



5.8 Von Thunen Model

Objective and Essential Learning

Describe how the von Thunen model is used to explain patterns of agricultural production at various scales.

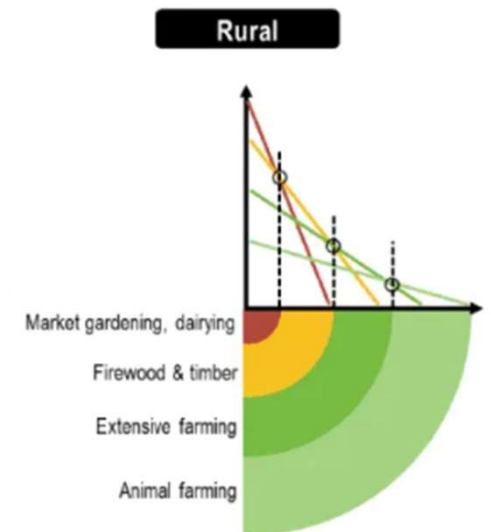
- Von Thunen's model helps to explain rural land use by emphasizing the importance of transportation costs associated with distance from the market; however, regions of specialty farming do not always conform to von Thunen's concentric rings.



Bid-Rent Theory

Bid-Rent Theory: The value of land is influenced by its relationship to the market.

- Most desirable and accessible land is near the market and costs the most money.
 - Farmers are able to purchase LESS land so farming is typically INTENSIVE in order to earn a profit.
- The least desirable and accessible land is located the furthest from the market and costs the least money.
 - Farmers are able to purchase MORE land and farming is typically EXTENSIVE and can earn a profit.



Von Thunen's Model for Rural Agricultural Land Use

Context

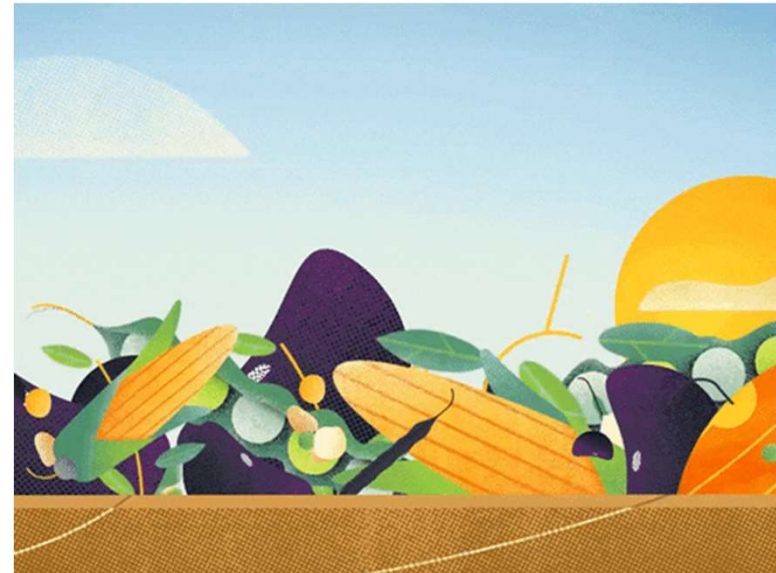
- North German farmer & economist
- Published, "An Isolated State" in 1826
- Spatial patterns of farming practices in his community.



