The Agricultural Revolutions

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The First Agricultural Revolution:

Geographer Carl Sauer believed the experiments necessary to establish agriculture and settle in one place would occur in lands of plenty. Only in a land of plenty could people afford to experiment with raising plants and breed them for domestication. Plant domestication may have originated from Southeast and South Asia (and later in South America) more than 14,000 years ago with the domestication of tropical plants. In Asia, the combination of human settlements, forest margins, and fresh water streams may have given rise to the earliest planned cultivation of root crops—crops that are reproduced by cultivating either the roots or cuttings from plants.

In the first agricultural revolution, shifting cultivation was a common method of farming. One specific kind of shifting cultivation is slash-and-burn agriculture (also called milpa agriculture and patch agriculture). It consisted of the controlled use of fire in places. Trees are cut down and all existing vegetation is burned off. In slash-and-burn, farmers use tools (machetes and knives) to slash down trees and tall vegetation, and then burn the vegetation on the ground. A layer of ash from the fire settles on the ground and contributes to the soil's fertility. Shifting cultivation conserves both forest and soil: its harvests are substantial given the environmental limitations, and it requires a lot of organization. Shifting cultivation uses substantially little energy and has been a sustained method of farming for thousands of groups. It gave ancient farmers opportunities to experiment with various plants, to learn the effects of weeding and crop care, to cope with environmental vagaries, and to discern the decreased fertility of soil after sustained farming.

Subsistence farming is becoming marginalized. Ever since colonialism (1500-1950), subsistence land use is giving way to more intensive farming and cash (or luxury) cropping. In the process, societies from South America to Southeast Asia are being profoundly affected. Land that was once held communally is being parceled out to individuals for cash cropping. The system that ensured an equitable distribution of wealth has become stratified, with poor people at the bottom and rich landowners at the top.

The Second Agricultural Revolution:

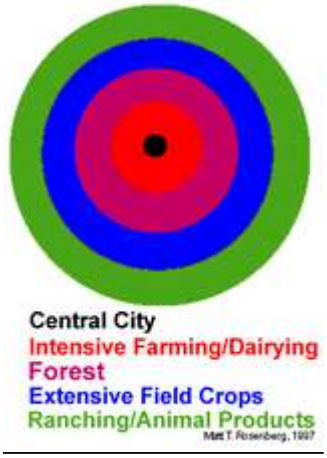
The second agricultural revolution coincided with the Industrial Revolution; it was a revolution that would move agriculture beyond subsistence to generate the kinds of surpluses needed to feed thousands of people working in factories instead of in agricultural fields. The second agricultural revolution was composed of a series of innovations, improvements, and techniques in Great Britain, the Netherlands, Denmark, and other neighboring countries.
By the 17th and 18th centuries, new crops came into Europe from trade with the Americas, including corn and potatoes. The governments of Europe played a role in spurring on the second agricultural revolution by passing laws such as Great

Britain's Enclosure Act that encouraged consolidation of fields into large, single-owner holdings. Farmers increase the size of their farms, piecing together more contiguous parcels of land, fenced in land, and instituted field rotation. Methods of soil preparation, fertilization, crop care, and harvesting improved.

New technologies such as the seed drill enabled farmers to avoid wasting seeds and to easily plant in rows, making it simpler to distinguish weeds from crops. Advances in breeding livestock enabled farmers to develop new breeds that were either strong milk producers or good for beef. By the 1830s, farmers were using new fertilizers on crops and feeding artificial feeds to livestock. Increased agricultural output made it possible to feed much larger urban populations, enabling the growth of a secondary (industrial) economy.

Innovations in machinery that occurred with the Industrial Revolution in the late 1800s and early 1900s helped sustain the second agricultural revolution. The railroad helped move agriculture into new regions, such as the United States Great Plains. Geographer John Hudson traced the major role railroads and agriculture played in changing the landscape of that region from open prairie to individual farmsteads. Later, the internal combustible engine made possible the mechanization of machinery and the invention of tractors, combines, and a multitude of large farm equipment. New banking and lending practices helped farmers afford the new equipment.

- In the 1800s, Johann Heinrich von Thünen (1983-1850) experienced the second agricultural revolution firsthand —because of which he developed his model (the Von Thünen Model), which is often described as the first effort to analyze the spatial character of economic activity.



- Also, geographer Lee Liu studied the spatial pattern of agricultural production in one province of China, giving careful consideration to the intensity of the production methods and the amount of land degradation.

