

Preface

Agriculture will remain the mainstay to feed the teeming millions in the years to come, which is indeed a tremendous and tough task. The untiring efforts and unflinching zeal of research scientists have transformed agricultural production from mere sustenance into commercial farming. An influx of technologies has transformed the very outlook of the farmers who look toward scientists for support in diverting their farming into profitable enterprises. Efficient weed management approaches are expected to contribute significantly in sustaining and increasing the profitability of agriculture. Advanced research in weed science provides knowledge to the weed science community in formulating research planning as well as developing guidelines for the farmers to save their crops from the menace of weeds.

Weed problems have turned into a continuing struggle for farmers on account of pressure to raise crops and increasing their productivity to meet the ever-growing demands of a fast-growing human population. As per the requirements of various crops, starting from hand weeding, weed control has gone through a number of changes with the advent of new technologies. Herbicide use is increasing globally as agriculture labor is becoming not only scarce, but also costly and not available at the right times. The growth of chemical weed control is attracting scientists and industries to work on herbicides that are eco-friendly and required in low doses. The new molecules that can be used in small quantities help in reducing the herbicide load in the environment, but may create some residue problems and pose high selection pressure. Research, therefore, is now focused on new methods of weed control, such as the use of cultural, biological, and biotechnological approaches that could be integrated with chemical weed control to reduce the herbicide load in the environment.

In this book, an attempt has been made to highlight the emerging weed management issues and to suggest measures to tackle these issues through advanced methods of weed control and better understanding of the ecology and biology of weeds. The authors of each chapter of this book were invited to contribute based on their experience and respective areas of expertise. To our knowledge, no book exists that summarizes the advanced methods of weed control to handle the emerging issues of weed science, and that too in the current changing scenario.

In this book, the thrust areas requiring immediate attention of weed scientists are covered: biology and ecology of weeds, new challenges in weed science and

research priorities, development of resistance to herbicides in weeds, control of aquatic and parasitic weeds, weed management in conservation agriculture, role of allelopathy in weed management, and integrated approaches for weed management in important crops. Through this book, the message has been given that to make an integrated weed management program a success, it would require improved information and technical assistance to growers in choosing correct methods for controlling the complexes of weeds. The main goal of this book is to provide comprehensive knowledge that will enable the weed scientists and policy makers—in careful planning, designing, and orientation of research and development of weed management—to ensure sustainability in agriculture. We expect that this book will provide sound guidelines for future weed management strategies to boost agricultural production by allowing the readers to benefit from the collective experience of others instead of learning through “the hard way.”

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