

# Unit 5: Agriculture and Rural Land-Use Patterns and Processes

Unit 5 covers how farming changes with climate, culture, and distance from markets. It covers types of farming, rural settlement patterns and land surveys, the origins and revolutions of agriculture, von Thünen's model of rural land use, the global food system, and the environmental and social effects of how food is grown.

AP Human Geography

Agriculture and Rural Land-Use

About 15 minutes to read

## How to use this guide

Read it in order the first time because the farming types in 5.1 reappear in the revolutions and in von Thünen, so learning them early pays off. The revolutions in 5.3 through 5.5 are a sequence, and 5.7 through 5.9 build on the bid-rent logic you meet in 5.6.

After the first read, use the trap boxes and the tables to review the distinctions that exam questions test most often. Finish with the practice questions, then complete the recall check on the last page out loud and note any items you cannot explain yet.

**What this unit is worth.** Agriculture and Rural Land-Use is about 12 to 17 percent of the AP Human Geography exam. It is also one of the most model-heavy units, and von Thünen, bid-rent, and the agricultural revolutions show up in both multiple-choice and free-response questions.

## 5.1 Introduction to Agriculture

Farming starts with the physical environment. Climate, soil, and water decide what can grow where, which is why Mediterranean climates support olives and grapes while tropical climates support crops like sugarcane and bananas. But the environment is only the starting point. Culture, technology, and economics decide how the land is actually farmed, and the same climate can support very different farming systems.

The key distinction in this topic is **intensive** versus **extensive** farming. Intensive farming puts high inputs of labor or capital into a small area of land. Extensive farming spreads low inputs of labor or capital across a large area. Intensity is measured per unit of land, not by total farm size.

| INTENSIVE                                                              | EXTENSIVE                                       |
|------------------------------------------------------------------------|-------------------------------------------------|
| Market gardening, plantation agriculture, mixed crop-livestock systems | Shifting cultivation, nomadic herding, ranching |
| High labor or capital per hectare                                      | Low labor or capital per hectare                |
| Near markets or on productive land                                     | Where land is cheap or poor                     |

**Trap.** Plantation agriculture is intensive even though plantations are huge. A plantation invests heavily in labor and capital per hectare to grow a single cash crop. Do not sort farming types by farm size. Sort by inputs per unit of land.

The six farming types to know: **market gardening** is small-scale intensive farming of fruits, vegetables, and flowers, usually close to a city because the produce is perishable. **Plantation agriculture** is large-scale commercial farming of one cash crop in tropical or subtropical regions, using hired labor. A **mixed crop-livestock system** combines crops and livestock on the same farm, common in the U.S. Midwest and Europe, where the crops feed the animals and the animals fertilize the crops. **Shifting cultivation** rotates fields, clearing new land, farming it briefly, then moving on while old fields lie fallow to restore fertility. **Nomadic herding** moves livestock seasonally between pastures. **Ranching** raises large herds on large ranches, typically in semiarid regions.

**Trap.** Shifting cultivation and slash-and-burn are not the same thing. Slash-and-burn is the technique of cutting and burning forest to clear a field. Shifting cultivation is the whole system, including the rotation of fields and the fallow period that restores the soil.

## 5.2 Settlement Patterns and Survey Methods

Where farmers live follows how they farm. A **clustered** settlement groups homes and buildings closely together, common where farmers share resources or want the safety of numbers. A **dispersed** settlement scatters homes widely across the landscape, common where each family works a large holding. A **linear** settlement strings homes along a road, river, or valley.

Survey methods left permanent marks on the rural landscape, and each one came with particular settlers.

| METHOD             | WHAT IT LOOKS LIKE                                                      | WHO AND WHERE                                      |
|--------------------|-------------------------------------------------------------------------|----------------------------------------------------|
| Metes and bounds   | Irregular parcels described by natural landmarks like trees and streams | English colonists, original thirteen U.S. colonies |
| Township and range | Rectangular grid of townships divided into sections                     | U.S. Public Land Survey, Midwest and West          |
| Long lot           | Long narrow lots running back from a river or road                      | French settlers, Louisiana and Quebec              |

**Trap.** Match the method to the people, not just the shape. Metes and bounds came with English colonists and their irregular parcels. The rectangular grid came later with the U.S. Public Land Survey. Long lots came with French settlers who wanted every farm to have river access. A question that names a region is really asking who settled it.

## 5.3 Agricultural Origins and Diffusions

Farming began with domestication, the first agricultural revolution, roughly 10,000 years ago. It started independently in several **hearths of domestication**, including the Fertile Crescent, the Indus River Valley, Southeast Asia, and Central America. From these hearths, crops, animals, and farming knowledge spread outward by diffusion.

