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Crop Production in India

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It is rarely that one finds a book on the subject of agriculture of such broad scope, fascinating interest, and so full of the applications of ecology and physiology as Howard's "Crop-production in India." In every chapter numerous problems of plant growth in relation to environment are brought before the reader in such a stimulating manner that one can scarcely conclude

[1] Howard, Albert. "Crop-production in India. A Critical Survey of its Problems." 200 pp. Oxford University Press, London, 1924.

but that ecology will reach its greatest usefulness in the field of general agriculture. It is a book to which every student of environment should have ready access.

We learn from the preface that "Agriculture is and for many years to come must remain India's greatest industry and the foundation of the State. . . . For the last twenty years a number of men of science have been engaged in exploring the various directions in which the produce of the soil of India can be increased and improved. . . . Many improvements in crop-production have been devised which are well within the means of the people. . . . The lessons learned at the Experiment Stations have been brought rapidly and successfully to the fields of the cultivators. . . . The investigations in progress have brought to light a number of problems, the successful solution of which must be accomplished before further advances can be made." The chief aim of the book is to state these problems in simple language and thereby enlist the interest of the people. From the nature and magnitude of the work, the problems can be adequately attacked only if the active cooperation of the public is secured. A subsidiary purpose is to stimulate further work and to attract a number of active and enthusiastic investigators to these problems. Howard feels that both these objects will have to be attained before the immense potentialities of the soil of India can be developed.

The book is divided into three parts; the soil, the crop, and the organization of research. Under the first head problems of surface drainage and erosion, soil-aeration, irrigation and water-saving, and of nitrogen and alkali are discussed. In the several brief chapters, one on each of these topics, the plant is kept foremost as the center of the subject, and various soil factors have been considered in relation to the welfare of the crop. Chief attention is given to soils as a source of sufficient water, air and organic matter for the crop, and to soil structure. If these environmental factors are made favorable, abundant crops can be produced, for the soils of India are exceedingly fertile. Numerous problems are discussed and adequately illustrated. Among these are the regulation of the rainfall after it reaches the soil; control of drainage waters; aerating the soil and increasing both quality and quantity of yield; the regulation of run-off and the utilization of surplus water; reducing the amount of water used and the number of irrigations with resultant increased yields; reducing nitrogen losses and increasing the nitrogen supply; and the alkali problem especially in connection with irrigation.

"India is a land of small-holders devoted to the raising of crops. These are of two kinds. First in area and importance are the food crops—the cereals and pulses which feed the population. The second group comprises the money crops, by which the cultivator pays the land revenue and purchases the necessaries of life. The surplus produce, which remains after the needs of the country are satisfied, is exported."

"The field of work in the improvement of crops in India is immense. More efficient varieties are needed to replace those now cultivated. More intensive methods of agriculture, within the means of the people, have to be devised. . . . Progress has been made in both these directions. Such advances, however, must of necessity be slow, as they have to proceed from the basis of small holdings cultivated by a peasantry for the most part in debt"

The section on the crop is opened by a concise statement of the economic significance of root-development. It is repeatedly emphasized that the most important agent in crop production is the plant itself, that improvements in the soil are subsidiary in the sense that they are undertaken with the sole object of increasing the activities of crops and getting more work done by the plant. "The roots are the means by which soil and plant are brought into gear. The more the nature and extent of this gearing are examined, the more important and significant it becomes." Some striking examples of the actual application of the above principle to crop production and the results in quality and quantity of yields are vividly portrayed.

Chapters on the improvement of varieties, distribution of seed, aspects of the fodder problem, fruit-growing, and disease in plants, follow. Each of the chief crops of India, viz., cotton, wheat, rice, sugar-cane, fibers, oil-seeds, tobacco, and pulses are discussed in a manner most significant to the ecologist and physiologist.

In the last part some ideas as to the type of investigator needed for the problems underlying crop-production and on the organization of scientific work have been put forward. These are chapters especially valuable for the investigator in training and for the administrator.

The book is written in a concise, straightforward manner and clearly indicates the vast field of work in India still untouched. In so doing, it makes use of past experience in pointing the way to future investigations. A short bibliography, appended to each chapter, enables the student to explore in greater detail the various subjects considered.

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