Know and be able to: Chp. 10 Name ___________________________________________ AGRICULTURE

KNOW
agribusiness
agriculture
agricultural revolution (#1-#2-#3)
Boserup Theory of Agriculture
cereal grain
commercial agriculture
crop
crop rotation
desertification
domestication of animals
double-cropping
grain
Green Revolution
factory farming/industrial farming

horticulture
Growth Hormone or rBGH
GMO (genetically modified)
Intensive subsistence agriculture
Milkshed
Organic farming (handout)
paddy
pastoral nomadism
planation farming
prime agricultural land
ranching
ridge tillage
sawah
seed planting (handout)

shifting cultivation
slash-and-burn (swidden)
spring wheat/winter wheat
subsistence agriculture
subsidy (handout)
sustainable agriculture
swidden
transhumance
truck farming
value-added agriculture
vegetative planting (handout)
von Thünen Model of Agriculture
wet rice

BE ABLE TO
☑ explain how agriculture originated and identify its various hearths.
☑ describe the evolution of agricultural practices from their first use until today.
☑ correlate climate and terrain with various agricultural regions.
☑ describe and apply the von Thünen model to both small and large scale situations.
☑ map linkages between regions of production and consumption at different scales.
   ☑ world regions of export and import
   ☑ production and consumption (market) regions within a single state
☑ use agricultural practice to differentiate between less developed and relatively developed countries.
☑ discuss current trends and recent changes in agricultural practices in both developed and developing regions
   ☑ farm size and farming methods
   ☑ crop types
   ☑ effects of changing markets and government practices
☑ describe rural settlement in terms of:
    ☑ survey systems; long lot (seigneurial), rectangular, metes and bounds
    ☑ settlement types; linear, dispersed, clustered
    ☑ causes, effects, and regions associated with different settlement patterns

READING ASSIGNMENTS
• ORIGINS OF AGRICULTURE

1. Define agriculture:

2. Define crop:

3. What are the characteristics of a hunter-gatherer society? List 10 characteristics
   a. 
   b. 
   c. 
   d. 
   e. 
   f. 
   g. 
   h. 
   i. 
   j. 

b. How many hunter-gatherers are there today?

c. Where do they live?

Invention of Agriculture p. 309

Two Types of Planting:

Vegetative planting: Earliest form of plant cultivation in human civilization. Refers to the method of dividing or cutting stems in order to propagate clones of previously existing plants. This is asexual form of reproduction. Examples = stems, bulbs, shoots, tubers, onions, yams, taro root.

Seed planting: method of planting seeds which is reproduced by sexual reproduction: production flowers or fruits: male/female. Examples: wheat, barley, beans, sorghum, cotton, corn, squash, mango, coconut, rice, soybeans, oats, rye, olives, chestnuts, walnuts, peas, potatoes, sweet potatoes, peppers

4. Southwest Asia (Tigris-Euphrates River valley) was an early center of crop domestication. The 2 earliest crops thought to have existed were: __________________________ and __________________________

5. Also ____________ and ____________ were early domestications in SW Asia.

6. From Southwest Asia, cultivation diffused _______ to _______ and east to ____________.

7. _______ is thought to have been domesticated in East Asia more than 10,000 years ago.

8. ____________ was domesticated in central Africa around 8,000 years ago along with__________.

9. Millet and rice may have been domesticated in ____________________ independently of the hearth in East Asia.
10. From Central Africa, domestication of crops probably ________________.

11. What two Latin American countries were hearths of crop domestication around 4,000 to 5,000 years ago? ________________ and ________________.

12. Hearth for cotton and beans is ________________. Potato hearth is ________________.

13. The most important contribution of the Americas to crop domestication was ____________.

14. Label the hearth areas for the above crops and the hearths of dogs, pigs, goats, sheep, and horse.

15. Turn to pg. 310 and the last paragraph on the right hand side above “Subsistence and Commercial Agriculture.” The diversity in origins of agriculture from earliest times has produced food in distinct ways in different regions. This diversity is derived from:
   a. ________________
   b. ________________
   c. ________________

- CLASSIFYING AGRICULTURAL REGIONS – Subsistence and Commercial Agriculture p. 310-311

16. Define subsistence agriculture:

17. Define commercial agriculture:

18. Who prepared the most widely used map of world agricultural regions? When?
Look at Figure 10-4 p. 312
List the 4 Subsistence Agriculture types in Less Developed Countries:

a.  
b.  
c.  
d.  

