

TRANSGENIC PLANTS

Volume 2

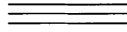
**PRESENT STATUS AND
SOCIAL AND ECONOMIC IMPACTS**

EDITED BY

**Shain-dow Kung
Ray Wu**

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Volume 2



Present Status and Social and Economic Impacts

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and Economic Impacts

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Academic Press, Inc.

Harcourt Brace Jovanovich, Publishers
San Diego New York Boston
London Sydney Tokyo Toronto

This book is printed on acid-free paper. ∞

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Academic Press, Inc.

1250 Sixth Avenue, San Diego, California 92101-4311

United Kingdom Edition published by

Academic Press Limited

24–28 Oval Road, London NW1 7DX

Library of Congress Cataloging-in-Publication Data

Transgenic plants / edited by Shain-dow Kung, Ray Wu.

p. cm.

Includes indexes.

Contents: v. 1. Engineering and utilization – v. 2. Present status and social and economic impacts.

ISBN 0-12-428781-6 (v. 1). – ISBN 0-12-428782-4 (v. 2)

1. Transgenic plants. 2. Crops—Genetic engineering. 3. Plant genetic engineering. I. Kung, Shain-dow. II. Wu, Ray.

SB123.57.T73 1992

631.5'23—dc20

92-11016

CIP

PRINTED IN THE UNITED STATES OF AMERICA

92 93 94 95 96 97 BB 9 8 7 6 5 4 3 2 1

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Preface

Biotechnology offers new ideas and techniques applicable to agriculture. It uses the conceptual framework and the technical approaches of molecular biology and plant cell culture systems to develop commercial processes and products. With the rapid development of biotechnology, agriculture has moved from a resource-based to a science-based industry. Indeed, plant breeding has been dramatically broadened by the introduction of genetic engineering techniques based on knowledge of gene structure and function. This has ushered agriculture into a new era where it joins ranks with the most sophisticated of biological sciences in using molecular and cell culture approaches that promise to yield a new generation of plants of almost any desirable trait. Biotechnology has taken us from the era of hybrid plants to the era of transgenic plants. We have advanced far beyond the “Green Revolution” to the “Gene Revolution.”

Since 1985, more than fifty species of transgenic plants have been engineered. However, reports on this work have been published in different journals and in various formats. We have attempted to harvest the first group of transgenic crops by assembling the important information in a two-volume work on “Transgenic Plants.” These volumes represent a significant milestone in plant/agricultural biology, promote the practical application of recombinant DNA technology, and assist in transforming the agricultural industry.

Reports on transgenic plants that have been engineered to date include the development of new techniques for transformation, basic study on a specific gene, and crop improvement for a specific cause. A number of publications on transgenic plants focus mainly on the development of efficient and reproducible methods for the transformation and regeneration of major crops. To date, the plants transformed have been predominantly dicot, particularly from the family Solanaceae, with only a few monocots and woody plants. Thus, the utilization of transgenic plants to improve agriculture is still in its infancy.

Volume 2 has been organized into three major parts. Part I covers transgenic monocotyledonous plants: rice, maize, and asparagus. Part II is directed to the transgenic dicotyledonous plants, including the most popular family of Solanaceae, legumes, oilseeds and vegetables, woody plants, cotton, and *Arabidopsis*. Part III focuses on the social and economic impacts of transgenic plants. In Volume 1, Engineering and Utilization, organized into three parts, Part I provides an overview of basic techniques for engineering transgenic plants. Part II presents selected examples of the value of transgenic plants to basic research. Part III includes some of the most significant contributions transgenic plants have made thus far to crop improvement, ranging from herbicide tolerance to the improvement of seed storage proteins. These volumes were designed so that they will be suitable for use in classrooms as well as in research laboratories.

We thank the authors for their valuable contributions. Their generosity, efforts, and patience are deeply appreciated. We also thank the staff of Academic Press for their help in making these volumes possible.

Shain-dow Kung
Ray Wu