Unit 5: Agriculture, Food Production and Rural Land

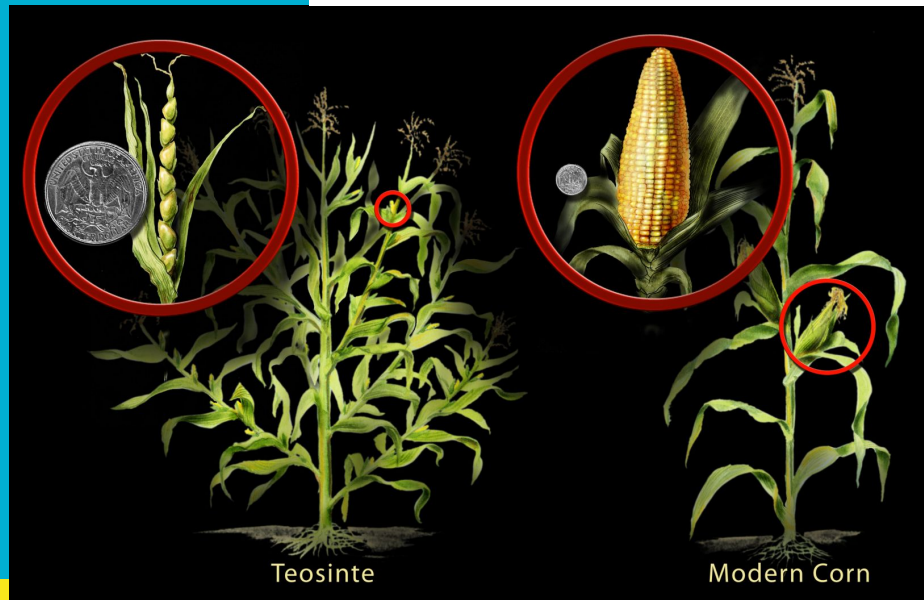
How It All Began

Origins of Agriculture

- Agriculture was first developed around 10,000 years ago
  - The process by which human alter the landscape in order to raise crops and livestock for consumption and trade
- Neolithic Revolution
  - First domestication of plants and animals
  - Also marked the beginning of permanent settlements and complex civilizations
- Second Agricultural Revolution (1700's)
  - Intensified agriculture using improved tools, fertilizers, and selective breeding
  - Provided food to newly industrialized cities and the growing population
- Third Agricultural Revolution (1960's)
  - Intensive mechanization and biotechnology
  - Large corporations started controlling agribusiness

Selective Cultivation of Corn

- Humans learned how and when plants ripened
- Began taking the seeds from the best yielding crops
    - Seed agriculture
- Improved yields through this selective breeding



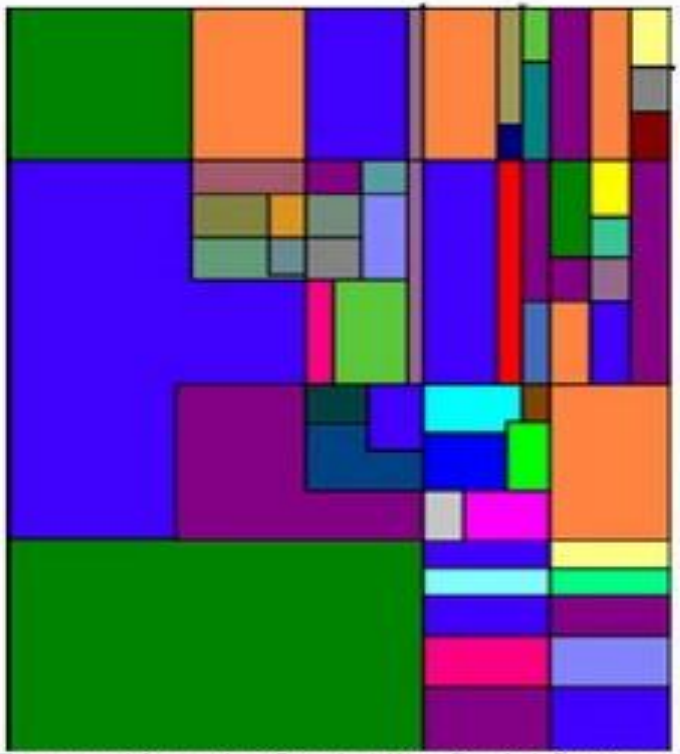
2nd Agricultural Revolution

- Needed increased food production
  - Large numbers of people moving into urban centers to get work in factories
  - Less people in rural areas to grow crops.
- Technology
  - Probably the biggest game changer in agriculture (list on next page)
  - Industrial Revolution introduced new technology and metals making tools stronger and more efficient
- British Enclosure Acts
  - Allowed individuals to buy public land and enclose it for private use
  - Farms became larger and with no public land several small farmers were pushed out of the profession.

