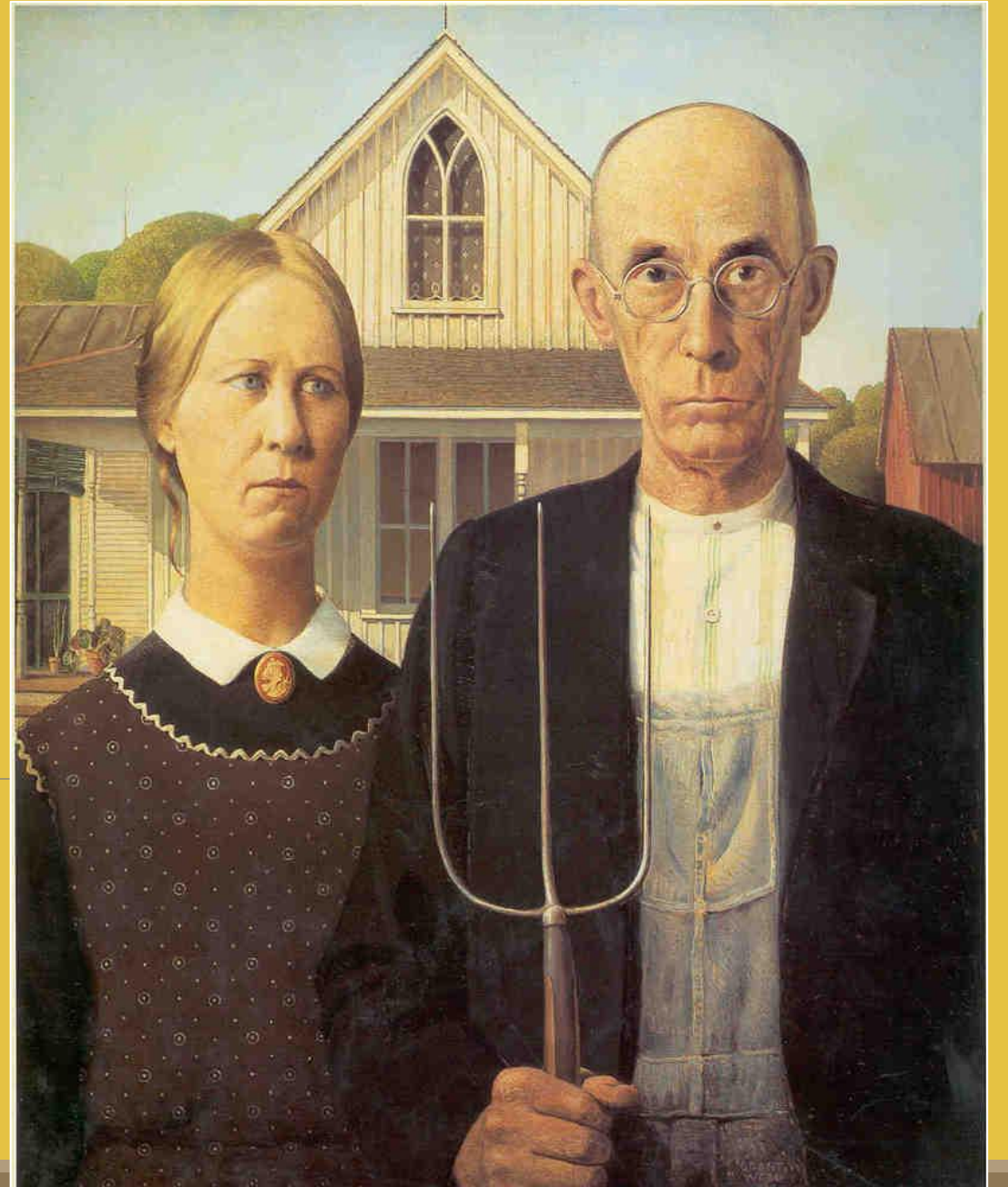


# Agricultural Revolutions

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American Gothic, Grant Wood (1930)

