville, MS 38776
Bill.Pettigrew@ars.usda.gov

Dr. Qing Liu
CSIRO Division of Plant Industry
PO Box 1600
ACT 2601, Australia
Qing.Liu@csiro.au

Dr. Ian Rochester
CSIRO Division of Plant Industry
Cotton Research Unit
22888 Kamillaroi Hwy
Locked Bag 59, Narrabri
NSW 2390, Australia
Ian.Rochester@csiro.au

Dr. Danny J. Llewellyn
CSIRO Division of Plant Industry
PO Box 1600
ACT 2601, Australia
Danny.Llewellyn@csiro.au

Dr. Surinder P. Singh
CSIRO Division of Plant Industry
PO Box 1600
ACT 2601, Australia
Surinder.Singh@csiro.au

Dr. John Snider
Department of Crop and Soil Sciences
University of Georgia
115 Coastal Way
Tifton, GA 31794
jlsnider@uga.edu

Dr. Randy Wells
Crop Science and Plant Biology
North Carolina State University
2210 Williams Hall, Campus Box 7620
Raleigh, NC 27695
randy_wells@ncsu.edu

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