EARLY ADVANCES IN MODERN AGRICULTURE		
Advancement	**Date**	**Effect**
Iron/Steel Plough	1819	• Reduced human labor • Could break through harder soils • Increased amount of crops grown per acre • Increased size of farms
Mechanized Seed Drilling	18th century	• Planted and covered each seed quickly • Resulted in increased yield per acre
McCormick Reaper/ Harvester	1831	• Increased harvest • Reduced human labor • Reduced amount of crops that perished in the field before harvest
Grain Elevator	1849	• Increased storage space and food supply • Protected harvested food from animals and the elements
Barbed Wire	1870s	• Provided inexpensive fencing to keep livestock in grazing areas
Mixed Nitrogen and Nitric Acid Fertilizer	1903	• Increased crop yields per acre

Enclosure Acts

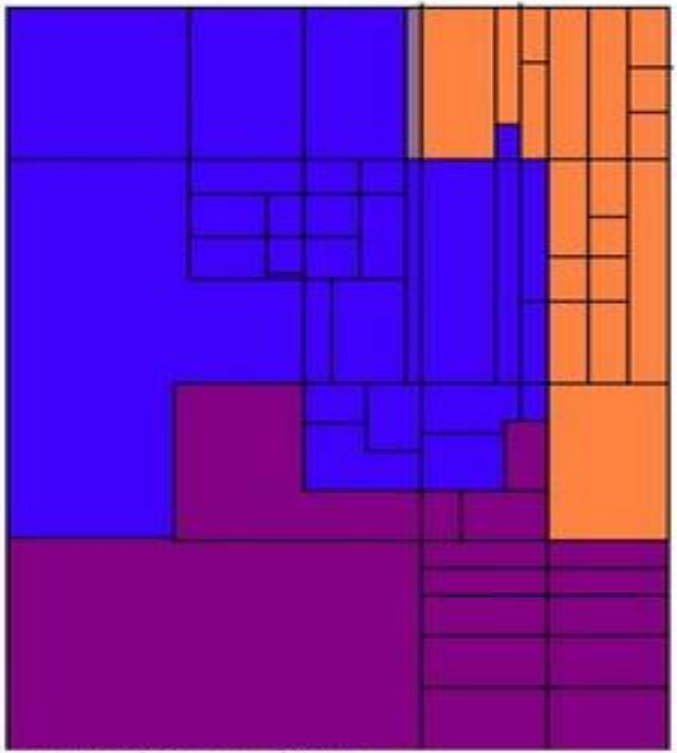
A Typical English Community Before Enclosure



Legend

- = Baron's Land
- = Rich Farmer's Land
- = Other Rich Farmer's Land
- = Common Land
- Other Colors = Small Farmers

A Typical English Community After Enclosure



Extracted from the Grade Nine Social Studies curriculum, http://www.cssd.ab.ca/tech/social/tut9/lesson_2.htm

Third Agricultural Revolution

- Blended primary activities with secondary and tertiary activities
  - Primary: straight forward ranching, farming, etc. (growing the corn)
  - Secondary: take the primary product and change it into something else (turning corn into corn syrup or fuel)
  - Tertiary: service sector, connects producers to consumers (marketing the product to consumers)
- Moved food production more into the corporate world
  - The Illusion of Choice
  - Most food now produced and sold by around 11 corporations


KRAFT
Coca-Cola
PEPSICO
Kellogg's
MARS
WRIGLEY
Nestlé
P&G
Johnson&Johnson
Unilever
GLACÉAU
Yum!
QUAKER
Cadbury
DR PEPPER SNAPPLE
Spin-off
$$$

The Green Revolution

- Movement which created new high yield, hybrid seeds and new technologies
  - Focused on three crops: wheat, corn, and rice
  - Key architect was Norman Borlaug, microbiologist
- Hybrid crops
  - Breeding two crops that have desirable characteristics
  - Due to globalization they had a wider variety of crops to choose from
- GMO's
  - Genetically modified organism
  - Humans change the DNA of a seed to add certain qualities
  - Higher yield, drought resistant, pest resistant, etc.

