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Eighth Edition

Plants & Society

Mc Graw Hill Education

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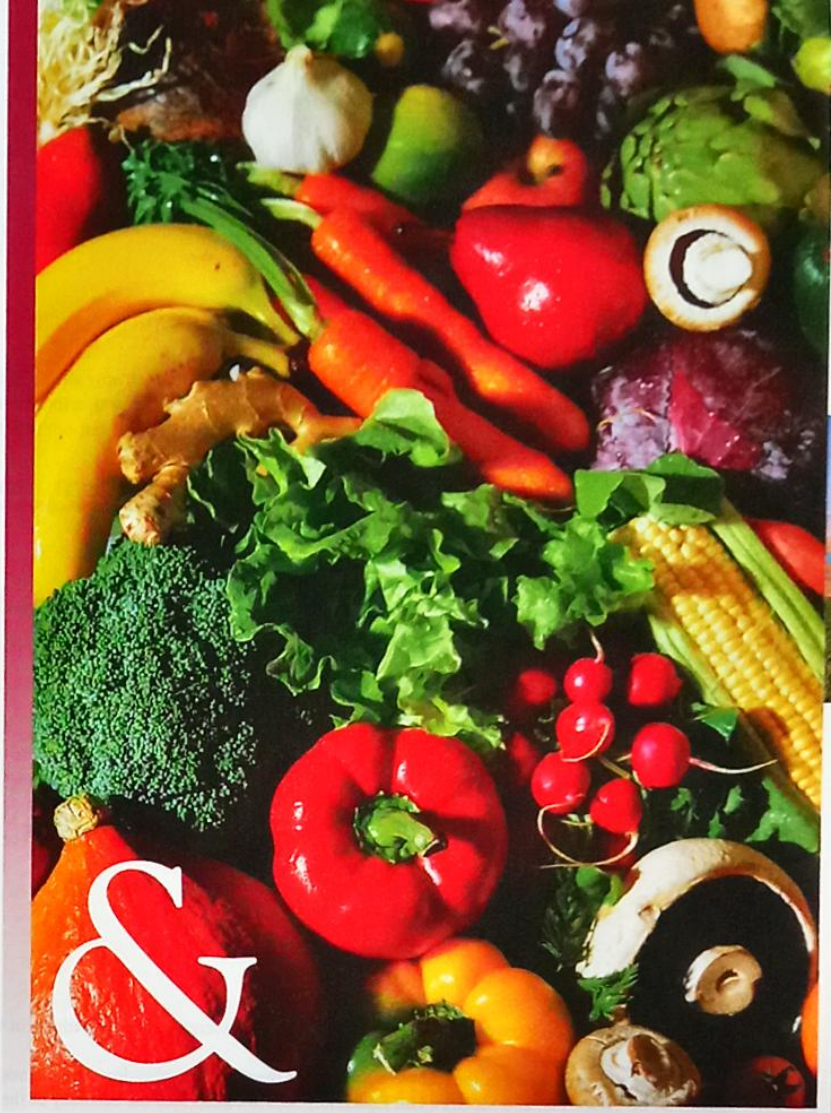

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PLANTS AND SOCIETY

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 LWI 24 23 22 21 20 19

ISBN 978-1-260-08511-2
MHID 1-260-08511-2

Cover Image: © *Rodrigo A Torres/Glow Images*

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Contents in Brief

Contents

Rice, wheat, and corn are members of the grass family, the Poaceae, which is of greater importance to humanity than any other plant family. The grains produced by these three plants are the most extensively grown food crops worldwide. Rice, *Oryza sativa*, is one of the oldest cultivated crops and is currently the dietary staple for approximately 3 billion people. The earliest evidence of rice cultivation comes from China; however, many other regions in Asia also show evidence of early rice farming. Another species of rice, *O. glaberrima*, was domesticated in Africa much later and is not as widely grown as *O. sativa*.

Oryza sativa is a multistalked herbaceous annual, which grows to about one meter in height. At maturity, each stalk is terminated by inflorescence bearing grains, which are surrounded by bracts. The bracts, often called chaff, are removed during threshing. The farmers shown in the cover photo are using a traditional wooden thresher to separate rice grains from the bracts and stalks.

There are thousands of rice varieties. Some varieties are based on methods of cultivation, while other categories are based on the characteristics of the grains. These can be grouped into two major subspecies: *indica* and *japonica*. *Indica* varieties are primarily grown in tropical areas and have long grains that are nonsticky when cooked. By contrast, *Japonica* varieties have short grains that are sticky when cooked and are grown in cooler regions of subtropical areas as well as in temperate areas. Although rice can be grown on land like other crops, it is traditionally grown in flooded fields or paddies with 5 to 10 cm of standing water during most of the growing season. When the grain is ready to harvest, the fields are drained. Rice grown in paddies is also called lowland rice to distinguish it from upland rice, which is grown without flooding.

In July 2018, the world population was estimated at 7.6 billion; however, over 800 million people (10% of the population) have insufficient food to meet their daily nutritional requirements. World population is projected to reach 9.7 billion in 2050 and continue to grow for the remainder of the century. To feed the 2 billion people who will be added in the next 30 years, world food production will need to increase significantly. Higher yields, disease resistance, and nutritionally improved crops including rice will be at the forefront of these efforts to feed a hungry world. Golden rice, enriched with beta-carotene to help relieve vitamin A deficiency, and bacterial blight-resistant rice are two examples of genetic improvements that are being developed. Advances in molecular biology, including the genome sequencing of important crop plants, will be instrumental in crop improvements.

The value of rice as a food crop is just one of the many ways in which people throughout the world are dependent on plants. *Plants and Society* explores many plants that have made an impact on civilization, including food crops, beverage plants, herbs and spices, fibers, wood, medicinal plants, algae, and fungi. The influence of these organisms on societies throughout the world is truly remarkable.

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EAN 9 781260 085112 90000
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