

# Preface

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For over ten thousand years, humans have tried to control their food supplies through agriculture, moving from being hunter-gathers to selecting and improving wild species of plants and animals. Over most of this time, humans have been successful in maintaining their food supplies, due initially to improving agricultural techniques and more recently to the application of scientific advances in subjects such as genetics and agronomy. With rapidly increasing populations and major changes in climatic conditions, food supply and security will be an increasingly important problem.

The introduction of genetically modified (GM) crops has been a major technological advance to world agriculture over the last few decades. It has been shown that this technology has the potential to help increase world food production at a time of rapid change.

Genetically modified organism (GMO) regulation plays a critical role, not only in the commercialization of GM crops, but also in research and development. This book is aimed at people involved in GMO regulation in government and industry, biosafety professionals dealing with GMO releases, and also those researching, producing and handling GM crops, e.g., agronomists, plant biologists, and molecular biologists, especially in developing countries. It should also be of use in undergraduate and graduate courses on GM technology and to the general public who wish to be informed on the subject.

The book reviews current and future applications of GM technology, provides a background on GMO regulation, and critically analyses differences among different regulatory systems. The first chapter sets the scene by describing features of conventional crop breeding and production, the constraints on food production, the basics of GM technology, and the current and future applications of the technology. Because the aim of the book is risk assessment and management, the second chapter deals with the basics of risk assessment and risk management. The main body of the book is dedicated to reviewing assessment procedures concerning potential risks to human health (Chapter 3) and the environment from releases of GM plants (Chapter 4), with illustrative examples. The growth of GM technology has concerned the public and decision-making on GM releases not only involves the scientific assessment of potential risks, but also public perception of these factors – this is discussed

in Chapter 5. Chapter 6 describes the national and international regulatory structures that have been developed to handle this technology. Two of the Appendices (B and C) outline in detail the information that is required by many regulatory authorities for assessing proposed GM releases, and should provide guidance for new authorities who are developing their regulatory systems. Appendix D gives five case studies on releases which highlight specific issues.

Other features include:

- Baselines against which risk assessment is made;
- Grey areas in risk assessment procedures;
- Inputs into decision-making on GMO releases;
- How public perception of biotechnology impinges on GM regulation;
- The major international issues pertaining to GMO releases.

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