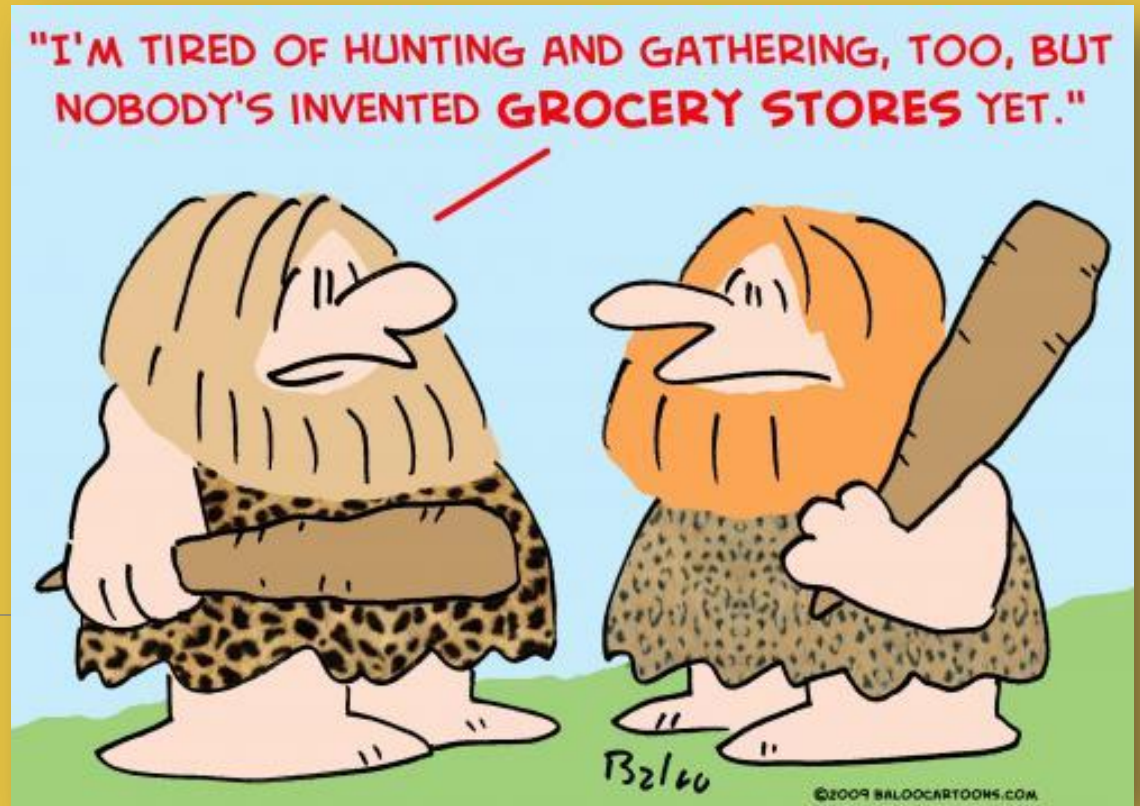
# Key Questions

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- How did we go from Hunters & Gathers to the city dwellers?
- What caused the Second Agricultural Revolution?
- Is it easy being green? What was the **Green** Revolution?
- Modern Agriculture? What?

# THE NEOLITHIC REVOLUTION

(aka the 1<sup>st</sup> Agricultural Revolution)



# Neolithic Revolution (aka the 1<sup>st</sup> Revolution) – When?

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- In the beginning ...  
We were **Hunters & Gathers**
- What changed?  
**Cultivation of plants and the domestication of animals.**
- What was the result?  
**The ability to settle.**
- These drastic changes in human life are known collectively as the **NEOLITHIC REVOLUTION** (8000 B.C.E.).

Video: *Story of Us - Birth of Farming*  
<https://www.youtube.com/watch?v=bhzQFIZuNFY>



# Neolithic Revolution (aka the 1<sup>st</sup> Revolution) – Where?

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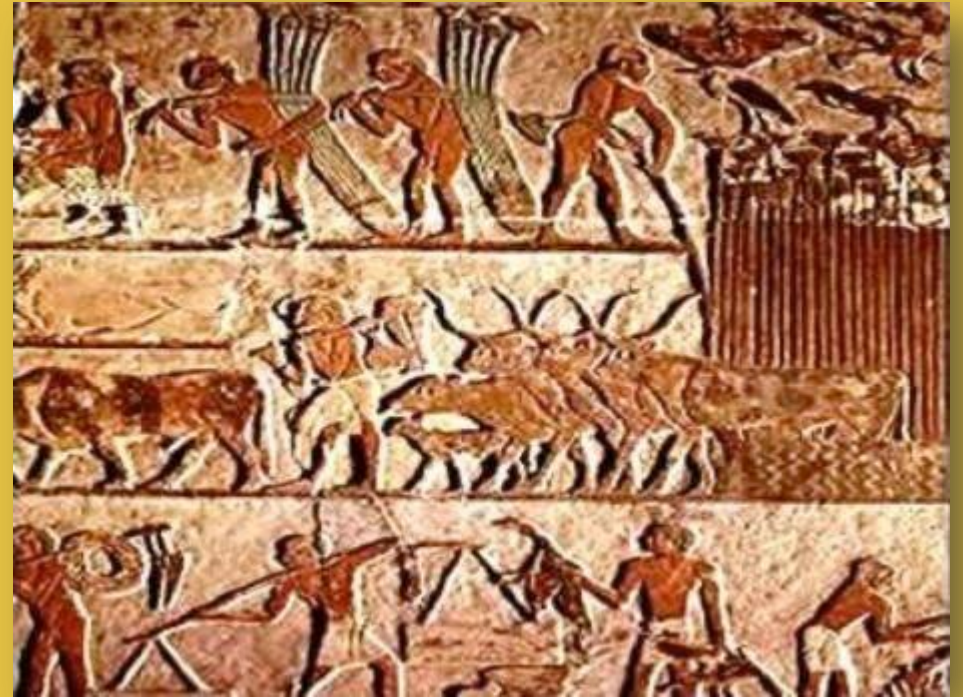
- **Agricultural hearths** developed independently in several regions of the world over a long period of time.
- From these agricultural hearths, farming practices **diffused** across the earth.
- Carl Sauer identified **3 Hearths for Seed Agriculture** in the Eastern Hemisphere.