Positives of the Green Revolution

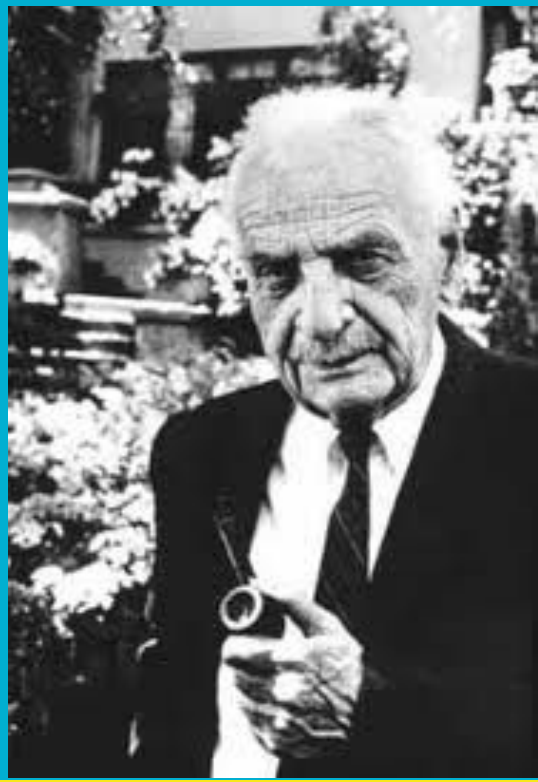
- Increase in Global Food Production
  - Has kept up with world population growth, helping stave off famine
  - Most successful in Latin America, South Asia, East Asia and Southeast Asia
- Food Prices
  - Because of increased production food prices have decreased
  - Reduced the economic stress of hunger and famine.

Negatives of the Green Revolution

- Environmental Damage
  - Environment suffered due to fertilizers, pesticides, and fossil-fueled equipment.
  - Soil erosion from irrigation and intensive farming
  - Poisoning and depletion of natural water sources
  - Increased machinery use led to air pollution and global warming
- Economic Changes
  - Cost of production increased pushing several small farmers out of business
  - Due to the cost of farming unskilled workers had to move to urban areas looking for work
  - Cheap labor became available in SE Asia and corporations moved manufacturing to these areas.
- Little success in Africa
  - Wide variety of soils and climates makes finding the right seeds and fertilizer difficult
  - Lack of transportation infrastructure
  - Their common crops were not being heavily researched for GMO or hybridization

Origins of Agriculture (cont.)

- Carl Sauer
  - Wrote *Agricultural Origins and Dispersals (1969)*
  - Argued that agricultural hearths developed independently
  - First occurance on tropical shores and on the edge of forest
- Spread of Agriculture
  - Agriculture brought about civilization
  - Civilization brought about trade



MAJOR HEARTHS OF CROP AGRICULTURE			
Time Period	**Location**	**Crops**	**Early Diffusion Pattern**
10,000 to 12,000 Years Ago	Southwest Asia (Fertile Crescent)	• Barley • Wheat • Lentils • Olives • Oats • Rye	• North Africa • Southern Europe • Central Asia
10,000 Years Ago	Southeast Asia	• Mango • Taro • Coconut	• Southeastern Asia
9,500 Years Ago	East Asia	• Rice • Soybean • Walnut	• North Central Asia • Korean peninsula
7,000 Years Ago	Sub-Saharan Africa	• Yams • Sorghum • Cowpeas • Coffee • African rice	• Western Africa • North Africa
5,500 Years Ago	Mesoamerica	• Squash • Peppers • Maize (corn) • Potato • Sweet potato • Cassava	• North America • South America

Humans Altering the Environment

- Terraced Farming
  - Steps built into hills
- Slash-and-Burn
  - Vegetations is cut down and burned
  - Earliest agricultural practice
  - Farmed for a few years then abandoned
- Irrigation
  - Diverting water to assist in the production of crops
  - Can damage the local environment
  - Used extensively in California

