Developments of Agriculture

From the First Agricultural Revolution to Today
Agricultural Revolutions

• First Agricultural Revolution
  – 10,000 year ago – The initial domestication of plants and animals

• Second Agricultural Revolution
  – 250 years ago - Mechanization of agriculture with improved practices of cultivation, harvesting, and storage of farm produce.

• Third Agricultural Revolution
  – In progress – Centered around development of Genetically Modified Organisms
Second Agricultural Revolution

- Lasted from 1700s to early 1900s
- Coincided with the Industrial Revolution
  - New technologies developed to improve crop yields
  - Produced surplus to feed factory workers
- Supported by governments of Europe
  - Ex. Enclosure Act of Great Britain
Developments of Second Agricultural Revolution

- New fertilizer and artificial feed
- Selective breeding of livestock
- Planting of crops in rows
  - Easier to manage
  - Use of machines in planting
- Railroads decreased transportation time
Cyrus McCormick's Reaper

• Increased harvesting speed of wheat
  – Required less people for harvest
    • Led to urbanization and smaller family sizes
Third Agricultural Revolution

• Began in 1930s in United States
• Shift in roles of farmers
  – Primary Sector – Cultivation and harvesting of produce
  – Secondary Sector – Processing crops
  – Tertiary Sector – Marketing and advertising products
Developments in Third Agricultural Revolution

- Increase Mechanization
  - Increasingly replacing draft animals with machines
  - Spread of Mechanization outside of United States after World War II
  - Machines get larger, more powerful, and more efficient
Developments in Third Agricultural Revolution

• The Biotechnological Phase
  – Inorganic fertilizers and manufactured products replace manure and humus to increase soil fertility
  – Increasing use of herbicides, pesticides, and fungicides to increase yields
  – Began in United States in 1950s, spread to Europe in 1960s, and then the rest of the world in 1970s to 2000s
Developments in Third Agricultural Revolution

• Agri-Business
  – Development of business side of farming resulting in branding referred to as “value added”
  – Increasing connectedness of farming and business

• Blending of rural and urban
The Green Revolution

- The diffusion of agricultural technologies and practices to less developed areas
  - Specifically Mexico and Asia (India)
  - First practiced in 1940s in Mexico by Rockefeller Foundation
    - Sent agricultural experts to attempt to increase wheat yields
  - Primarily associated with 1960s
    - Norman Borlaug received 1970 Nobel peace prize for helping reverse famine of India and Pakistan

![Wheat yields in selected countries, 1950-2004](chart.png)

Source: FAO
Impacts of the Green Revolution

• Increased production
  – Rice production of Asia increases 66% between 1965 and 1985
  – India became self sufficient in some areas for wheat production
    • Paid back debts and became exporter of surplus

• Led to increased gaps between MDCs and LDCs
  – Areas that could not afford technology left behind
  – Lost competitiveness
Current Agricultural Practices

• Genetically Modified Crops – Crops that carry new traits that have been inserted through advanced genetic engineering methods
• Organic Agriculture - Approach to farming and ranching that avoids the use of herbicides, pesticides, growth hormones, and other similar synthetic inputs
Look for the label
These countries ban or require the labeling of foods that contain biotech ingredients.

KEY
- Ban or partial ban on biotech imports or commercial cultivation
- Biotech labeling required

*The European Union* has pledged to follow a consistent labeling standard for genetically modified products, but recently admitted countries may not have implemented it yet.

Current EU members:
- Austria
- Belgium
- Cyprus
- Czech Rep.
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Slovakia
- Slovenia
- Spain
- Sweden
- U.K.

Sources: Professor Colin Carter, UC Davis; Bee research

Sacramento Bee/Nathaniel Levine