

PREFACE

As we enter the twenty-first century, plant science is once again assuming a prominent role in research. Renewed emphasis on developing medicinal products from native plants has encouraged ethnobotanical endeavors. The destruction of the rain forests has made the timing for this research imperative and has spurred efforts to catalog the plant biodiversity in these environments. Efforts to feed the growing populations in developing nations have also positioned plant scientists at the cutting edge of genetic engineering with the creation of transgenic crops. However, in recent decades botany courses have seen a decline in enrollment, and some courses have even disappeared from the curriculum in many universities. We have written *Plants and Society* in an effort to offset this trend. By taking a multidisciplinary approach to studying the relationship between plants and people, we hope to stimulate interest in plant science and encourage students to further study. Also, by exposing students to society's historical connection to plants, we hope to instill a greater appreciation for the botanical world.

AUDIENCE

Recently, general botany courses have emphasized the impact of plants on society. In addition, many institutions have developed plants and society courses devoted exclusively to this topic. This emphasis has transformed the traditional Economic Botany from a dry statistical treatment of "bushels per acre" to an exciting discussion of "botanical marvels" that have influenced our past and will change our future. *Plants and Society* is intended for use in this type of course, which is usually one semester or one quarter in length. There are no prerequisites, because it is an introductory course. The course covers basic principles of botany and places a strong emphasis on the economic aspects and social implications of plants and fungi.

Students usually take a course of this nature in their freshman or sophomore year to satisfy a science requirement in the general education curriculum. Typically, they are not biology majors. Although most students enroll to satisfy the science requirement, many become enthusiastic about the subject matter. Students, even those with a limited science background, should not encounter any problems with the level of scientific detail in this text.

As indicated, the primary market for this text would be a plants and society course; however, it would certainly be suitable for an introductory general botany course as well.

ORGANIZATION

We feel that *Plants and Society* is a textbook with a great deal of flexibility for course design. It offers a unique balanced approach between basic botany and the applied or economic aspects of plant science. Other texts emphasize either the basic or applied material, making it difficult for instructors who wish to provide better balance in an introductory course. Another distinctive feature is the unit on algae and fungi. While other texts cover certain aspects of this topic, we have an expanded coverage of algae and fungi and their impact on society.

Plants and Society is organized into 26 chapters that are grouped into seven units. The first nine chapters cover the basic botany found in an introductory course. However, even in these chapters we have included many applied topics; some in the boxed essays but others directly in the chapter text.

Unit I—Plants and Society: The Botanical Connections to Our Lives. Chapter 1 stresses the overall importance of plants in everyday life. The properties of life and an introduction to chemistry are included. Flowering and non-flowering plants, algae, and fungi are introduced. The diversity and applications of phytochemicals is also presented.

Unit II—Introduction to Plant Life: Botanical Principles. This unit addresses basic botany. Chapters cover plant structure from the cellular level through the mature plant. Reproduction, including mitosis and meiosis and the life cycle of flowering plants, is discussed in a separate chapter. Other chapters cover genetics, evolution, plant physiology, plant systematics, and plant diversity. Some of the economic aspects of plants discussed in this unit are the importance of vegetables and fruits, the connection between sugar and slavery, plant essential oils and perfumes, phytoremediation, the applications of palynology, and species conservation.

Unit III—Plants As a Source of Food. This unit describes the major food crops. It begins with a chapter on the requirements for human nutrition and continues with a chapter on the origin of agriculture. Other chapters cover the grasses, the legumes, and starchy staples. The unit ends with a chapter on the Green Revolution, the loss of genetic diversity, the search for alternative crops, and the controversial development of transgenic crops.