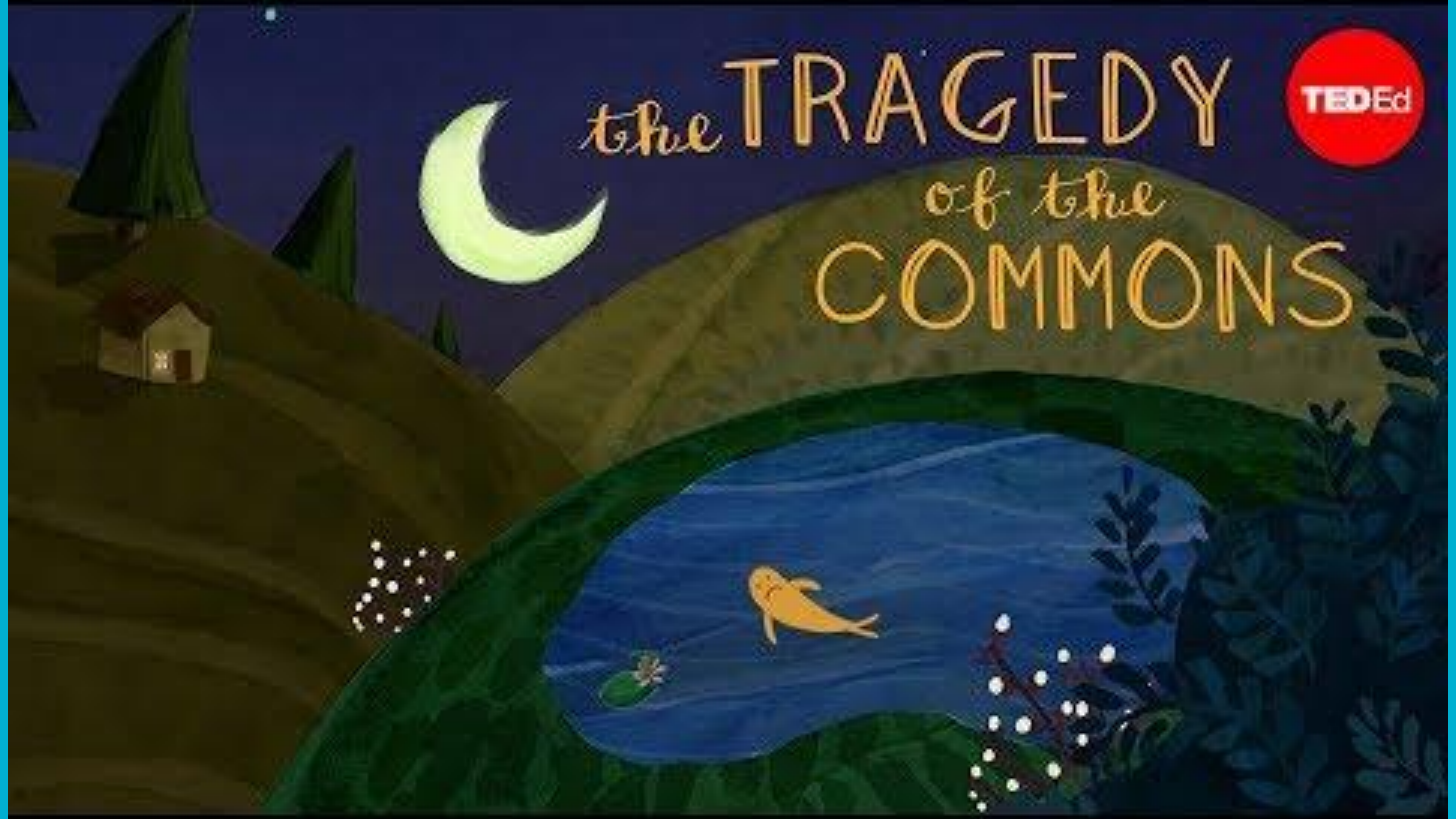
Subsistence vs. Commercial Agriculture

- Subsistence Farming
  - Mainly found in less developed countries (LDC's)
  - Focused on raising food needed to survive
  - Remaining product is used to exchange for other goods
- Commercial Farming
  - Cash crops
  - Tend to focus on growing one crop
  - Sell for profit
  - Has replaced subsistence farming