The **Columbian Exchange** after 1492 was one of the largest diffusions in history. It moved plants, animals, diseases, and culture between the Eastern and Western Hemispheres. Wheat, cattle, and horses crossed the Atlantic westward. Maize, potatoes, and tomatoes crossed eastward. The exchange reshaped diets and landscapes on both sides of the ocean.

## 5.4 The Second Agricultural Revolution

The **Second Agricultural Revolution** arrived with the Industrial Revolution in the 1700s and 1800s. New machines like the seed drill and the mechanical reaper, better crop rotation, and the enclosure of common lands in Britain raised food production sharply. Better diets and longer life expectancies followed. Because fewer workers were needed on farms, labor was freed up for factory work, and that labor shift is what ties the Second Agricultural Revolution to industrialization.

**Trap.** Keep the revolutions in order by date and content. The first is domestication, about 10,000 years ago. The second is mechanization in the 1700s and 1800s, tied to the Industrial Revolution. The Green Revolution is high-yield seeds in the developing world in the mid-1900s. Exam questions often swap the details between the second and the Green, so anchor each one to its century.

## 5.5 The Green Revolution

The **Green Revolution** began in the mid-twentieth century when plant scientists developed high-yield seed varieties, first for wheat in Mexico and then for rice in Asia. Combined with chemical fertilizers, pesticides, irrigation, and mechanization, these seeds greatly increased food production in the developing world and reduced hunger.

The consequences cut both ways. On the positive side, yields rose and fewer people went hungry. On the negative side, heavy chemical use and irrigation damaged the environment, and many small farmers went into debt buying the seeds and inputs the new system required.

**Trap.** The Green Revolution is not an unqualified success story on the exam. Know both sides. Higher yields and less hunger on one side, environmental damage and debt for small farmers on the other. A question that asks for a negative consequence is usually pointing at one of those two.

## 5.6 Agricultural Production Regions

The basic split in this topic is purpose. **Subsistence agriculture** grows food mainly to feed the farmer's own family, with little surplus to sell. **Commercial agriculture** grows products mainly to sell for profit, usually at large scale. The two can exist side by side in the same country, and the same crop can be subsistence in one place and commercial in another.

**Monocropping**, growing a single crop over a large area year after year, is a commercial strategy that raises efficiency but also raises risk. One pest or disease can wipe out the entire harvest, and growing the same crop every year depletes the same soil nutrients.

**Bid-rent theory in agriculture** explains where intensive and extensive farming locate. Land near the market is bid up to high prices, so it goes to intensive uses that earn enough per hectare to pay the rent. Cheaper land farther out goes to extensive uses. Distance from market sorts farming by intensity, which is the same logic von Thünen formalized in 5.8.

**Trap.** Subsistence and commercial describe purpose, not technology. A subsistence farm can use modern tools, and a commercial farm can be low-tech. When a question asks you to classify a farm, look at what happens to the harvest. Eaten by the family means subsistence. Sold for profit means commercial.

## 5.7 Spatial Organization of Agriculture

A **commodity chain** is the full sequence linking production and consumption of an agricultural product, from farm inputs through growing, processing, and distribution to the consumer. Tracing one product through its chain shows where value is added and who captures it. Most of the profit in a chain sits with processing and retail, not with the farmer.

**Agribusiness consolidation** is the trend of large commercial operations replacing small family farms as technology creates economies of scale. Bigger machines, bulk input purchases, and direct contracts with processors all favor size, and the family farm struggles to compete on cost.

Technology has also raised **carrying capacity**, the maximum population or output an area can support. Mechanization, fertilizers, and irrigation increased yields and let farms operate at larger scales, so the same land now supports more people than it could before.

## 5.8 Von Thünen Model

**Von Thünen's model** explains rural land use around a single market town. Johann Heinrich von Thünen published it in 1826. The model assumes an isolated state with one central market, a flat and uniform plain, no rivers or roads, and farmers who want to maximize profit. The only variable is distance from the market, and distance matters because transport costs rise with distance.

Perishable or heavy goods cannot afford long trips, so they locate near the town. Durable goods, and animals that can move themselves, locate farther out. The result is a set of concentric rings, and land rent falls with distance because each ring is where its land use can outbid the others.

| RING | LAND USE                      | WHY IT IS THERE                                                        |
|------|-------------------------------|------------------------------------------------------------------------|
| 1    | Market gardening and dairying | Fruits, vegetables, and milk are perishable and must reach market fast |
| 2    | Forest                        | Firewood and timber are heavy and costly to transport                  |
| 3    | Field crops, mainly grains    | Storable and less perishable, so they tolerate the longer trip         |
| 4    | Ranching                      | Livestock can walk to market, so transport is cheapest                 |

Beyond the ranching ring lies wilderness, land too far from market to farm profitably.

