

## ***Human Geography***

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## ***Human Geography***

Chapter 10. Agriculture

### **Chapter 10. Agriculture The Geography of Agriculture**

- A Brief History of Agriculture
- Classifying Agricultural Regions
- Intensity of Land Use and the Von Thünen Model
- Questioning our Agricultural 'Success'



### **Chapter 10. Agriculture The History of Agriculture**

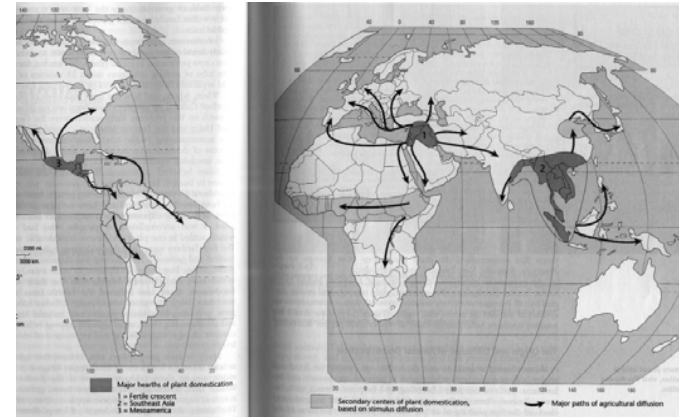
- Hunter-Gatherers
- Neolithic Revolution
  - Domestication of Plants and Animals
  - Diffusion of Agriculture
- Agricultural Industrialization
- The "Green Revolution"
- Modern Agribusiness

## Chapter 10. Agriculture Hunter-Gatherers

- Humanity's only "economic" activity for at least 90% of our existence.
- Low population densities.
- Wide variety of natural foodstuffs eaten.



## Chapter 10. Agriculture The Diffusion of Agriculture



Stimulus Diffusion - only idea is transferred.

## Chapter 10. Agriculture Modern Agricultural Revolutions

Technology allows much greater production (surplus) with less human labor, but has high social and environmental costs.

- Metal plows, Reapers, Cotton Gin
- Tractors (Internal Combustion Engine)
- Combines
- Chemical Pesticides/Fertilizers
- Hybrid crops
- The Green Revolution
- Genetically modified crops

## Chapter 10. Agriculture Agribusiness - The Industrialization of Agriculture

- Modern commercial farming is very dependent on inputs of chemical fertilizer, pesticides, herbicides.
- Oil is required to make fertilizer and pesticides.
- It takes 10 calories of energy to create 1 calorie of food in modern agriculture.
- Small farmer can't buy needed equipment and supplies.
- Fewer than 2% of U.S. population works in agriculture

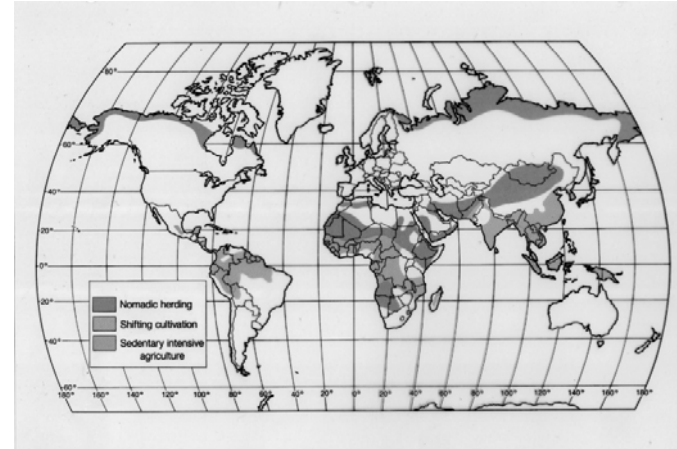
## Chapter 10. Agriculture Classifying Agricultural Regions

Subsistence Agriculture

- Shifting Cultivation
- Pastoral Nomadism
- Intensive Subsistence Agriculture



## Chapter 10. Agriculture Subsistence Agricultural Regions



## Chapter 10. Agriculture Shifting Cultivation

Vegetation "slashed" and then burned.  
Soil remains fertile for 2-3 years.  
Then people move on.

- where: tropical rainforests. Amazon, Central and West Africa, Southeast Asia
- Crops: upland rice (S.E. Asia), maize and manioc (S. America), millet and sorghum (Africa)

Declining at hands of ranching and logging.



## Chapter 10. Agriculture Pastoral Nomadism

The breeding and herding of domesticated animals for subsistence.

- where: *arid and semi-arid areas* of N. Africa, Middle East, Central Asia
- animals: Camel, Goats, Sheep, Cattle
- *transhumance*: seasonal migrations from highlands to lowlands

Most nomads are being pressured into sedentary life as land is used for agriculture or mining.