Rural Land Use Patterns

Land Use Models

- There are four types of models:
  - Economic: shopping mall
  - Sustainability: crop rotation
  - Environmental: nature trail with picnic area
  - Preservationist: retaining land without human impact
- Tragedy of the Commons
  - Pertains to the use of resources, land use, and the environment
  - Dilemma between doing what is best for you the individual vs. what's best for the group.
  - "It stands to reason that people behave selfishly, but if too many people behave selfishly, the group will suffer….and then everyone in the group individually will suffer"
  - Do you think this would apply to the protest throughout the US to reopen the country?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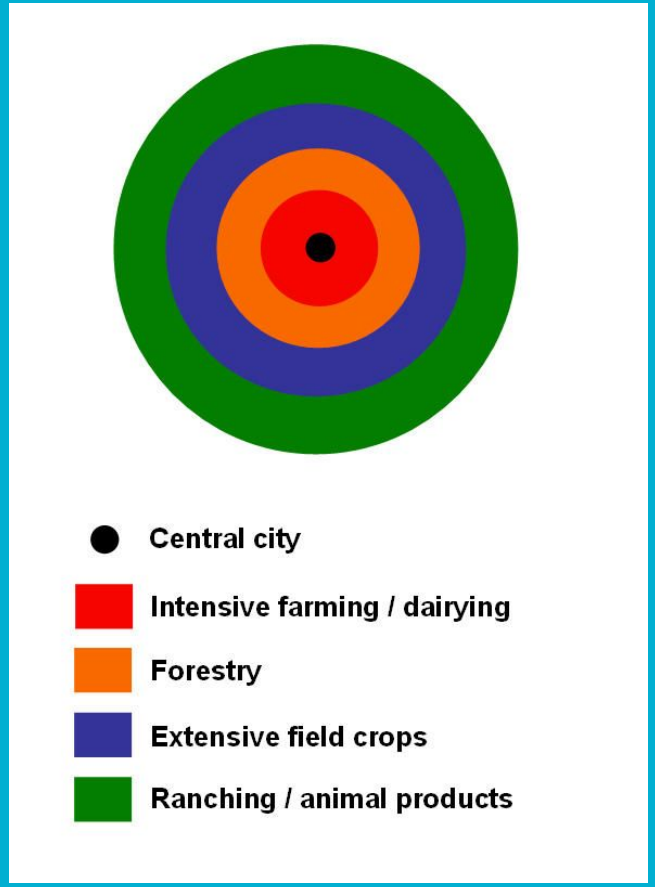
Von Thunen Model

- Model created to explain what products farmers would grow in relation to the market where they sell their products.
- Takes into account:
  - Land Cost and amount of land needed
  - Transportation Cost and time



Von Thunen Model Assumptions

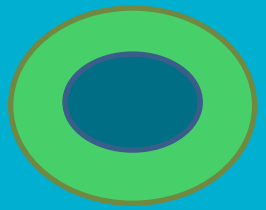
- **Models are made in a vacuum thus for it to work we must have certain assumptions:**
  1. The city is located centrally within an "Isolated State" which is self sufficient and has no external influences.
  2. The Isolated State is surrounded by an unoccupied wilderness.
  3. The land of the State is completely flat and has no rivers or mountains to interrupt the terrain.
  4. Farmers in the Isolated State transport their own goods to market via oxcart, across land, directly to the central city. Therefore, there are no roads.
  5. The soil quality and climate are consistent throughout the State.
  6. Farmers act to maximize profits.

City/Town/Village:

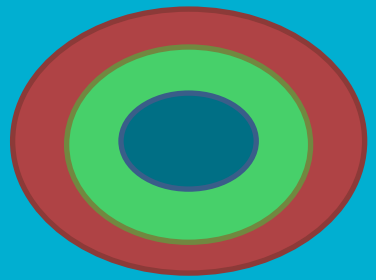
At the heart of the model is the city, where the people live and work.

Horticulture and Dairying:

Dairy farming is done close enough to transport milk to market without spoiling.

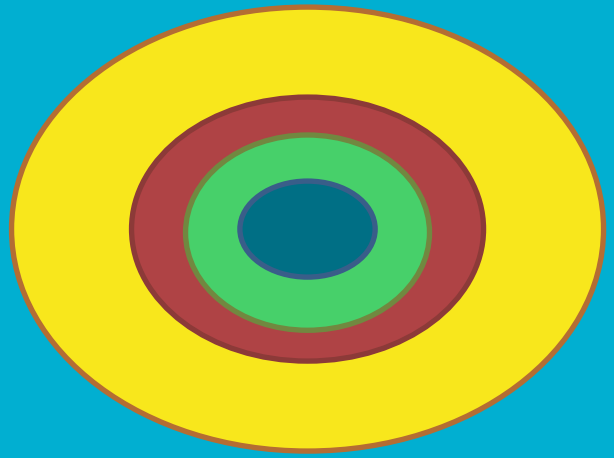


***Dairying and intensive farming* occur in the ring closest to the city. Since vegetables, fruit, milk and other dairy products must get to market quickly, they would be produced close to the city (remember, we don't have refrigerated oxcarts!)**



- Forest resources (Timber and firewood) would be produced for fuel and building materials in the second zone.