Von Thunen's Model for Rural Agricultural Land Use

Assumptions

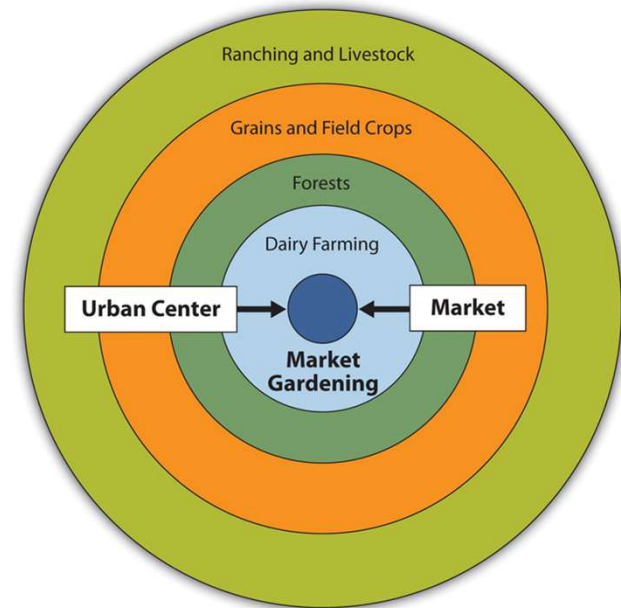
- Isotropic Plane: All land is flat and the physical environment is the same everywhere.
- No barriers to transportation.
- Farmers using ox carts to transport goods to market.



Von Thunen's Model for Rural Agricultural Land Use

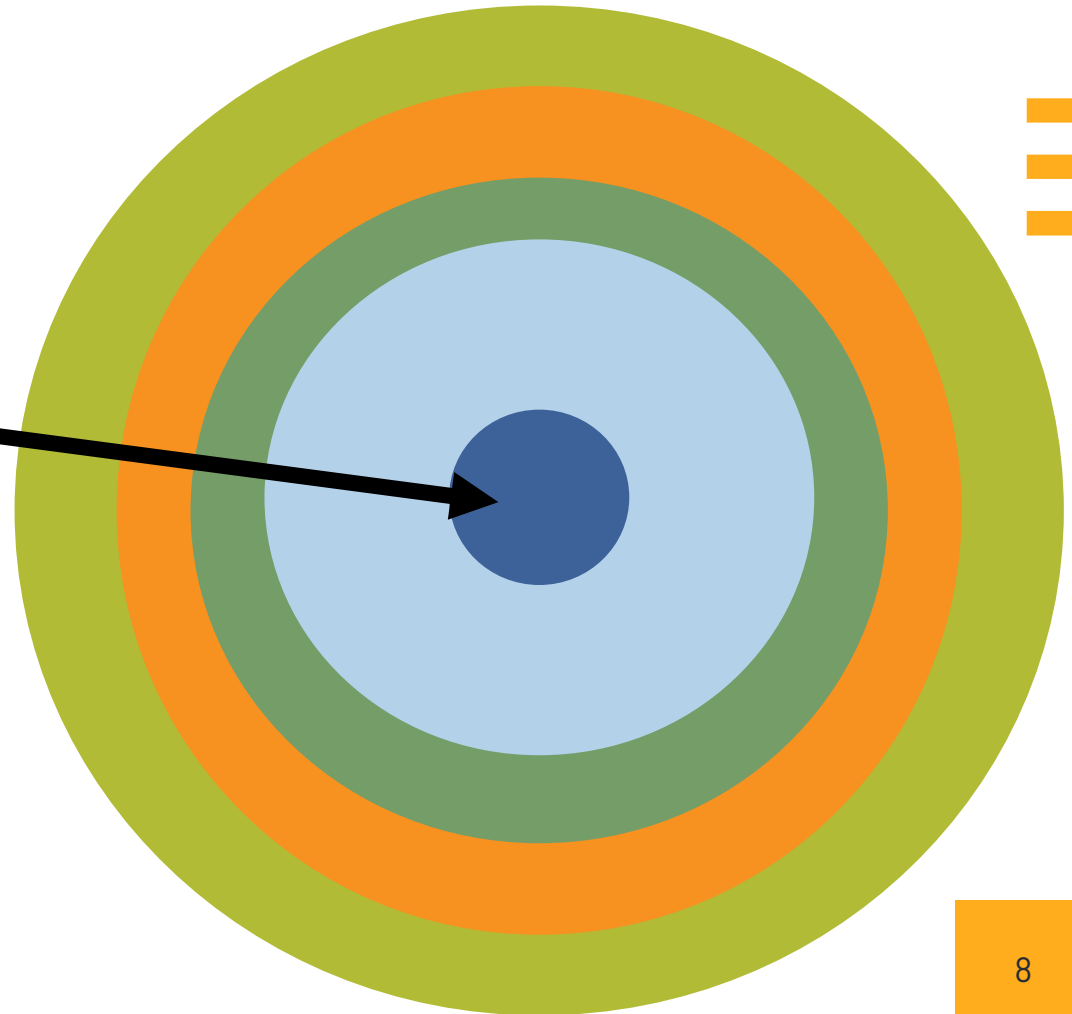
Major Idea:

