the 32 Paradigm Shifts will not be accepted immediately, if at all, but they will engender some worthwhile discussion.

Rex N. Oram  
CSIRO Plant Industry,  
GPO Box 1600,  
Canberra, ACT, Australia 2601  
(r.oram@pi.csiro.au)

Agricultural Biotechnology in International Development.  

This book is the proceedings of a conference, “Biotechnology for a Better World” held in Asilomar Conference Center, Pacific Grove, CA, in April of 1997. The main sponsor and coordinator of the conference was a project, Agricultural Biotechnology for Sustainable Productivity, at Michigan State University.

The primary audience is those individuals involved and or interested in international plant biotechnology at all levels from program development, partnerships, research definition, implementation, safety, and intellectual property rights. An audience could include upper level undergraduates through those with an advanced degree. Having served on a board of an international center, I found the information regarding capacity building, modeling partnerships, and evaluation of the problems and challenges of developing sustainable research programs in foreign countries of Asia, Africa and South America to be excellent. This book should be recommended reading for individuals serving on international center boards, or working in international agricultural programs.

The book is divided into six major sections including (i) the needs and potential uses of agricultural biotechnology with perspectives of developing countries; (ii) the application of biotechnology to food security crops; (iii) the application of biotechnology to non-traditional crops; (iv) issues surrounding the development, transfer, adaptation, and utilization of agricultural biotechnology for emerging nations; (v) developing and accessing agricultural biotechnologies with international, U.S., developing country issues in perspectives and experiences; (vi) and a final part on how developing countries turn biotechnology into business by moving research into products.

There is a lot of valuable information within these sections that is critical to understand in developing international assistance programs in plant biotechnology with foreign countries. There are issues discussed including the concerns related to introduction of transgenic crops into their centers of origin, how to develop the capacity to do biotechnology, concerns regarding infrastructure development, and government commitment. There are excellent overviews on how collaborations between foreign governments and U.S. companies are structured, and constraints in regulatory and intellectual property fields. Examples of potato, sweet potato, rice, banana, date palm, cucurbits, and oil palm biotechnology integration with the traditional programs are evolving in different countries. Discussions on establishing priorities and how biotechnology can interface to improve crop productivity are very instructive.

Lupins as Crop Plants: Biology, Production and Utilization.  

Lupins as Crop Plants is the first comprehensive text on lupin as a crop. The book serves as a comprehensive reference and as a synthesis of most of the available literature on lupin. Although lupin species have been cultivated for thousands of years, only recently has this crop received the attention that it deserves. John Hamblin, in his preface, explains that the domestication of the three new species from one genus, lupin, in “such a short time is probably unique in the history of agriculture. What is even more remarkable is the fact that a further four species from the genus have since been domesticated or at least have all the domestication genes available and will be fully domesticated before the end of the millennium.” This text makes it very clear that much of the information in the book is derived from Australian experience. John Gladstones released the first variety, “Uniwhite”, in 1967 and production reached 1.4 million tonnes in 1995. This growth in production and interest is clearly the result of the great efforts that the Australians made in breeding, selection, and agronomy and other associated sciences. This text is organized into 15 chapters, and can be classified into four broad areas: genetics, selection, and breeding; physiology; agronomy and pathology; and economics and utilization.

The first chapter, written by J.S. Gladstones, provides a detailed discussion of the distribution, origin, taxonomy, history, and importance of Lupinus. This chapter serves as a good introduction to lupin domestication because there are a number of species that are agronomically important, and they have a distribution in the new world as well as important populations within the Mediterranean and elsewhere. The present natural distribution and habitats provide us with clues for behavioral traits observed within modern cultivars and provide insight to where important collections can be made.

The second chapter continues with a review of the genetic resources of Lupinus. This chapter focuses on the genetic stocks including mutants, selections, transgenic and interspecific types that are critical for lupin domestication and improvement. One of the things that makes studying lupins so interesting is that sweet cultivated lupins were “fully domesticated during the past sixty years and are genetically very close to their wild and land-race parents.” The chapter details the major collections and provides knowledge of the boundary conditions for specie adaptation. Included are data relating soil pH, altitude, rainfall, phenological data, alkaloid levels, yield components, and ranges for the species.

To further the discussion of lupin genetic resources, a chapter by C.A. Atkins et al. provides a concise and detailed review of the cyto-genetics of Lupinus. Topics include a comparison of genomes; attempts at interspecific hybridization, successes and failures; and strategies for overcoming barriers to interspecific hybridization. The chapter includes a summary of recent attempts using genetic transformation technology and recovery of transgenic plants. Attempts to confer resistance to virus and altering hormonal balance for yield improvement are documented.

W.A. Cowling, C. Huynhe, and W. Swiecicki follow this chapter with a discussion of Lupin breeding. The authors provide the historical background of lupin breeding during the early parts of the 20th century starting with von Sengbusch’s initial work with L. luteus, L. angustifolius, and his selections of low-alkaloid strains from L. albus during the early 1930s. They provide a description of the domestication and barriers