List the 5 types of Commercial Agriculture important to MDCs: a.  
b.  
c.  
d.  
e.  

19. Read this section of the chapter and complete the table below with pertinent information. The text will generally explain commercial agriculture and you will need to deduce the situation of subsistence agriculture on your own.

<table>
<thead>
<tr>
<th>Subsistence Agriculture (mostly in LDCs)</th>
<th>Commercial Agriculture (mostly in MDCs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose of Farming</td>
<td></td>
</tr>
<tr>
<td>% of farmers in labor force</td>
<td></td>
</tr>
<tr>
<td>Use of machinery</td>
<td></td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
<tr>
<td>Scientific advances</td>
<td></td>
</tr>
</tbody>
</table>

   No subsistence

   No subsistence.
<table>
<thead>
<tr>
<th>Electronics</th>
<th>No subsistence.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farm Size</td>
<td>No info for Subsistence. Define: prime agricultural land:</td>
</tr>
<tr>
<td></td>
<td>Notes about Farm Size</td>
</tr>
<tr>
<td>Relationship of Farming to Businesses</td>
<td>No info for Subsistence. Definition of agribusiness:</td>
</tr>
<tr>
<td></td>
<td>Notes about agribusiness</td>
</tr>
</tbody>
</table>

**Facts to Know for AP from Mrs. Tweed**

- Approximately \( \frac{1}{3} \) of the people in LDCs are farmers
- Much of the land surface of our planet is devoted to agriculture
- Only 2% of USA's population are farmers
- Agriculture is a major contributor to environmental change in the forms of: pesticide, fertilizer run-off, soil erosion, freshwater depletion, damming of rivers for irrigational purposes, and deforestation.

10. 5 principal features distinguish commercial agriculture from subsistence agriculture: p. 311

a.

b.

c.

d.

e.

Push and Pull Migration Factors are REASONS for decline in Farming.

1. People are **pushed** away from farms by lack of opportunity to earn a decent income.
2. People are **pulled** to higher-paying jobs in urban areas.
Where Are Agricultural Regions in Less Developed Countries?

This issue looks at four agricultural types characteristic of LDCs

* * *

● SHIFTING CULTIVATION
1. In what climate does shifting cultivation predominate? What are its two characteristics?

2. Identify the two distinctive features of shifting cultivation.
   (a) slash-and-burn agriculture which means:

   (b)

3. Describe the people who practice shifting cultivation:

4. List the 5-step process of shifting cultivation
   (a)
   (b)
   (c)
   (d)
   (e)

5. Regarding a swidden...
   a. what is it?

   b. What is potash?

   c. How long are swiddens used?

6. List crops typical of shifting cultivation. p. 315

Ownership and use of Land in Shifting Cultivation p. 3167
7. How is land owned in a typical village that practices shifting cultivation?

8a. What percentage of the world's land area is devoted to shifting cultivation?

8b. What percentage of the world's people work it?

9. Identify THREE economic activities that are replacing shifting cultivation. FUTURE of... p. 317
10. Describe the pros and cons of shifting cultivation, or the arguments made for it and criticisms leveled against it, in the spaces below.

<table>
<thead>
<tr>
<th>PROS (Arguments against replacing shifting cultivation.)</th>
<th>CONS (How is shifting cultivation being replaced?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
</tr>
</tbody>
</table>

- **PASTORAL NOMADISM** p. 318

11. What is *pastoral nomadism*?

12. In what type of climate is it usually found?

13. What regions of the earth are currently occupied by this practice?

14. How do pastoral nomads obtain grain?
   a. 
   b. 
   c. 

15. What animals are chosen, and where?

16. Describe the movements of pastoral nomads.
   a. 
   b. 
   c. 
   d. 

17. What is *transhumance*?

18. What is *pasture*?

19. In what FOUR ways is pastoral nomadism currently threatened by modern governments?
   a. 
   b. 
   c. 
   d. 

- **INTENSIVE SUBSISTENCE FARMING** p. 319

20. What is meant by “intensive”?

21. Where is intensive subsistence agriculture practiced? Why there?
Intensive Subsistence with Wet Rice Dominant p. 319

22a. What is “wet rice”?