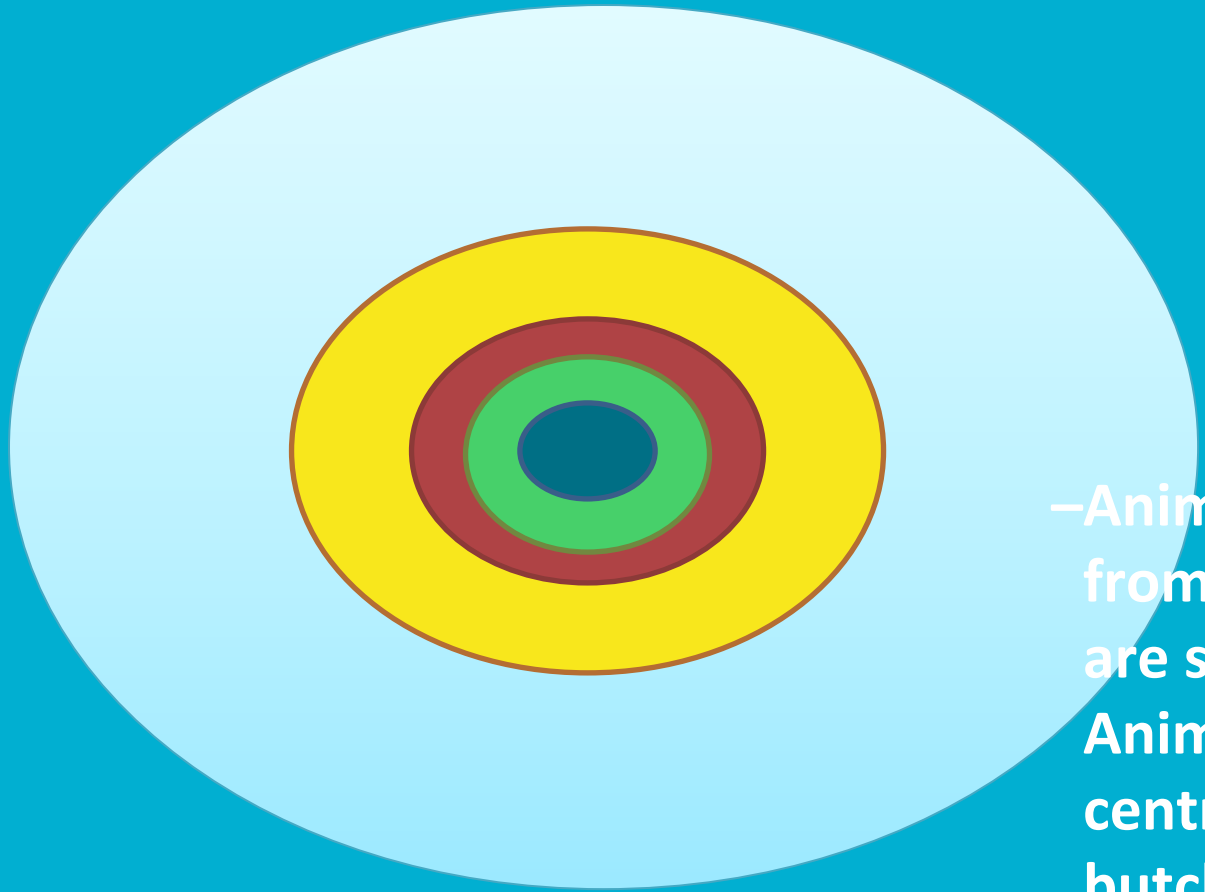
Before industrialization (and coal power), wood (forest) was a very important fuel for heating and cooking. Wood is very heavy and difficult to transport so it is located as close to the city as possible.