- Transportation costs are proportional to the distance from the market.
- The perishability of the product and transportation costs to the market factor into a farmer's decisions regarding agricultural practices.



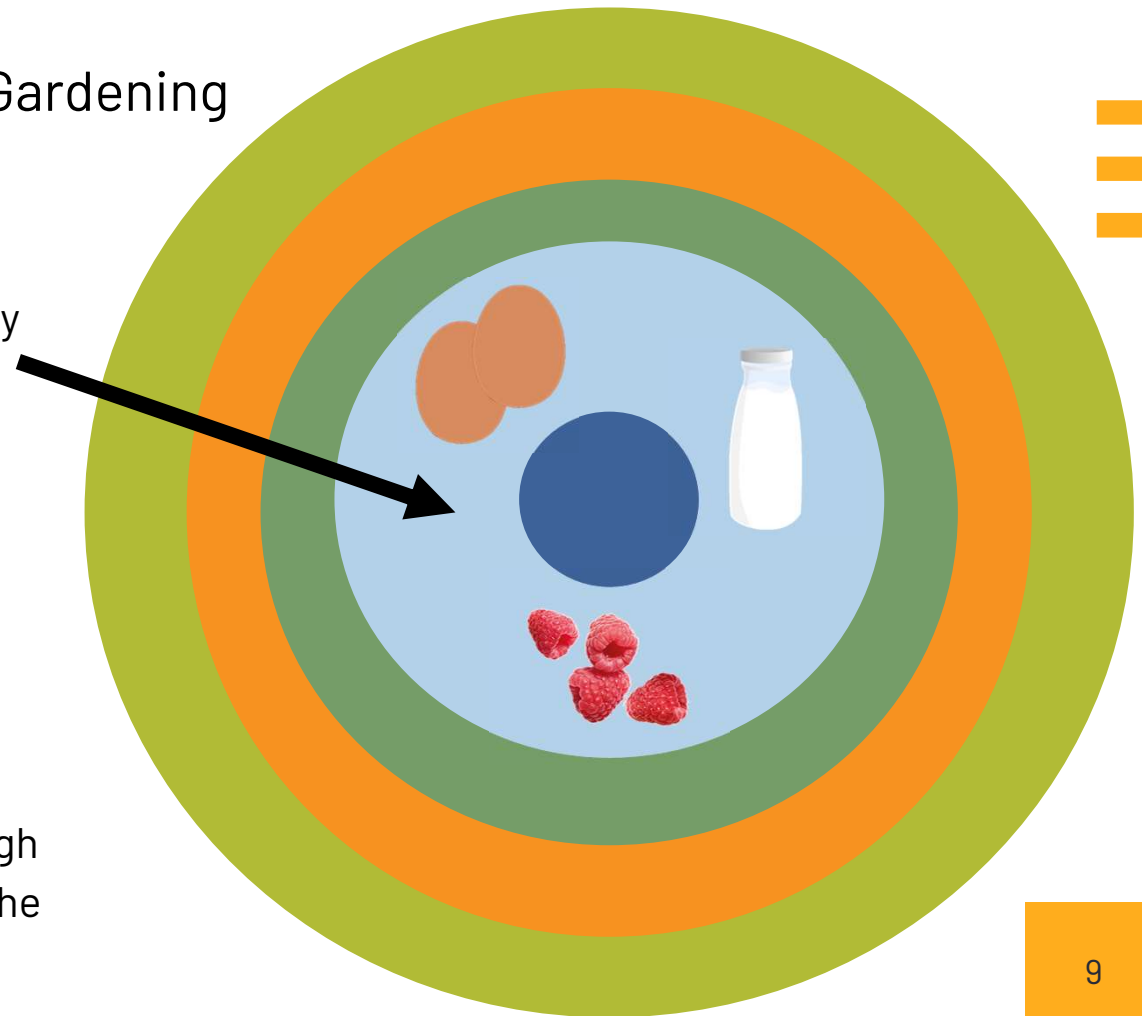
Market/Urban Center

- Assumed that there was a market located in an isolated, self-sufficient state without external influences.
- Assumed commercial agricultural system in which farmers will maximize their profits.
- Assumed that there was a single market destination for farmers' harvest.



