

GRAIN FARMING

Learning Outcome 10.3.8

Describe how grain and Mediterranean farming work.

Some form of grain is the major crop on most farms. Grain is the seed from various grasses, such as wheat, corn, oats, barley, rice, millet, and others. Commercial grain agriculture is distinguished from mixed crop and livestock farming because crops on a grain farm are grown primarily for consumption by humans rather than by livestock. Farms in developing countries also grow crops for human consumption, but the output is directly consumed by the farmers. Commercial grain farms sell their output to manufacturers of food products, such as breakfast cereals and breads.

The most important crop grown is wheat, used to make bread flour. Wheat generally can be sold for a higher price than other grains, such as rye, oats, and barley, and it has more uses as human food. It can be stored relatively easily without spoiling and can be transported a long distance. Because wheat has a relatively high value per unit weight, it can be shipped profitably from remote farms to markets.

As was the case with milk production, the share of world production of wheat in developing countries has increased rapidly. Much of this increased production results from growth in large-scale commercial agriculture. Developing countries accounted for more than one-half of world wheat production in 2010, compared to only one-fourth in 1960. The United States is by far the largest producer of wheat among developed countries, but it now ranks third among all countries, behind China and India (Figure 10-40). China has been the world leader since 1983, and India has been second since 1999.

Large-scale grain production, like other commercial farming ventures in developed countries, is heavily mechanized, conducted on large farms, and oriented to consumer preferences. The McCormick reaper (a machine that

cuts grain standing in the field), invented in the 1830s, first permitted large-scale wheat production. Today the combine machine performs in one operation the three tasks of reaping, threshing, and cleaning.

Unlike work on a mixed crop and livestock farm, the effort required to grow wheat is not uniform throughout the year. Some individuals or firms may therefore have two sets of fields—one in the spring wheat belt and one in the winter wheat belt. Because the planting and harvesting in the two regions occur at different times of the year, the workload can be distributed throughout the year. In addition, the same machinery can be used in the two regions, thus spreading the cost of the expensive equipment. Combine harvesting contractors start working in Oklahoma in early summer and work their way northward.

Commercial grain farms are generally located in regions that are too dry for mixed crop and livestock agriculture. Within North America, large-scale grain production is concentrated in three areas:

- The winter wheat belt through Kansas, Colorado, and Oklahoma. The winter wheat crop is planted in the autumn and develops a strong root system before growth stops for the winter. The wheat survives the winter, especially if it is insulated beneath a snow blanket, and is ripe by the beginning of summer.
- The spring wheat belt through the Dakotas, Montana, and southern Saskatchewan in Canada. Winters are usually too severe for winter wheat in this region, so spring wheat is planted in the spring and harvested in the late summer.
- The Palouse region of Washington State. Wheat comprises a smaller percentage of agricultural output than in the other two wheat-growing regions. The Palouse is also an important source of legumes; for example, 80 percent of U.S. lentils are grown in the region.

Wheat's significance extends beyond the amount of land or number of people involved in growing it. Unlike other agricultural products, wheat is grown to a

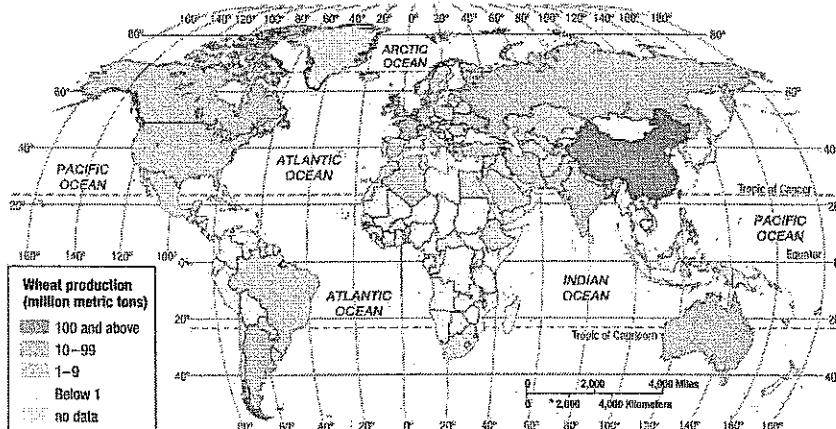
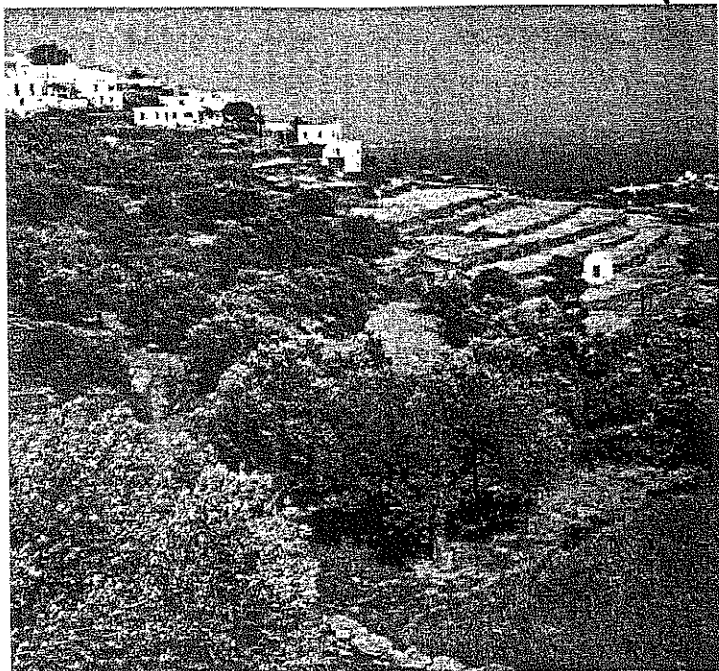


