Biological Control of Rice Diseases

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Springer

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Preface

There is sufficient need to document all the available data on biological control of rice diseases in a small volume. Part of this need rests on the global importance of rice to human life. In the first chapter, I have tried to show that rice is indeed life for most people in Asia and shortages in production and availability can lead to a food crisis.

While rice is cultivated in most continents, biological disease management attains special relevance to rice farmers of Africa, Asia, and also perhaps, Latin America. These farmers are resource-poor and might not be able to afford the cost of expensive chemical treatments to control devastating rice pathogens such as *Magnaporthe oryzae* (blast), *Xanthomonas oryzae* pv. *oryzae* (bacterial leaf blight), *Rhizoctonia solani* (sheath blight) and the virus, rice tungro disease.

In an earlier volume that I developed under the title, Biological Control of Crop Diseases (Dekker/CRC Publishers, 2002), I included transgenic crops generated for the management of plant pathogens as biological control under the umbrella of a broad definition. Dr Jim Cook who wrote the Foreword for the volume lauded the inclusion of transgenic crops and induced systemic resistance (ISR) as a positive trend toward acceptance of host plant resistance as part of biocontrol. I continue to subscribe to this view.

This volume is small but presents adequate and important information on major rice diseases and research on biological control of rice diseases. If I presented the information on biological control alone, I feared that the reader will not get the whole picture. I do hope that this volume will be useful as a reference volume for all students and scientists in crop sciences and plant pathology.

More than two third of the work that is covered in this volume comes from research that was carried out in my laboratory at the University of Madras in southern India during 1980–2006 and the research group that was headed by Dr. T. W. Mew at the International Rice Research Institute (IRRI) in the Philippines. A number of Ph.D dissertations were prepared from the research that was carried out in my laboratory and the reader has a chance to come across these in literature cited under each chapter of the volume. As I prepared the volume I realized how fortunate I was

to have all these graduate students do doctoral research on biocontrol of different rice diseases and also felt thankful for the opportunities I have had to associate with Drs. Tom Mew and Swapan Datta at IRRI.

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My wife, Beulah Samuel, stood by me and encouraged me to prepare this volume.

I would like to thank the University of Madras, India who appointed me to a faculty position and afforded all the freedom to carry out rice research during 1978–2006 and Novozymes Biologicals in the United States who appointed me to an industry position in their R&D during 2006–2008.

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Chapter 1
Rice and Its Importance to Human Life

RICE is life, for most people living in Asia. Rice has shaped the cultures, diets and economies of thousands of millions of people. For more than half of humanity rice is life (Fig. 1.1). Considering its important position, the United Nations designated year 2004 as the International Year of Rice. Devoting a year to a commodity was unprecedented in United Nations history. However, the 57th session of the United Nations General Assembly noted that rice is the staple food of more than half the world's population, affirmed the need to heighten the awareness of the role of rice in alleviating poverty and malnutrition and reaffirmed the need to focus world attention on the role rice can play in providing food security and eradicating poverty and declared the year 2004 as the International Year of Rice (adopted on December16, 2002; www.fao.org/ag/irc).

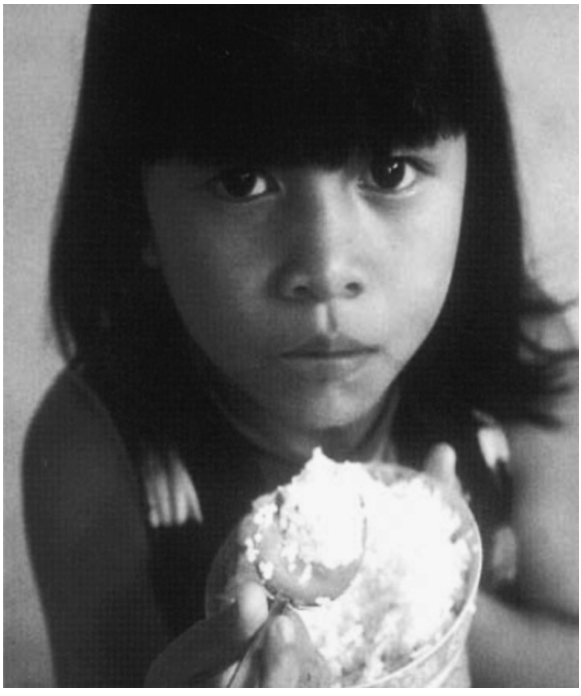

Fig. 1.1 A bowl of rice is life

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