**Trap.** The rings follow transport cost and perishability, not climate or soil. Dairying sits in ring 1 because milk spoils, not because the soil near town is better. Also know the model's limits. Regions of specialty farming do not always fit the rings, and modern refrigeration and trucking have weakened the perishability constraint that the whole model rests on.

## 5.9 The Global System of Agriculture

Food moves through a **global agricultural supply chain** that links regions of production to regions of consumption. Coffee grown in Colombia is roasted, packaged, and sold in the United States. That chain creates dependence in both directions. Producers depend on distant buyers, and consumers depend on distant growers.

**Export commodity dependence** happens when a country relies heavily on one or two export commodities. That dependence leaves the country exposed. When world prices swing, government revenue, farm income, and the whole economy swing with them.

## 5.10 Consequences of Agricultural Practices

Farming reshapes the landscape. **Slash-and-burn agriculture** cuts and burns forest to create fields. **Terracing** carves flat steps into hillsides so slopes can be farmed with less erosion. **Irrigation** brings water to dry fields but can leave salts behind in the soil, a process called salinization. **Deforestation** clears forest for crops or pasture. **Draining wetlands** removes water from marshy areas for farming or settlement. **Pastoral nomadism** moves herds across large areas, altering the vegetation they graze.

The broader **environmental effects** include pollution from fertilizers and pesticides, land cover change, desertification, and soil salinization, alongside conservation efforts that try to limit the damage. The **societal effects** include changing diets as commercial agriculture spreads, the role of women in food production, and the economic purposes that farming serves in a society.

**Trap.** Terracing is a response to erosion, not a cause of it. And irrigation's hidden cost is salinization. When a question asks for an unintended consequence of irrigation, salinization is usually the answer it wants.

## 5.11 Challenges of Contemporary Agriculture

**Biotechnology** uses living organisms or their products to modify crops. **Genetically modified organisms** are crops whose DNA has been altered in a lab. Both are debated over sustainability, biodiversity, soil and water use, and chemical dependence. **Aquaculture**, the farming of fish, shellfish, or aquatic plants, raises its own questions about sustainability and environmental effects.

Several movements reflect individual food choices. **Organic farming** avoids synthetic fertilizers and pesticides. **Community-supported agriculture** lets consumers buy shares of a local farm's harvest in advance. **Fair trade** guarantees producers in developing countries a fair price. **Urban farming** grows food inside cities. **Local-food movements** promote growing and eating food close to home, partly as a response to urban economic and social problems. **Value-added specialty crops** are processed or marketed to raise their price. **Dietary shifts** are changes in what people eat, and they reshape demand across the whole system.

**Trap.** These movements are about consumer and producer choices, not government policy. Fair trade is about the price producers receive, not about where the food is grown. Organic is about inputs, not about scale. If a question asks which of these the CED names as individual-food-choice movements, the list above is the set.

**Food insecurity** means people lack reliable access to enough nutritious food. A **food desert** is an urban area where residents cannot get affordable fresh food, usually because grocery stores are absent. The problem in a food desert is access, not that no food exists at all. Economic forces shape production too. The **economic effects on food production** include where processing plants and markets are located, economies of scale, distribution systems, and government policies like subsidies, all of which push production toward certain places and practices.

**Trap.** A food desert is an urban access problem. Do not confuse it with rural hunger or famine. The defining feature is the absence of stores selling affordable fresh food in a city neighborhood.

## 5.12 Women in Agriculture

The role of **women in food production**, distribution, and consumption varies from place to place, depending on the type of production involved. In many subsistence systems women do most of the farm work, while commercial systems have historically been male-dominated. Exam questions on this topic usually ask you to connect gender roles to the agricultural system in a specific region, so practice explaining the link rather than memorizing a single pattern.

# Practice Questions

Original questions written for this guide in the style of the AP exam. Answers and explanations are on the next page, so complete the questions before checking them.

**1.** In von Thünen's model, which land use is located in the ring closest to the market town?

- A. Ranching
- B. Grain farming
- C. Market gardening and dairying
- D. Commercial forestry

**2.** In colonial Virginia, land parcels were irregular in shape and described in deeds by reference to trees, rocks, and streams. Which survey method does this describe?

- A. Township and range
- B. Long lot
- C. Metes and bounds
- D. Linear settlement pattern

**3.** Which statement correctly distinguishes the Second Agricultural Revolution from the Green Revolution?

- A. The Second Agricultural Revolution introduced high-yield seeds to the developing world.
- B. The Green Revolution freed farm labor for factory work during industrialization.
- C. The Second Agricultural Revolution brought mechanization in the 1700s and 1800s, while the Green Revolution brought high-yield seeds and chemicals to the developing world in the mid-1900s.
- D. Both revolutions took place before 1900.