FIGURE 10-40 WHEAT PRODUCTION
China and India are the leading wheat producers, followed by the United States.

Group 3/4



▲ FIGURE 10-41 MEDITERRANEAN AGRICULTURE Nearly all olives are produced in countries that border the Mediterranean Sea or have similar climates, including Sifnos, Greece.

considerable extent for international trade, and it is the world's leading export crop. The United States and Canada account for about half of the world's wheat exports; consequently, the North American prairies are accurately called the world's "breadbasket." The ability to provide food for many people elsewhere in the world is a major source of economic and political strength for these two countries.

MEDITERRANEAN AGRICULTURE

Mediterranean agriculture exists primarily on the lands that border the Mediterranean Sea in Southern Europe, North Africa, and western Asia (Figure 10-41). Farmers in California, central Chile, the southwestern part of South Africa, and southwestern Australia practice Mediterranean agriculture as well.

These Mediterranean areas share a similar physical environment (refer to Figures 10-18 and 10-40). Every Mediterranean area borders a sea, and most are on west coasts of continents (except for some lands surrounding the Mediterranean Sea). Prevailing sea winds provide moisture and moderate the winter temperatures. Summers are hot and dry, but sea breezes provide some relief. The land is very hilly, and mountains frequently plunge directly to the sea, leaving very narrow strips of flat land along the coast.

Farmers derive a smaller percentage of income from animal products in the Mediterranean region than in the mixed crop and livestock region. Livestock production is hindered during the summer by the lack of water and good grazing land. Some farmers living along the Mediterranean

Sea traditionally used transhumance to raise animals, although the practice is now less common. Under transhumance, animals—primarily sheep and goats—are kept on the coastal plains in the winter and transferred to the hills in the summer.

Most crops in Mediterranean lands are grown for human consumption rather than for animal feed. **Horticulture**—which is the growing of fruits, vegetables, and flowers—and tree crops form the commercial base of Mediterranean farming. A combination of local physical and cultural characteristics determines which crops are grown in each area. The hilly landscape encourages farmers to plant a variety of crops within one farming area.

In the lands bordering the Mediterranean Sea, the two most important cash crops are olives and grapes. Two-thirds of the world's wine is produced in countries that border the Mediterranean, especially Italy, France, and Spain. Mediterranean agricultural regions elsewhere in the world produce most of the remaining one-third (refer to Figure 4-22). The lands near the Mediterranean Sea are also responsible for a large percentage of the world's supply of olives, an important source of cooking oil. Despite the importance of olives and grapes to commercial farms bordering the Mediterranean Sea, approximately half of the land is devoted to growing cereals, especially wheat for pasta and bread. As in the U.S. winter wheat belt, the seeds are sown in the fall and harvested in early summer. After cultivation, cash crops are planted on some of the land, and the remainder of the land is left fallow for a year or two to conserve moisture in the soil.

Cereals occupy a much lower percentage of the cultivated land in California than in other Mediterranean climates. Instead, a large portion of California farmland is devoted to fruit and vegetable horticulture, which supplies a large portion of the citrus fruits, tree nuts, and deciduous fruits consumed in the United States. Horticulture is practiced in other Mediterranean climates, but not to the extent found in California. The rapid growth of urban areas in California, especially Los Angeles, has converted high-quality agricultural land into housing developments. Thus far, the loss of farmland has been offset by the expansion of agriculture into arid lands. However, farming in drylands requires massive irrigation to provide water. In the future, California agriculture may face stiffer competition for the Southwest's increasingly scarce water supply.

