Manjit S. Kang Editor

Handbook of Formulas and Software for Plant Geneticists and Breeders



Pre-publication REVIEWS, COMMENTARIES, EVALUATIONS . . .

"This is indeed a reference book that can help plant scientists identifying friendly software to analyze their experimental data. This book is a compendium of analytical tools that can save precious time and effort for plant geneticists and breeders, making their data analysis more efficient, accurate, and informative. It describes freely available software that could be time-consuming to develop by individual research programs. I value this book as a good teaching tool where students can become familiar with software and analytical methods and learn how to analyze experimental data."

Javier Betran, PhD

Assistant Professor, Corn Breeding and Genetics, Department of Soil and Crop Sciences, Texas A&M University The title of this book is a very concise and precise description of the contents; it is a great handbook for addressing many of the theoretical and applied aspects of plant genetics and breeding. There is something for everyone involved in these fields.

The general layout is very consistent, which makes it easy to find particular areas of interest. Most chapters contain useful examples and sample data which are quite helpful when working through some of the formulas for the first time, or in loading them into spreadsheets. The contributing authors have been selected for their expertise in their particular fields and for their ability to convey their messages effectively. The final chapter is typical of the clear, practical, and often classical examples in that it gives a single formula to determine the number of plants needed to recover a predetermined number of individuals with a desired trait at a particular probability level when the genetic nature of the trait is known."

Duane E. Falk, PhD

Associate Professor and Cereal Breeder, Plant Agriculture Department, University of Guelph, Ontario

NOTES FOR PROFESSIONAL LIBRARIANS AND LIBRARY USERS

This is an original book title published by Food Products Press[®] and The Haworth Reference Press, imprints of The Haworth Press, Inc. Unless otherwise noted in specific chapters with attribution, materials in this book have not been previously published elsewhere in any format or language.

CONSERVATION AND PRESERVATION NOTES

All books published by The Haworth Press, Inc. and its imprints are printed on certified pH neutral, acid free book grade paper. This paper meets the minimum requirements of American National Standard for Information Sciences-Permanence of Paper for Printed Material, ANSI Z39.48-1984.



FOOD PRODUCTS PRESS® Crop Science Amarjit S. Basra, PhD Senior Editor

New, Recent, and Forthcoming Titles of Related Interest:

- Mineral Nutrition of Crops: Fundamental Mechanisms and Implications by Zdenko Rengel
- Conservation Tillage in U.S. Agriculture: Environmental, Economic, and Policy Issues by Noel D. Uri
- Cotton Fibers: Developmental Biology, Quality Improvement, and Textile Processing edited by Amarjit S. Basra

Heterosis and Hybrid Seed Production in Agronomic Crops edited by Amarjit S. Basra

- Intensive Cropping: Efficient Use of Water, Nutrients, and Tillage by S. S. Prihar, P. R. Gajri, D. K. Benbi, and V. K. Arora
- Physiological Bases for Maize Improvement edited by María E. Otegui and Gustavo A. Slafer
- Plant Growth Regulators in Agriculture and Horticulture: Their Role and Commercial Uses edited by Amarjit S. Basra
- Crop Responses and Adaptations to Temperature Stress edited by Amarjit S. Basra
- Plant Viruses As Molecular Pathogens by Jawaid A. Khan and Jeanne Dijkstra
- In Vitro Plant Breeding by Acram Taji, Prakash P. Kumar, and Prakash Lakshmanan

Crop Improvement: Challenges in the Twenty-First Century edited by Manjit S. Kang

- Barley Science: Recent Advances from Molecular Biology to Agronomy of Yield and Quality edited by Gustavo A. Slafer, José Luis Molina-Cano, Roxana Savin, José Luis Araus, and Ignacio Romagosa
- Tillage for Sustainable Cropping by P. R. Gajri, V. K. Arora, and S. S. Prihar
- Bacterial Disease Resistance in Plants: Molecular Biology and Biotechnological Applications by P. Vidhyasekaran
- Handbook of Formulas and Software for Plant Geneticists and Breeders edited by Manjit S. Kang
- Postharvest Oxidative Stress in Horticultural Crops edited by D. M. Hodges

Encyclopedic Dictionary of Plant Breeding and Related Subjects by Rolf H. G. Schlegel

Handbook of Processes and Modeling in the Soil-Plant System edited by D. K. Benbi and R. Nieder

- The Lowland Maya Area: Three Millennia at the Human-Wildland Interface edited by A. Gómez-Pompa, M. F. Allen, S. Fedick, and J. J. Jiménez-Osornio
- Biodiversity and Pest Management in Agroecosystems, Second Edition by Miguel A. Altieri and Clara I. Nicholls
- Plant-Derived Antimycotics: Current Trends and Future Prospects edited by Mahendra Rai and Donatella Mares
- Concise Encyclopedia of Temperate Tree Fruit edited by Tara Auxt Baugher and Suinan Singha

Handbook of Formulas and Software for Plant Geneticists and Breeders

Manjit S. Kang Editor



Food Products Press® The Haworth Reference Press An Imprint of The Haworth Press, Inc. New York • London • Oxford

Published by

Food Products Press® and The Haworth Reference Press, imprints of The Haworth Press, Inc., 10 Alice Street, Binghamton, NY 13904-1580.

© 2003 by The Haworth Press, Inc. All rights reserved. No part of this work may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, microfilm, and recording, or by any information storage and retrieval system, without permission in writing from the publisher. Printed in the United States of America.

Cover design by Marylouise E. Doyle.

Library of Congress Cataloging-in-Publication Data

Handbook of formulas and software for plant geneticists and breeders / Manjit S. Kang, editor.

p. cm.

Includes bibliographical references (p.) and index.

ISBN 1-56022-948-9 (hard : alk. paper) - ISBN 1-56022-949-7 (soft)

1. Plant genetics—Statistical methods—Computer programs. 2. Plant breeding—Statistical methods —Computer programs. I. Kang, Manjit S.

QK981.5 .H36 2003 581.35'0285—dc21

2002072056