## Chapter 10. Agriculture Intensive Subsistence Agriculture

- *Wet Rice Dominant*
    - where: S.E. Asia, E. India, S.E. China
    - very labor intensive production of rice, including transfer to sawah, or paddies
    - most important source of food in Asia
      - grown on flat, or terraced land
- Double cropping is used in warm winter areas of S. China and Taiwan



## Chapter 10. Agriculture Classifying Agricultural Regions

### Commercial Agriculture

- Mixed Crop and Livestock Farming
- Dairy Farming
- Grain Farming
- Livestock Ranching
- Mediterranean Agriculture
- Truck Farming



## Chapter 10. Agriculture Commercial Agriculture

### *Mixed Crop and Livestock Farming*

Where: Ohio to Dakotas, centered on Iowa; much of Europe from France to Russia

- crops: corn (most common), soybeans
- In U.S. 80% of product fed to pigs and cattle
  
- Highly inefficient use of natural resources
  - Pounds of grain to make 1 lb. beef: 10
  - Gallons of water to make 1 lb wheat: 25
  - Gallons of water to make 1 lb. beef: 2500

## Chapter 10. Agriculture Commercial Agriculture

### Dairy Farming

Where: near urban areas in N.E. United States, Southeast Canada, N.W. Europe

*Locational Theory:* butter and cheese more common than milk with increasing distance from cities and in West.

- *milkshed:* historically defined by spoilage threat; refrigerated trucks changed this.



## Chapter 10. Agriculture Commercial Gardening and Fruit Farming

Where: U.S. Southeast, New England, near cities around the world

- crops: high profit vegetables and fruits demanded by wealthy urban populations: apples, asparagus, cherries, lettuce, tomatoes, etc.
- mechanization: such *truck farming* is highly mechanized and labor costs are further reduced by the use of cheap immigrant (and illegal) labor.
- distribution: **situated near urban markets.**



## Chapter 10. Agriculture Plantation Farming

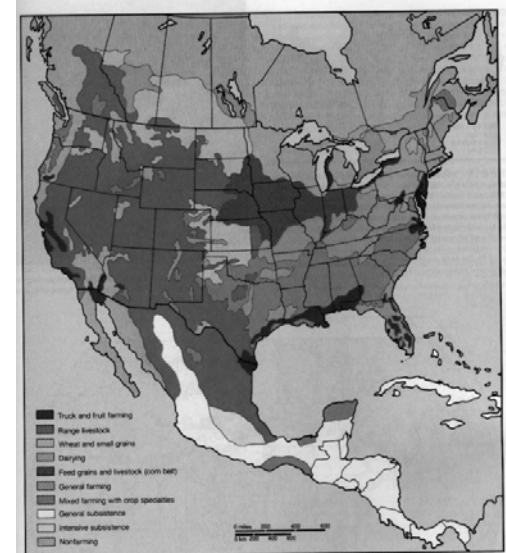
- large scale mono-cropping of profitable products not able to be grown in Europe or U.S.
- where: tropical lowland Periphery
- crops: cotton, sugar cane, coffee, rubber, cocoa, bananas, tea, coconuts, palm oil.

What are potential problems with this type of agriculture? Environmental?  
Economic?

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Making Sense of the  
Map of US  
Agricultural Regions