Pause and Reflect 10.3.8

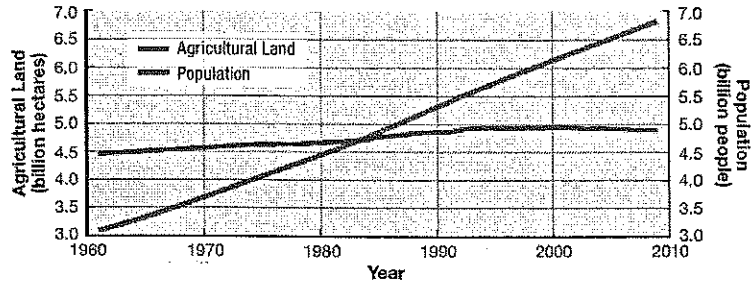
At least 1 million metric tons of wine are produced in eight countries (Argentina, Australia, China, France, Italy, South Africa, Spain, and the United States). Referring to Figures 4-22 and 10-18, which one of the eight countries does not appear to have Mediterranean agriculture?

group 3
stop
*
group 4
start

Two centuries ago, people believed that good agricultural land would always be available for willing pioneers. Today few scientists believe that further expansion of agricultural land can feed the growing world population. At first glance, new agricultural land appears to be available because only 11 percent of the world's land area is currently cultivated. However, in recent decades, population has increased much more rapidly than agricultural land (Figure 10-55).

In some regions, farmland is abandoned for lack of water. Especially in semiarid regions, human actions are causing land to deteriorate to a desertlike condition, a process called **desertification** (or, more precisely, semiarid land degradation). Semiarid lands that can support only a handful of pastoral nomads are overused because of rapid population growth. Excessive crop planting, animal grazing, and tree cutting exhaust the soil's nutrients and preclude agriculture. The Earth Policy Institute estimates that 2 billion hectares (5 million acres) of land have been degraded around the world (Figure 10-56). Overgrazing is thought to be responsible for 34 percent of the total, deforestation for 30 percent, and agricultural use for 28 percent. The UN estimates that desertification removes 27 million hectares (70 million acres) of land from agricultural production each year, an area roughly equivalent to Colorado.

Excessive water threatens other agricultural areas, especially drier lands that receive water from human-built irrigation systems. If the irrigated land has inadequate drainage, the underground water level rises to the point where roots become waterlogged. The UN estimates that 10 percent of all irrigated land is waterlogged, mostly in Asia and South America. If the water is salty, it can damage plants. The ancient civilization of Mesopotamia may have collapsed in part because of waterlogging and excessive salinity in its agricultural lands near the Tigris and Euphrates rivers.

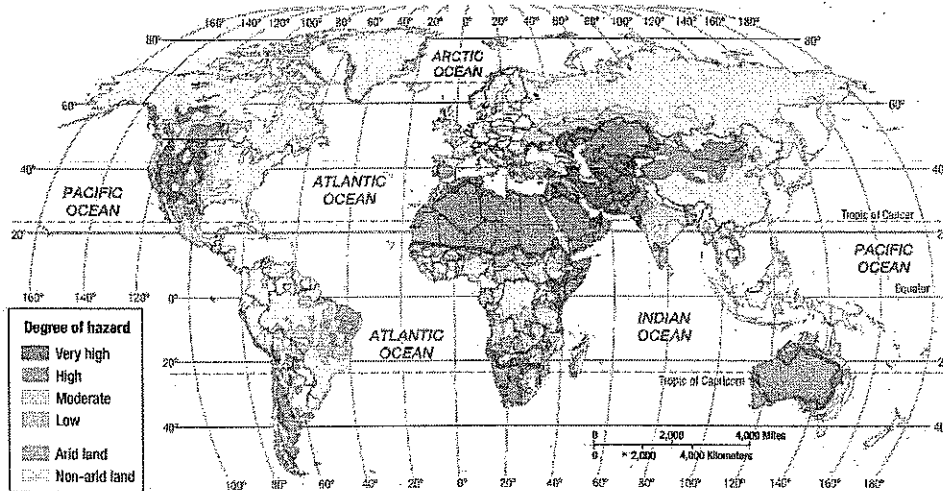


▲ FIGURE 10-55 AGRICULTURAL LAND AND POPULATION GROWTH Land devoted to agriculture has remained virtually unchanged since 1990, whereas population has increased by more than 50 percent.

Urbanization can also contribute to reducing agricultural land. As urban areas grow in population and land area, farms on the periphery are replaced by homes, roads, shops, and other urban land uses. In North America, farms outside urban areas are left idle until the speculators who own them can sell them at a profit to builders and developers, who convert the land to urban uses. A serious problem in the United States has been the loss of 200,000 hectares (500,000 acres) of the most productive farmland, known as **prime agricultural land**, as urban areas sprawl into the surrounding countryside (see the Contemporary Geographic Tools feature).

Pause and Reflect 10.4.4

By itself, GIS can't rank the relative importance of the various factors in protecting farmland. Policymakers and the public must make these value judgments. Do you think that prime soils, significant environmental features, and high population growth should be valued the same or differently in deciding which farmland to protect?



◀ FIGURE 10-56 DESERTIFICATION (SEMIARID LAND DEGRADATION)

The most severe problems are in northern Africa, central Australia, and the southwestern parts of Africa, Asia, North America, and South America.