22b. What is a “paddy”?

23. Wet rice requires a flat field – but some farmers must cultivate it in hilly or mountainous regions. How do they accomplish this?

24. What is double-cropping?

25. Where is double-cropping possible? Not possible?

Intensive Subsistence with Wet Rice Not Dominant p. 321

26. In areas of intensive subsistence agriculture where wet rice is not dominant, what is the major crop?

27. Explain crop rotation:

28. PLANTATION FARMING p. 321 Define/describe plantation farming by filling in the table.

<table>
<thead>
<tr>
<th>Climate</th>
<th>PLANTATION FARMING</th>
<th>Continents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situated in</td>
<td>Owned and operated by</td>
<td>Workers</td>
</tr>
<tr>
<td></td>
<td>a.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c.</td>
<td></td>
</tr>
<tr>
<td>Types of Crops</td>
<td>Definition of Plantations</td>
<td></td>
</tr>
</tbody>
</table>
Where Are Agricultural Regions in More Developed Countries?

MDCC practice Commercial Agriculture: 6 main types
a. 

b. 

c. 

d. 

e. 

f. 

- MIXED CROP AND LIVESTOCK FARMING: integration of crops and livestock: distinctive characteristic

1. Where is mixed crop and livestock farming common?

2. Describe the irony between the amount of land devoted to crops vs. animals and the income generated by each in this region.

3. How does this type of agriculture allow farmers to more evenly "distribute their workload"?

4. Define/describe the following as they relate to crop rotation: p. 322-323
   a. cereal grains:

   b. fallow: use your dictionary

   c. rest crop:

5. Where is the US Corn Belt and what crop is making rapid inroads among farms there? p.322

6. In what different ways is the corn used? (under Characteristics of Mixed Crop and Livestock)

- DAIRY FARMING  p. 323-324

7. What country is the world’s largest producer of dairy products? (Who follows?)

8. What is a milkshed?

9. Why do some regions specialize in "milk products" like cheese and butter rather than fluid milk? Identify some these important regions.
10. What problems do dairy farmers currently face?
   a.  
   b.  
   - GRAIN FARMING p. 325

11. What is the principal difference between grains grown in “commercial grain farming” regions and grains grown in “mixed crop and livestock” regions?

12. Complete a bullet list which details the importance of wheat as a crop.

13. Identify the three regions of large-scale grain production in North America.

14. How do farmers and combine companies make use of the fact that the wheat matures at different times in the spring and winter wheat belts?

- LIVESTOCK RANCHING p. 326
Ranching definition:

15. What type of climate is livestock best adapted to?

16. Describe the “stages” of ranching as it has evolved in the US (and very similarly elsewhere) in the flowchart below.

17. Make brief notes to describe the following: next page
1.  
2.  
3.  
4.  

**History of Ranching in South America**  
1.  
2.  
3.  
4.  

**MEDITERRANEAN AGRICULTURE** p. 328  
18. Describe the climatic conditions of Mediterranean climate and agriculture.

19. Most crops in Mediterranean lands are grown for __________________________ rather than for __________________________.

20. What is *horticulture*?

21. List the TWO most important cash crops of Mediterranean regions.

22. Describe the role (and changing role) of *California* in Mediterranean agriculture.  
   a.  
   b.  
   c.  
   d.  

**COMMERCIAL GARDENING AND FRUIT FARMING** p. 329  
23. What three conditions make the US southeast an ideal location for this type of agriculture?