The Third Agricultural Revolution (also called the Green Revolution):

The Green Revolution was a period in time when new agricultural practices were created to help farmers all over the world. It was an international effort that was planned to eliminate hunger by improving crop performances. This plan provided new practices that allowed farmers to produce more of the same product within the same amount of land. This meant that the farmers could get more out of their land than they used to. This rapid diffusion of more productive agriculture techniques occurred throughout the 1970s and the 1980s. The plan had two main practices: the introduction of newer higher-yield seeds and the expanded use of fertilizers. This would lead to the increase of the agricultural productivity at a global scale, which increased faster than population growth. The Green Revolution answered questions from experts about massive global famine.

The Green Revolution has strong cases on why it is a success and a failure. The Green Revolution allowed scientists to create higher-yield hybrids that are adapted to environmental conditions in specific regions. This allowed scientists to predict the maximum annual crop yield in Asia and Latin America, which was about 6,000 kilograms per hectare. The Green Revolution was largely responsible for preventing a food crisis in these regions during the 1970s and 1980s. But the Green Revolution has not proven itself to be a successful strategy in ending world hunger. The question

of famine is not that we need more food, but how we distribute it within the world. The Green Revolution does not alter the distribution of economic power—more specifically purchasing land and purchasing power. Redistributing power and distributing food to those who need it can only solve world hunger. So if poor people do not have the money to buy food, then increase in production of food is not going to help them. Some other problems of the Green Revolution are that there have been problems with production after a dramatic increase in technological production. After dramatic increases in the early stages of production, yields have been falling in a number of Green Revolution areas. In Central Luzon, Philippines, rice yields grew steadily during the 1970s, peaked in the early 1980s, and have been gradually dropping ever since. The International Rice Research Institute (IRRI) in both Central Luzon and Laguna Province conducted long-term experiments that confirm these results. Similar patterns have been observed for rice-wheat systems in India and Nepal. The causes of this problem have to do with forms of long-term soil degradation and are still poorly understood by scientists.

An example of the Green Revolution on a global scale would be India's wheat production. After only importing 10 million tons of wheat annually from 1964 to 1965, India had, by 1971, a surplus of wheat by several million tons. India's wheat production had more than doubled in five years during the Green Revolution. The Green Revolution allowed India to have extra food because its land had grown more food than before.

Also, an entire field of biotechnology has sprung up in conjunction with the third agricultural revolution, and the development of genetically engineered crops (GE) or genetically modified organisms (GMOs) is its principal orientation. Since the origin of agriculture, people have experimented with hybrid crops and cross-breeding of animals. Today, genetically modified organisms are found in 75% of all processed foods in the United States. The United States leads the world in production of genetically engineered crops, with 38% of all acres in corn and 80% of all acres in soybeans in the U.S. sown with genetically engineered seeds. Some regions have either banned or embraced genetically engineered crops. Many of the poorer countries of the world do not have access to the necessary capital and technology. Moreover, ideological resistance to genetically engineered foods is strong in some places—especially in Western Europe where GMOs have been declared safe but there is a strong aversion to its taste and how it may affect one's health. Such concerns have spread to less affluent parts of the world as well. In many poorer regions, seeds are a cultural commodity, reflecting agricultural lessons learned over generations. In these regions, many resist the invasion of foreign, genetically engineered crops.

In a Nutshell…

-The First Agricultural Revolution
*Simple farming with cultivation, subsistence and sustainable farming, and shifting cultivation.
*Goes along with the first cities (first urban revolution)
-The Second Agricultural Revolution
*Coincided with the Industrial Revolution
*Farming became mechanized and commercial with the development of new inventions and technology (tractor, seed drill)
*Goes along with the second stage of the demographic transition
*Goes along with the second urban revolution (massive expansion of cities and urban societies)
-The Third Agricultural Revolution

*More advanced technology is used for farming and to increase farming yields and/or outputs from the same amount of land—efficient use of land
*Development of genetically engineered crops (GE) or genetically modified organisms (GMOs)

Helpful Links:

- http://en.wikipedia.org/wiki/Neolithic_Revolution
- http://geography.unco.edu/department/faculty/DUNN/APHG/20%20Unit%20V,%20key%20terms,%20outline.doc
- http://www.encyclopedia.com/doc/1O110-agriculturalrevolution.html
- http://en.wikipedia.org/wiki/Green_revolution
- http://www.csa.com/discoveryguides/gmfood/overview.php