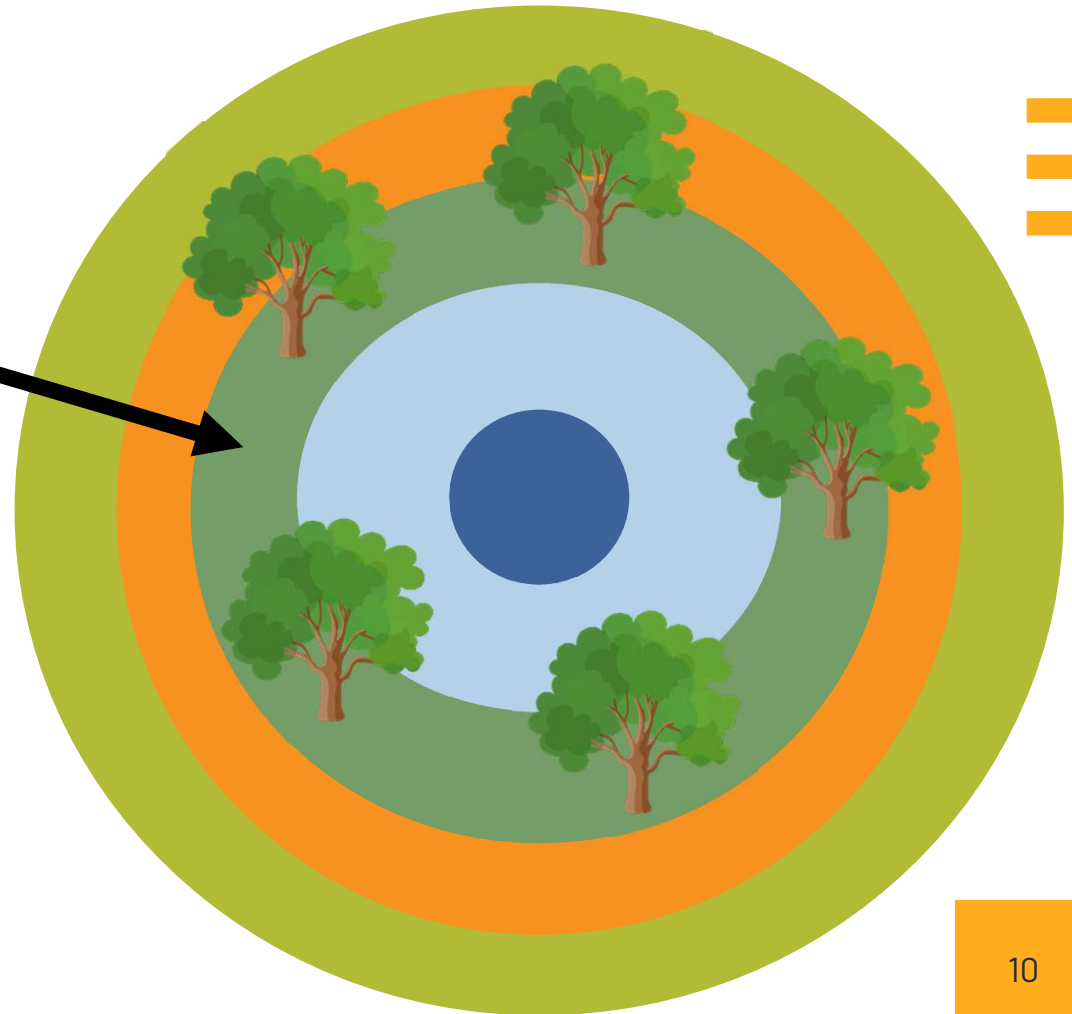
Dairy Farming & Market Gardening

- Crops: Dairy & Produce
- Perishability: Milk and produce spoil easily, so they must be located near the markets to ensure fresh products.
- Transportation: Difficult to transport and must be transported quickly due to perishability.
- Intensive farming due to high value of land located near the central market.