24. What are the two groups to whom “truck farmers” sell their crops?

25. List the three ways that truck farmers keep labor costs low.  
   i.  
   ii.  
   iii.  

26. What is “specialty farming” and where has it spread in the US?
Intro points: Commercial (MDCs) and Subsistence farmers (LDCs) faced comparable challenges
- Both have difficulty generating enough income to continue farming
- Commercial farmers can produce a surplus of good
- Subsistence farmers are barely able to produce enough food to survive

**CHALLENGES FOR COMMERCIAL FARMERS p. 329**
What does it mean, “Commercial farmers are in some ways victims of their own success:

a.

b.

Importance of Access of Markets: the distance from the farm to the market influences the farmer’s choice of crop to plant.

**Von Thunen’s Model of Agriculture – 1826 – German estate owner The Isolated State**
1. According to the model, a commercial farmer

2. The farmer compares two costs:

3. Von Thunen found that specific crops were

4. 1st ring out from the city:
   These products are

5. 2nd ring out from the city:
   The closeness of this commodity is because of its

6. 3rd ring:
   The specific commodity was

7. 4th ring or outermost ring:
   This requires

Failures of Von Thunen’s Model

a.

b.

Von Thunen’s Model is applicable on a national or global scale because
von Thunen’s Model – Chapter 10 Agriculture – NOTES for Understanding
Johann Heinrich von Thunen – Germany – 1826

Assertions: Basic Premises

1. A commercial farmer initially considers which crops to cultivate and which animals to raise based on the market location
2. In choosing which crops plant and which animals to raise, the farmer compares two costs: cost of the land versus the cost of transporting products to market.
3. Based his model of the spatial arrangement of different crops on his experiences as owner of large estate in N Germany during early 1800s
4. He assumed that all land in a study area had similar site characteristics and was of uniform quality.
5. He recognized the model could vary according to topography and other distinctive physical conditions. Example: a river might modify the shape of the rings because the transportation costs change when products are shipped by water routes rather than over roads.

von Thunen’s Rings: Specific crops are grown in different rings around the cities in the area

1st ring: market-oriented gardens and milk producers located outside of city. Benefits: These products are expensive to deliver and must reach the market quickly because they are perishable.

2nd ring: out from the cities: contains wood lots where timber is cut for construction and fuel. Benefits: closeness to market is important because of the weight of timber.

3rd ring: used for various crops and for pasture. Benefits: the specific crop was rotated from one year to the next.

Outermost ring: devoted exclusively to animal grazing which requires lots of space.

Failures of the Model of von Thunen’s

1. Not all cities with surrounding lands have similar site characteristics or a uniform quality
2. Failed to consider that social customs and government policies influence the attractiveness of plants and animals for a commercial farmer.

How von Thunen’s Model is Applicable on a National and Global Scale

1. Farmers in remote locations who wish to sell their output in the major markets of Western Europe and North America are less likely to grow highly perishable and bulky products, for example.

Notes from Cracking the AP Human Geography Test: Barron’s and Princeton Review

1. He noticed that lands that appeared to have exactly the same physical geography were actually being used for very different agricultural purposes
2. He explained this idea through the concept of RENT (land value)
3. RENT or land value will decrease the farther one gets away from the central markets.
4. Rent is highest in close proximity to urban markets.
5. Only the agricultural products that use the land intensively, have high transportation costs, and were in great demand would be located close to urban markets.
6. Products that were in lower demand required more extensive land use, or were less expensive to ship would be found farther away from the markets where rent was lower.
7. Von Thunen speculated that dairying and gardening of fruits and vegetables would be located close to the urban market.
8. Extensive cattle ranching, mixed arming, and orchards would be located farther away.
9. Because fruits, vegetables, and dairy products spoil more quickly, they require more sensitive forms of transportation.
10. Higher prices also for fruits, vegetables, and dairy products.
11. Because fruits, vegetables, and dairy products earn higher prices, farmers can afford to pay the higher price of rent near the market.
12. In real landscapes, this pattern is complicated for many factors, von Thunen's still describes actual patterns of agricultural land use surrounding many cities in the world.