Crop Rotation/Pastures

Grain production

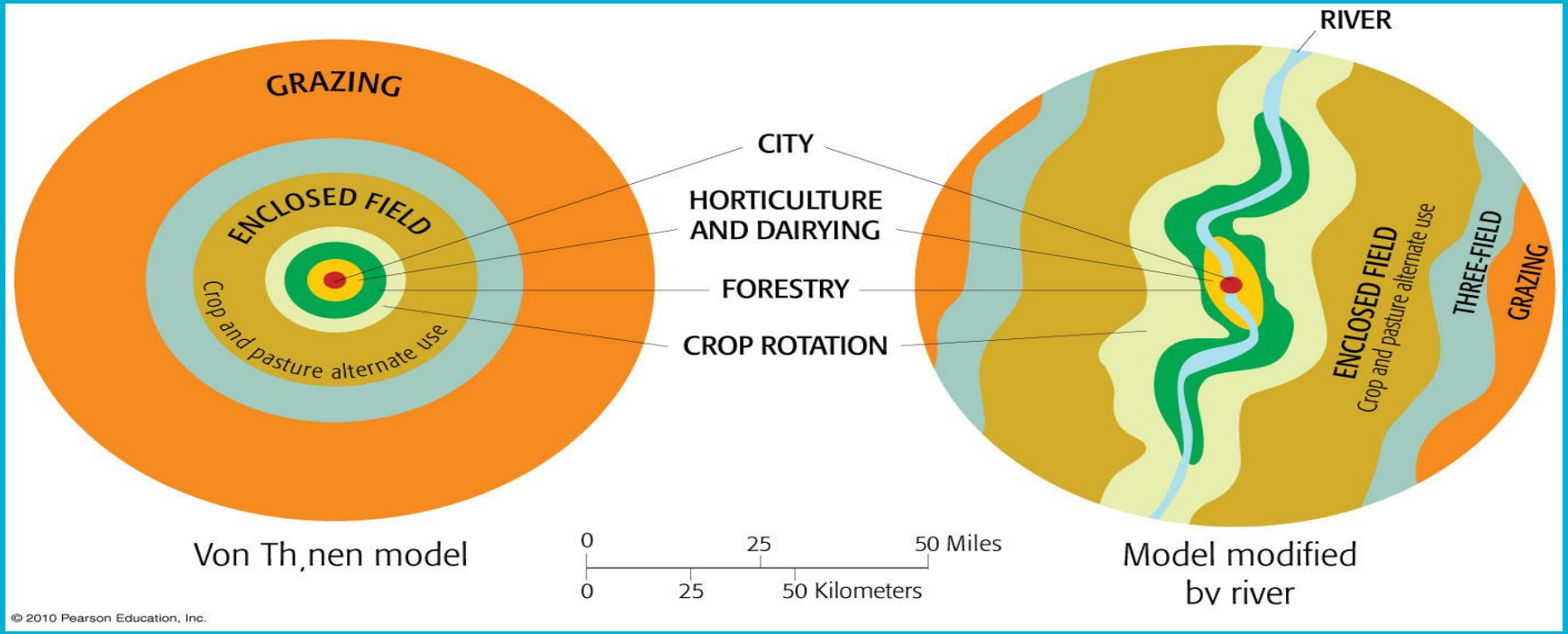
Since grains last longer than dairy products and are much lighter than fuel, reducing transport costs, they can be located further from the city.



Extensive Ranching and Grazing

– Animals can be raised far from the city because they are self-transporting. Animals can walk to the central city for sale or for butchering.

- **As one gets closer to a city, the price of land increases**.
- The farmers of the Isolated State **balance the costs of transportation, land, and profit and produce the most cost-effective product for market.**


GRAZING
ENCLOSED FIELD
Crop and pasture alternate use
CITY
HORTICULTURE AND DAIRYING
FORESTRY
CROP ROTATION
RIVER
ENCLOSED FIELD
Crop and pasture alternate use
THREE-FIELD
GRAZING
0
25
50 Miles
0
25
50 Kilometers
Von Th¸nen model
Model modified by river
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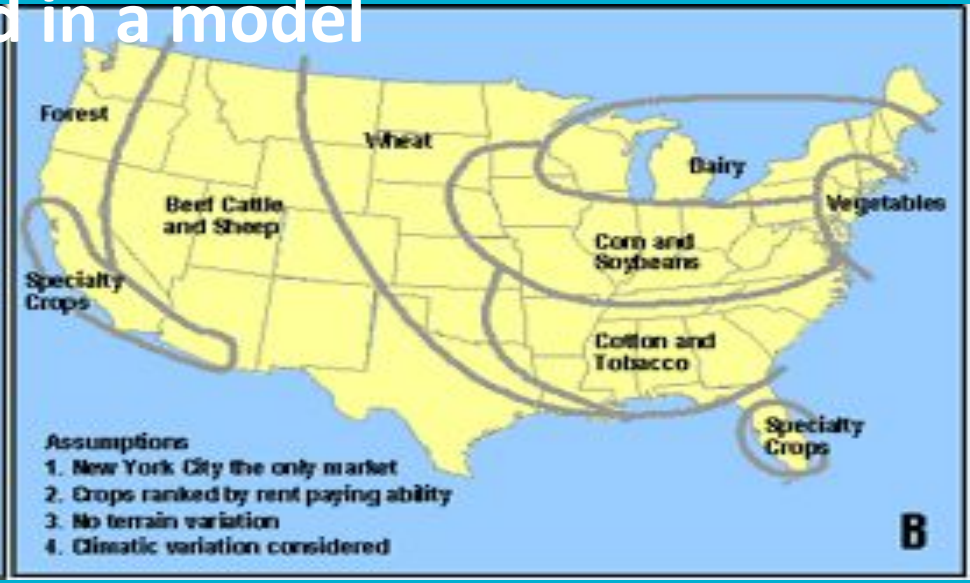
Remember folks, in the real world, things don't happen as they would in a model



...applying von Thunen's basic assumptions

...von Thunen's model with Variations in climate factored in--the north is colder than the South.