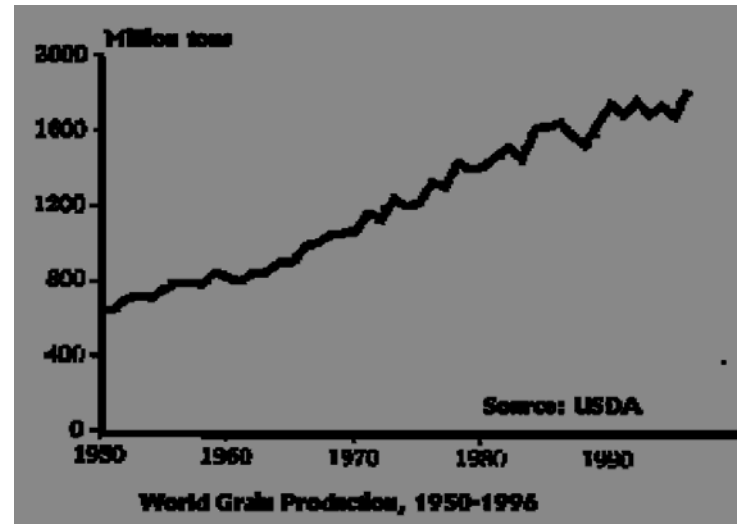
## Chapter 10. Agriculture

### The Green Revolution in Agriculture

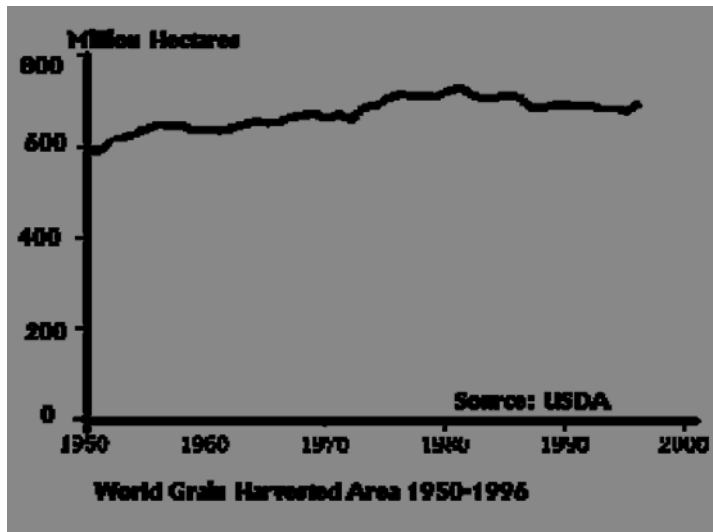
- The term *green revolution* refers to the development and adoption of high yielding cereal grains in the less developed world during the 1960s, 1970s, and 1980s. Very large short term gains in grain output have allowed food supplies to grow faster than populations, until very recently.

- Green Revolution History
- Acreage and Yield Trends
- Technical Problems
- Ethical Issues

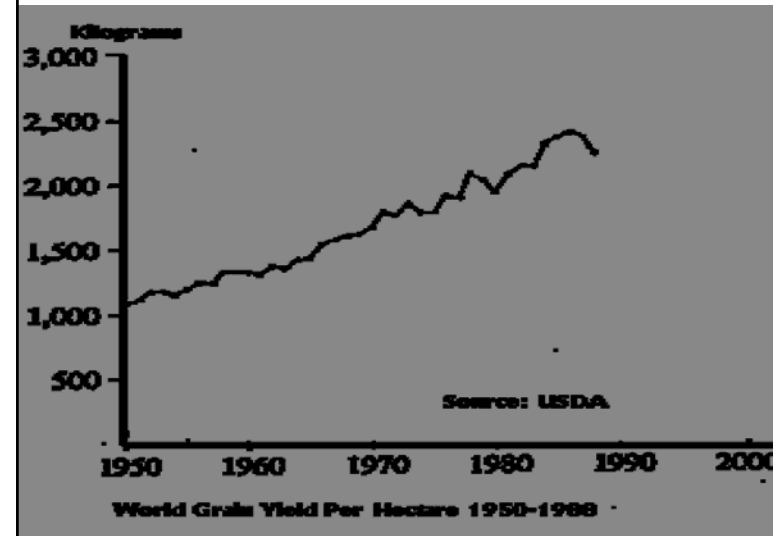
### Acreage and Yield Trends



### Acreage and Yield Trends



### Acreage and Yield Trends



## **Chapter 10. Agriculture** **History of the Green Revolution**

- 1943 Rockefeller Foundation begins work on short stature hybrid corn in Mexico
- 1960s Hybrid strains of rice, wheat, and corn show great success in S.E. Asia, and Latin America.
- 1970 Head of Mexican corn program, Borlaug, wins Nobel Peace Prize
- 1990s Growth in food supply continues, but slows to below the rate of population growth, as the results of unsustainable farming practices take effect.

## **Chapter 10. Agriculture** **Acreage and Yield Trends**

*Gains were made by:*

- Dwarf varieties: plants are bred to allocate more of their photosynthetic output to grain and less to vegetative parts.
- Planting in closer rows, allowed by herbicides, increases yields.
- Bred to be less sensitive to day length, thus double-cropping is more plausible.
- Very sensitive to inputs of fertilizer and water.

## **Chapter 10. Agriculture** **Technological and Resource Limitation Problems**

- Heavy Use of Fresh Water
- High Dependence on Technology and Machinery Provided/Sold by Core Countries
- Heavy Use of Pesticides and Fertilizer
- Reduced Genetic Diversity / Increased Blight Vulnerability
- Questionable Overall Sustainability

## **Chapter 10. Agriculture** **Ethical Issues**

- Starvation of many prevented, but malnourishment still common in LDCs.
- Life expectancy in less developed countries increased by 10 years in less than two decades (43 in 1950's to 53 in 1970's).
- There is more food per person now than at any other time in the history of agriculture.
- Wealthy farmers and multinational companies do well, small farmers become wage laborers or unemployed – dependent.
- More at risk? More people malnourished/starving today than in 1950 (but lower as a percentage).
- U.S. spends > \$10,000,000,000 year on farm subsidies, damaging farmers and markets in LDCs.

## **Chapter 10. Agriculture**

### **Agricultural Success**

*“Our incredible successes as a species are largely derived from this choice, but the biggest threats to our existence stem from the same decision.”*

Jared Diamond, 1999

- Emergence of new human diseases from animal diseases (i.e. smallpox, measles)
  - Dense urban populations allow spread/persistence of disease
- Lower standard of living for many people.
  - Archaeological evidence of serious mal-nourishment among early farmers.
  - Many modern impoverished and malnourished farmers.
  - Famine virtually non-existent in hunter-gatherer societies.
- Increased susceptibility to plant blights and increased dependence on complex economic systems.
- Environmental degradation
  - topsoil loss (75% in U.S.), desertification, eutrophication, PCBs in fish, DDT and other pesticides