Test Questions re: von Thunen's Model

1. The von Thunen model describes agricultural activity as it takes place in relation to the market. Which of the following statements generally represents the agricultural landscape according to the model?
   A. Agricultural activity is solely determined by the longevity of the agricultural product; thus things that don't last long are grown near the market.
   B. Goods that are expensive to transport and spoil quickly must be located closer to the market.
   C. Smaller agricultural goods like beans, herbs, and berries will be grown closer to the market than bigger goods like pumpkins.
   D. Animals will be located closer to the market, like grazing cattle and herds, because they are difficult to move.
   E. Dairy products like milk, eggs, and cheese will be far from the market as they do not cost much to transport.

2. Von Thunen's model of rural land use is based on which of the following premises?
   A. Land values decrease farther from the urban center.
   B. Land values increase farther from the urban center.
   C. Perishable goods are least valuable.
   D. Railroads provide fixed transportation costs.
   E. Vegetarianism is socially beneficial.

3. According to von Thunen's model, why is wheat farmed further from the market than dairy?
   A. People like milk more than bread.
   B. Dairy generates more revenue per acre.
   C. The climate is different near the market.
   D. Land rest is more expensive further from the market.
   E. Wheat is more expensive to transport.
A. Students must know about agriculture for 3 reasons
   1. Much of the land surface of the planet is devoted to agriculture - even some of the water crop farming
   2. Although 2% of Americans are farmers, half of all families in LDCs earn their living by farming
   3. Agriculture is a major contributor to environmental change in the form of pesticide and fertilizer run off, soil erosion, freshwater depletion, damming of rivers for irrigation purposes, and deforestation.

B. Three Periods of Technological Change have Led to the Agricultural System of Today
   1. First Agricultural Revolution
      - During Neolithic era
      - 8 to 14 thousand years ago
      - Humans first planted and harvested edible plants
      - Domesticated wild animals
      - Fertile Crescent (between Tigris & Euphrates Rivers (Iran and Iraq)
      - Archaeological evident points also to other and perhaps earlier source regions: Southeast Asia, China, Indus Valley (Pakistan), Ethiopian Highlands, Andes Mountains of SA, and Mexico/Central America
      - From these source regions, agriculture diffused to other peoples around the world
      - Irrigation, plowing, loosen and turn the soil, fencing to keep animals out of fields, building terraces, fertilizing with plant and animal waste, wedding
      - Various cultural and political practices: land tenure, division of labor between humans and animals, men and women, adults and children among different occupations
   2. Second Agricultural Revolution
      - Began in western Europe in 1600s
      - Second phrase of agro-technological change
      - Intensified agriculture in the sense of promoting higher yields per acre and per farmer
      - Improved collars for draft animals
      - Crop rotation for sustaining soil fertility
      - Heavier plows
      - Revolution began before the invention of machines
      - Industrial Revolution introduced tractors for plowing soil, reapers for cutting crops, threshers for separating grain from stalks, motors for pumping water to do the work
      - Better transport, storage, barbed wire fencing
      - Chemicals for fertilizers, herbicides (weed killers), pesticides introduced 1900s
   3. Third Agricultural Revolution - Green Revolution
      - Began in 1960s and continues today
      - Green Revolution introduced and diffused hybrid strains of staple grains by cross-pollinating different native strains of grain
      - Hybrids know as miracle rice and miracle wheat
• Mature shorter time period than conventional seeds
• Hybrids mean that farmers can grow an extra crop each year
• Hybrid crops also respond better to chemical fertilizers
• Hybrids produce more grains per plant in closer proximity to other plants
• Yields in both MDCs and LDCs increased by 50-100% in the space of a few years
• Allowed global food production to keep pace with the exponential growth of population in the 20th century.
• Some LDCs have not had the benefits of the Green Revolution - poor farmers can’t afford to invest in seeds, fertilizers, and pesticides

