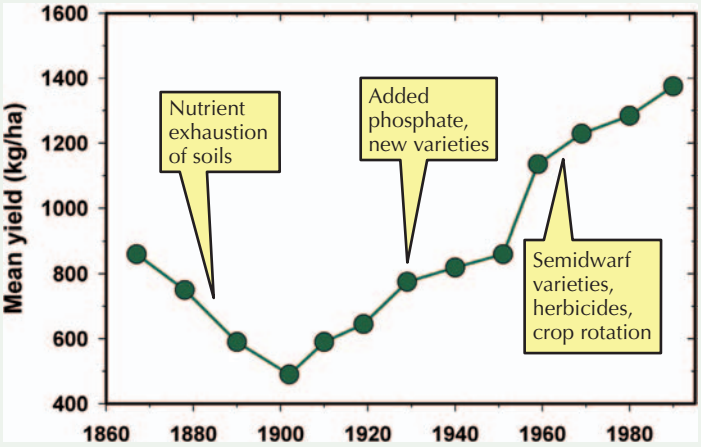
Chapter 15

ECOSYSTEM ECOLOGY—ENERGY FLOWS AND PRODUCTION

IN THE NEWS

Production of crops is one of the most practical applications of agricultural ecosystem ecology, and the history of crop improvements gives a graphic illustration of the factors that can limit plant production. The essence of farming is to simplify the ecosystem so that the production of a crop can be maximized. Wheat is a good example because it is one of the staple crops of many countries in the world. Australia is one of the major wheat producers in the world, and the history of wheat production in Australia mirrors what has happened in North America and Europe over the last 150 years.

The average yield of wheat in Australia went through an initial decline from about 1850 to 1900 because of soil nutrient exhaustion. Input must equal output for nutrients in the soil to remain constant, and crop production continually removes nutrients in the wheat that is harvested for human use. By about 1900 wheat yield was only one-half what it had been 50 years earlier, and much early research was directed to improving wheat yields. The most important nutrient for many Australian soils was phosphorous, and around 1900 farmers began fertilizing their fields with superphosphate. At the same time new genetic varieties of wheat were developed that were more suited to the temperature



Mean wheat yield in Australia from 1860 to the mid 1990s