

Preface

Approximately 10,000 years ago, humans began to engage in arable farming and, thus, to fundamentally modify parts of the natural landscape in a variety of vegetation zones around the world. The crop and livestock-production areas established since then are ecological systems with their own characteristics, because of regular human intervention. In total, these areas make up agroecosystems, whose structure and function are directed and affected by humans on the one hand but are, nevertheless, shaped by natural factors on the other.

This book deals with the patterns and processes of agroecosystems. It also tries to take a holistic view of the ecological relationships apparent from the interactions within agroecosystems—the agricultural activities of humans and their feedback in the natural world. Global aspects are considered throughout, because agriculture is a major cause of change in ecological systems and processes at different scales. The book's scope therefore covers agroecosystems of different regions and climate zones and the spatial and temporal dimensions of agriculture that affect ecological cycles, the environment, and the Earth's climate.

Finally, it is also our objective to illustrate the relationships between ecology as a basic science and the applied and production-oriented disciplines of agricultural science, for example crop production, plant protection, and livestock farming. It starts with the biotic and abiotic effects to which all species and their interactions in both natural and agricultural systems are subject. This involves examination not only of single factors but also their diverse direct and indirect effects on different system components. Building on ecological foundations, methods of managing and controlling agroecosystems to secure and increase production are discussed. These include such management measures as fertilization, irrigation, soil cultivation, selection of cultivated crop and livestock species, and management of pests, weeds and diseases. Such intervention also affects the environment. Not only does it affect natural habitats, their communities, and the global climate, it also affects the livelihoods of the growing human population in different ways.

With its interdisciplinary approach, this book is primarily directed at students of the agricultural sciences, biology, agro-biology, horticulture, and geography; it also provides relevant background information for interdisciplinary sciences, for

example geoecology and landscape ecology, landscape management, and planning. The book also provides compact information for teachers and lecturers of different levels.

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