**4.** Plantation agriculture covers large areas, yet it is classified as intensive farming. Why?

- A. Because plantations are located close to urban markets
- B. Because intensity is measured by inputs of labor or capital per unit of land, and plantations invest heavily per hectare
- C. Because plantations grow food mainly for the farmer's own family
- D. Because plantations avoid the use of machinery

## Answer Key

**1. C.** Market gardening and dairying produce perishable goods with high transport costs, so they locate in the innermost ring. A is wrong because ranching sits in the outermost ring; livestock can walk to market, which makes its transport cheapest. B is wrong because grain is storable and less perishable, placing it in ring 3. D is wrong because forestry occupies ring 2; wood is heavy and costly to move, but it does not spoil, so it sits outside the perishable zone.

**2. C.** Metes and bounds describes irregular parcels by natural landmarks, and it came to Virginia with English colonists. A is wrong because township and range produces regular rectangular parcels in the Midwest and West. B is wrong because the long lot system created long narrow river lots for French settlers in Louisiana and Quebec. D is wrong because a linear settlement pattern describes how homes are arranged along a road or river, not a method of surveying land.

**3. C.** The Second Agricultural Revolution brought mechanization, enclosure, and rising output in the 1700s and 1800s, while the Green Revolution brought high-yield seeds, chemicals, and irrigation to the developing world starting in the mid-twentieth century. A describes the Green Revolution, not the Second. B describes the Second Agricultural Revolution, not the Green. D is wrong because the Green Revolution began in the mid-1900s.

**4. B.** Intensity is defined by inputs of labor or capital per unit of land, and a plantation invests heavily per hectare to grow its single cash crop. A is wrong because plantations sit in tropical and subtropical regions, often far from the markets they serve. C describes subsistence agriculture, the opposite of plantation farming. D is wrong because plantations are capital-intensive operations that use machinery where it pays.

# One-Page Recall Check

- Explain how climate shapes what can be grown in a region, with one example.
- Define intensive and extensive farming, and explain why plantation agriculture counts as intensive.
- Distinguish shifting cultivation from slash-and-burn.
- Describe the three rural settlement patterns and match each survey method to its settlers and region.
- Name two hearths of domestication and explain what the Columbian Exchange moved in each direction.
- List the three agricultural revolutions in order, with dates and the key change in each.
- Explain how the Second Agricultural Revolution connected to industrialization.
- Give one positive and one negative consequence of the Green Revolution.
- Distinguish subsistence from commercial agriculture, and explain the main risk of monocropping.
- Explain bid-rent theory in agriculture in one or two sentences.
- Define commodity chain and agribusiness consolidation.
- Define carrying capacity and explain how technology raised it.
- Draw and label the von Thünen rings from the center out, with the reason for each ring's position.
- State two assumptions of the von Thünen model and one limitation.
- Explain export commodity dependence and the risk it creates.
- Name three ways farming alters the landscape, and explain how irrigation can damage soil.
- Distinguish biotechnology from GMOs, and name three individual-food-choice movements.
- Distinguish food insecurity from a food desert.
- Explain how the role of women in food production varies with the type of agriculture.

**Where to go next.** Turn every missed item above into flashcards and drill them spaced out over several days rather than in one sitting. In Rycal, open the Agriculture and Rural Land-Use deck under AP Human Geography. The deck covers the terms in this guide, and its practice questions target the same traps named here. If you have a test date, add it in the Test Planner. You can also start your next review with a Brain Dump, then check what you missed against this guide.

## Key terms for this unit

Agriculture and physical geography, Intensive farming, Extensive farming, Market gardening, Plantation agriculture, Mixed crop-livestock system, Shifting cultivation, Nomadic herding, Ranching, Clustered settlement, Dispersed settlement, Linear settlement, Metes and bounds, Township and range, Long lot, Hearths of domestication, Columbian Exchange, Agricultural revolutions, Second Agricultural Revolution, Green Revolution, Green Revolution consequences, Subsistence agriculture, Commercial agriculture, Monocropping (monoculture), Bid-rent theory in agriculture, Commodity chains, Agribusiness consolidation, Technology, scale, and carrying capacity, Von Thünen model, Global agricultural supply chain, Export commodity dependence, Environmental effects of agriculture, Slash-and-burn agriculture, Terracing, Irrigation, Deforestation, Pastoral nomadism, Societal effects of agriculture, Draining wetlands, Biotechnology, Genetically modified organisms (GMOs), Aquaculture, Organic farming, Community-supported agriculture (CSA), Fair trade, Food insecurity, Food desert, Economic effects on food production, Urban farming, Value-added specialty crops, Local-food movements, Dietary shifts, Women and food production.