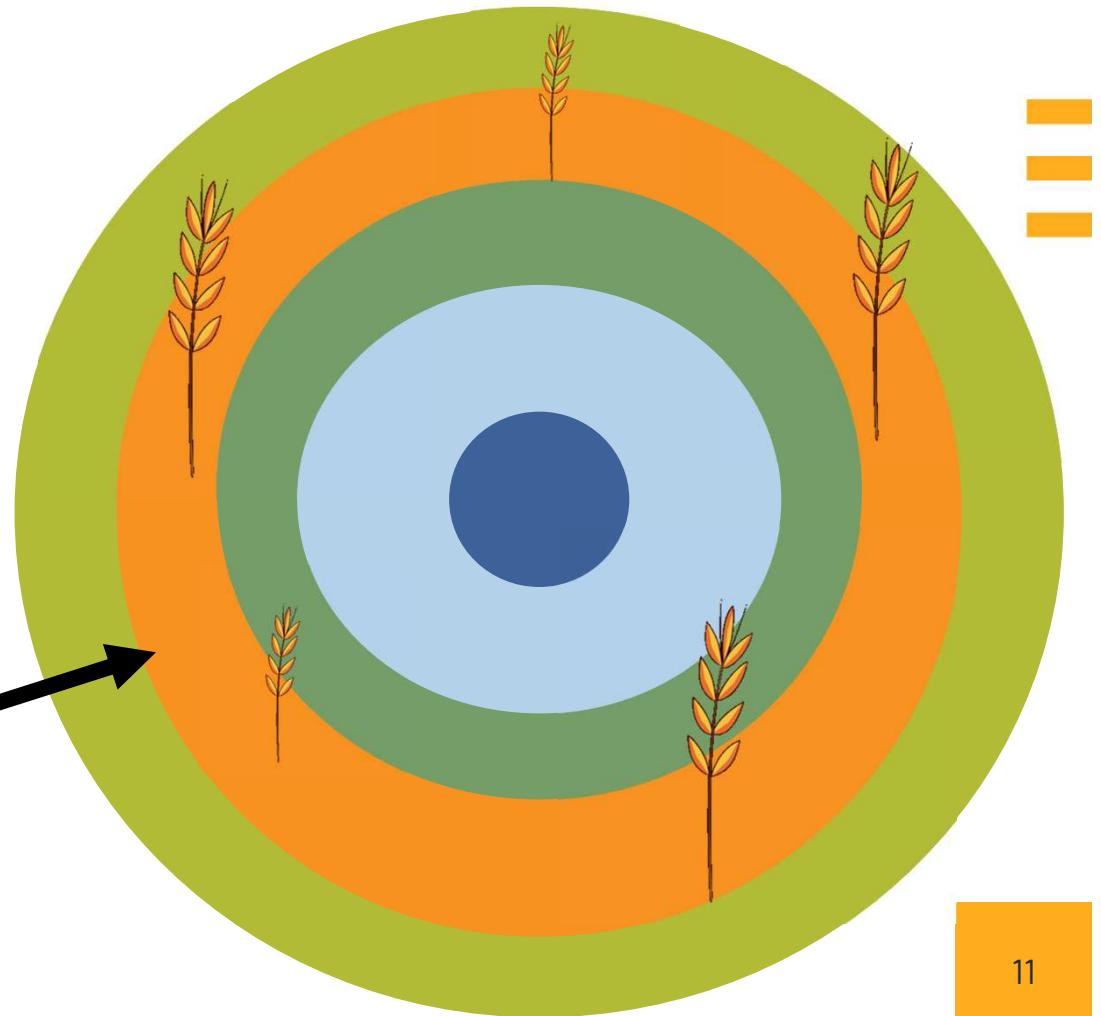
Forests

- Crops: Timber
- Perishability: Not perishable
- Transportation: Difficult and expensive to transport, very heavy
- Firewood was an essential good in the 1800s in order to build fires for cooking, heating homes, and as a building material.