Agricultural Regions

AGRICULTURAL REGIONS		
Agricultural Practice	**Climate**	**Locations**
Pastoral Nomadism	Drylands	• Southwest, Central, and East Asia • North Africa
Shifting Cultivation	Tropical	• Latin America • Sub-Saharan Africa • Southeast Asia
Plantation	Tropical/Sub-Tropical	• Latin America • Sub-Saharan Africa • South and Southeast Asia
Mixed Crop/ Livestock	Cold and Warm Mid-Latitude	• Midwestern United States and Canada • Central Europe
Grain	Cold Mid-Latitude	• North Central United States • South Central Canada • Eastern Europe
Commercial Gardening	Warm Mid-Latitude	• Southeastern United States • Southeastern Australia
Dairy	Cold and Warm Mid-Latitude	• Northeastern United States • Southeastern Canada • Northwestern Europe
Mediterranean	Warm Mid-Latitude	• Southern coast of Europe • Northern coast of Africa • Pacific coast of the United States • Southern tip of Africa • Chile
Livestock Ranching	Drylands	• Western North America • Southeastern South America • Central Asia • Southern Africa
Intensive Subsistence	Warm Mid-Latitude	• South, Southeast, and East Asia • Near large populations
None	Polar	• Arctic • Antarctica

Economic Forces

- Economic forces play a huge role in what/where.when farmers plant.
- Extensive land use
  - Uses few inputs of capital
  - Shifting cultivation, nomadic herding
- Intensive land use
  - Greater inputs of capital
  - Rice paddies, market gardening, plantations

PURPOSES OF AGRICULTURE		
Land Use Methods	**Commercial**	**Subsistence**
Intensive	• *Location:* usually near urban centers or transportation hubs • *Examples:* truck farming and dairy farming • *Inputs:* large amounts of labor and machinery, often on large amounts of land	• *Location:* usually near densely populated areas with access to local markets • *Examples:* farmers who grow wide variety of crops such as corn, cassava, millet, or yams and raise some livestock • *Inputs:* often labor-intensive production on small plots
Extensive	• *Location:* usually near transportation centers with access to processing centers • *Examples:* livestock ranching; some grain farming • *Inputs:* minimal amount of labor and machinery on a large expanse of land	• *Location:* usually in sparsely populated areas with access to local markets • *Examples:* pastoral nomadism and shifting cultivation • *Inputs:* minimal amount of machinery, but sometimes labor-intensive work on a large plot of land that might be owned communally

Commercial Agriculture

- Agribusiness
  - Integration of various steps of production in the food processing industry
  - processing , production, transportation, marketing, retail, research and development
  - Done by large national corporations
- Due to the rise of agribusiness large scale farms have replaces small farms
  - Usually practices monoculture: growing one cash crop on a large chunk of land.
  - Due to lack of available land subsistence farmers now have to work for agribusiness
  - Suitcase farm: no one who works on the farm lives on the farm

Regional Interdependence

- With the growth of agribusiness and monoculture farming countries and regions have become more interconnected.
- Growth of luxury crops
  - Ones not essential for human survival
  - Usually grown in tropical locations
- Provides wealthy consumers and countries with vast choices, can cause problems in developing countries
  - Farmers may not be able to afford to eat the food they grow
  - Supply of locally grown food drives up the cost of food for local peoples
  - Production may not be sustainable because of growth or environmental depletion

Regional Interdependence

- Fair Trade
  - An effort to promote higher incomes for producers and more sustainable farming techniques, especially in developing countries.
  - Agreements have been reached over several crops
  - Raise the cost a little for consumers, but provide a bigger revenue share to the producers
- Government Subsidies
  - Public support of farmers to drive down the cost of food for consumers
  - Widely used in the US
  - Has three goals:
    - Provide a dependable food supply
    - Help farmers by increasing agricultural exports
    - Help consumers by reducing food cost