BOOK REVIEWS

Handbook of Industrial Crops

One of the main concerns of scientists is to document, assemble, share, and disseminate scientific and technical information of their own research findings, as well as that of other workers, in order to update literature and to speed technology transfer for public use. The revolution ushered in by the development and manufacturing of the hardware necessary for high speed computers, aided by the necessary software programs, and the easy access to information via the World Wide Web have greatly facilitated the exchange and spread of research findings. Electronic publishing has also accelerated the spread of knowledge and complemented the traditional paper-printing method. Another important development in the process of information assemblage and dissemination is the increasingly collaborative efforts among scientists to document, co-edit, and co-author proceedings and books that cover a wide range of topics. The Handbook of Industrial Crops is a good and successful example in the endeavor of enhancing the dissemination of scientific information and technology for the use of a wider audience.

The aim of the book is to assemble and bring together in one document the scattered and normally non-accessible information about a wide range of aspects of a group of industrial, perennial crops grown and produced by smallholders and in large plantations, mainly in tropical countries of Africa, Asia, and Latin America. These aspects include the probable centers of origin and domestication, centers of genetic diversity, history of evolution and adaptation, migration and distribution of germplasm within and across countries, botanical and taxonomical features, genetics and cytology, germplasm collection and conservation, selection and breeding, agronomic practices and management, industrial product processing and handling, economics and marketing, and trading systems.

The book consists of 12 chapters dealing with 12 major industrial crops that yield: edible oils from nuts, kernels, and fruits (e.g., arecanut, coconut, oil palm); beverages from seeds and leaves (e.g., coffee, tea, cocoa); chocolate and butter from seeds (e.g., cocoa); candy, sugar, syrup, and halva from sap, apocolen, haustorium, and kernels (e.g., palmyra); medicinal drugs from bark (e.g., cinchona, a source for the anti-malaria drug quinine); latex and natural rubber from bark (e.g., rubber); resins and tannins from bark (e.g., wattle); spices, flavors, and antioxidants from seeds (e.g., cardamom); nuts (e.g., cashew, coconut); masticatory nuts (e.g., arecanut), and timber (e.g., arecanut, coconut, palmyra). Each chapter is authored or co-authored by some eminent national authorities who have long been associated with the crops at various levels of activities. Research reported is clearly represented by the means of tables, figures, photographs, and illustrations with adequate references. Up-to-date statistics on the area of production, total production, yield, and export-import worldwide are presented. Future research prospects and possible new product development have been dealt with. Contact information for research centers and institutes and developmental organizations in various countries is given for some crops. Each chapter on a specific crop stands alone and represents a separate detailed account. The introduction is well-written and concise, giving an informative overview on the history of each crop that makes interesting reading by itself.

It is noteworthy that some of these crops are currently largely cultivated by both small farmers and in large plantations and are produced more in regions other than their centers of origin. For example, in the case of rubber, Hevea brasiliensis, which originated in the Amazon River basin in Brazil, over 90% of the world area of production and 93% of natural rubber tonnage occur in Asia with the largest percent production in Thailand (with 36% of world production), followed by Indonesia (with 22.4%), and Malaysia (with 12.3%). Concerning oil palm, Elaeis guineensis, which originated in the Guinea Coast of West Africa, over 80% of its oil is produced by two Asian countries: Malaysia with 13.4 million tons and Indonesia with 9.8 million tons in 2003. In the case of cocoa, Theobroma cacao, which is a native species of tropical humid forests of the Andes mountains in South America, 69% of total world production of cocoa beans occurs in Africa with the Ivory Coast having the highest share (42% of world production). Wattle, Acacia mearnsii, is a native species in the arid regions of eastern Australia, yet the main areas of production are in South Africa, Kenya, and Tanzania. Although cashew, Anacardium occidentale, is a native species of Brazil, almost half of the total world raw nut production in 2000 comes from India (0.520 million tons as compared to 0.180 million tons in Brazil). In the case of coffee, Coffea arabica and C. canephora, the origin is in Africa while the largest share of world production comes from Brazil, and in Colombia it represents the leading export crop. On the other hand, for tea, Camellia sinensis and C. assamica, which originated in Asia, the largest volume of production occurs in Asian countries with India, China, and Sri Lanka occupying the first, second, and third place, respectively. These trends in crop distribution and in volumes of production illustrate the importance of these industrial crops and their impact on the local economy of producing countries.

Environmental issues related to plantation agroecosystems such as soil erosion, soil fertility status, pollution, and carbon sequestration are of paramount importance (Lal, 2005). Soil erosion is a problem at the early stage of plantation establishment in the case of oil palm, cocoa, coffee, and tea where large areas of land are exposed to excessive rainfall that often occurs in the tropics (Hartemink, 2005). With improved crop and soil management (e.g., using cover crops, mulching, and intercropping), soil erosion could be minimized. Intercropping can further increase the economic return from industrial crop plantations by producing more than one crop on the same land area, as is done in tree-crop cropping systems. In the long-term, however, soil erosion is much less under plantation agroecosystems, because of better soil protection by closed tree and shrub canopies all the year, than in annual crops. Modelling of plantation agroecosystems, based on field research,