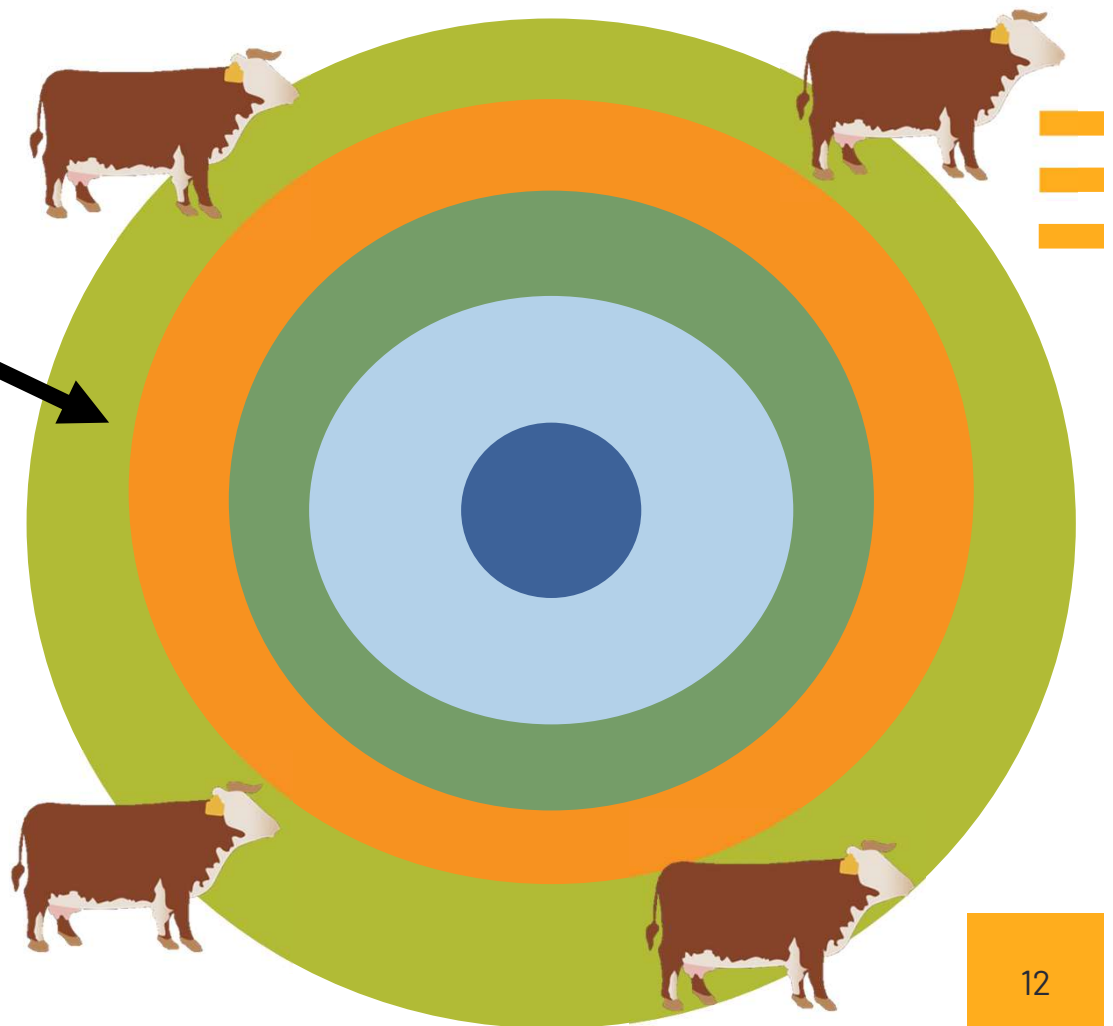
Grains and Cereal Crops

- Crops: Grains & Cereals
- Perishability: Less perishable
- Transportation: Not fragile, bulky, or heavy. Easier transportation to the market.
- Extensive farming becomes profitable due to the cost of the land (distance from market).



Livestock Ranching

- Livestock
- Perishability: Not perishable while they are alive!
- Transportation: Very low cost because animals were walked to the market.
- Land is less desirable due to distance from the market. This makes it less expensive, so ranchers can rent or buy large quantities to herd their animals.



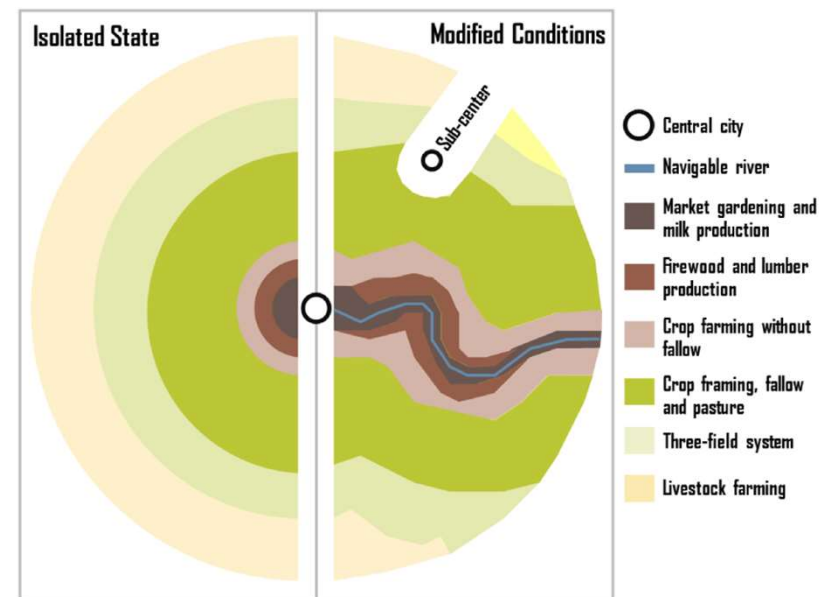
The Limitations of von Thunen's Model

- Multiple market centers across the world today -> global supply chain.
- Food preservation techniques such as tin cans and refrigeration
- Improved transportation infrastructure! Complex networks of shipping cargo cars via ship, train, roads, and air routes.
- Government policies about land use or to encourage growth of a particular crop.



The Limitations of von Thunen's Model

- Wood is no longer used as the major source of heating, cooking, or building material.
 - Forests are no longer near communities.
- Non-Isotropic Planes: Physical features impact the shape of the model.



The Limitations of von Thunen's Model

- Speciality Farming: Regions of particular climates and soil types like Mediterranean agriculture are missing from the model!