CRITICS of GREEN REVOLUTION: Dislike GR’s reliance on artificial fertilizers made from fossil fuels, the less flavorful grains, and the focus on corn, wheat, and rice, none of which are important crops in Africa.
• Science of genetic engineering has breathed new life into the GR
• Instead of crossing 2 varieties of plants or animals and hoping that a desirable combination of characteristics will emerge in some individuals of the next generation, genetic engineers leave little to chance
• They identify the particular genes on the DNA molecules that produce the desirable characteristics and splice the gene into the chromosomes of the other plant or animal.
• Genetically engineered products are already on the market: corn and soybeans perform very well with particular weed-killing herbicides.
• RISKS of genetically engineered Products: effect of these unnatural crops on human health and other species, such as monarch butterflies that pollinate corn. Europeans consumers in particular have rejected genetically engineered crops forcing U.S. farmers to carefully separate genetically engineered from traditional crops. Concerns focus on the potential threat to natural species from aggressive bioengineered crops. Such was the outcry when genetically modified corn was discovered in Oaxaca, Mexico, the culture hearth of domesticated corn and home to dozens of diverse corn plants.

C. Geographers look at spatial variation in WHAT crops or livestock are produced and HOW they are produced. How is this determined? WHAT FACTORS?

1. Natural environment: rice needs more water than corn and what do. Wine needs cold, wet winters, and hot, dry summers.
2. Culture - 2nd factor. No meal is complete without rice in East and South Asia or corn tortillas in Mexico. Islamic and Jewish rules are against eating pork.
3. Economic: Rational farmers produce the crop that makes the greatest profit in any particular location. Note von Thunen’s model: Location relative to the market determines what crops are grown.

D. Agribusiness: an industrialized, corporate form of agriculture, is organized into integrated networks of agricultural inputs and outputs beginning with seed, fertilizer, and pesticide production all the way through to processing and distributing food consumables. A small # of large corporations rather than a large # of independent farmers control agribusiness. Agribusinesses are increasingly extending their sources, sales, and power over a global network. The globalization of agriculture brings benefits to the consumers in the MDCs, but it also creates many negative local effects in LDCS (environment + health concerns).
BROSERUP MODEL - Conditions of Agricultural Growth under Population Growth

Ester Boserup, female agricultural geographer - Denmark - 1910-1999

Thomas Malthus's theory: The size and growth of the population depends on the food supply and agricultural methods. Put another way, according to Thomas Malthus, food grows arithmetically, but population grows geometrically. Malthus determined that food production grew arithmetically through the addition of new fields into cultivation. This type of growth most accurately follows the curve depicted by the straight line. He also believe that population grew geometrically, and that at some point, population growth would surpass food production, causing widespread starvation. We now know that food production does not follow the curve. Technological advances have allowed for increases in food production to support ever-increasing populations. In fact, inefficient distribution, not a lack of production, is the primary cause of world hunger today.

He says: increasing population = starvation, not enough crops to feed increasing population

![Graph 4](image)

Ester Broserup disagreed with Malthus's Theory.

1. She says: increasing population = positive force driving agricultural innovations that could support more people.

FIVE STAGES of Boserup

a. **Stage 1**: Forest Fallow: 20-25 years letting fields lie fallow after 1-2 years of cultivation
b. **Stage 2**: Bush Fallow: farmers cultivate the land for 2-8 years followed by a fallow period of 6-10 years
c. **Stage 3**: Short Fallow: fallow period shortens to just 1-2 years between cultivated periods.
d. **Stage 4**: Annual Cropping: leaving the land fallow for only several months between plantings
e. Stage 5: the most intensive system, multicropping the same plot bears several crops a year with little or no fallow period

2. With each stage, the land can support greater populations.
   Opposite view: each transition also involves greater depletion of soil nutrients

3. Broserup says that the increased levels of productivity would counteract the land being rendered infertile from over-use.
   Opposite view: this model produces an unsustainable land crop system

This graph shows how the rate of food supply may vary but never reaches its carrying capacity every time it is getting near because there is an invention or development that causes the food supply to increase.
Green Revolution - Definition

- Produces new strains of plants with higher yields
  (Increases agricultural productivity)
- GR brought about changes in agricultural practices
  (shift from subsistence to commercial farming)

Green Revolution - Practices

- Artificial fertilizer
- Irrigation
- Insecticides/herbicides
- Mechanical machinery
- Hybridization
- Cross-breeding
- Disease resistance crops

What does a government need to make a"GR" successful?
Notes for Chp. 10 Agriculture
Notes for Chap. 10 Agriculture