Those hearths were:

**Southwest Asia (Western India)**

**Southeast Asia (Northern China)**

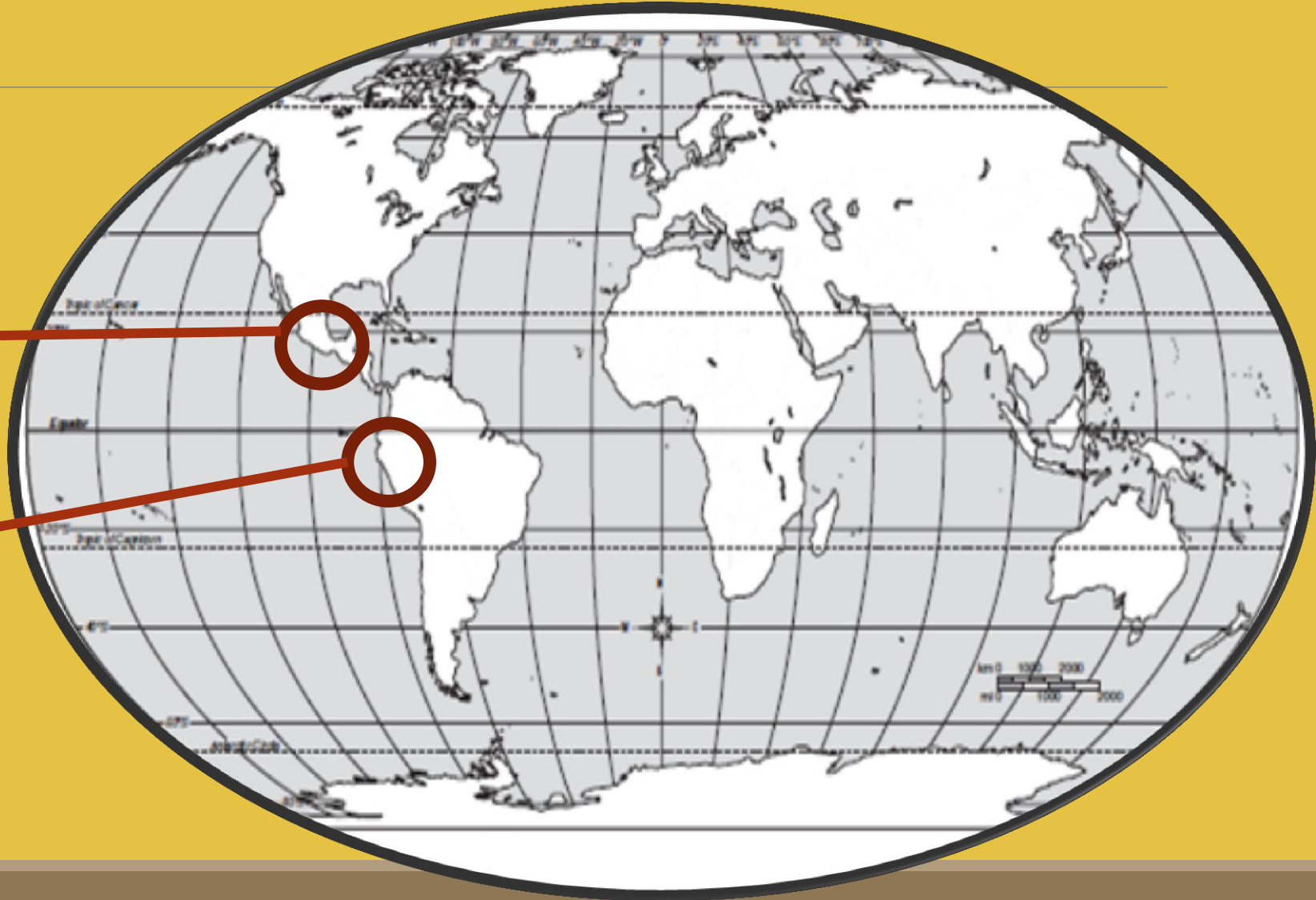
**East Africa (Ethiopia)**



# Additional Hearths of Crops – *Western Hemisphere*

- **Southern Mexico:** squash, potato, cocoa and maize (aka corn)

- **Peru:** beans, cotton, and squash



# Hearths of Crops – *Eastern Hemisphere*



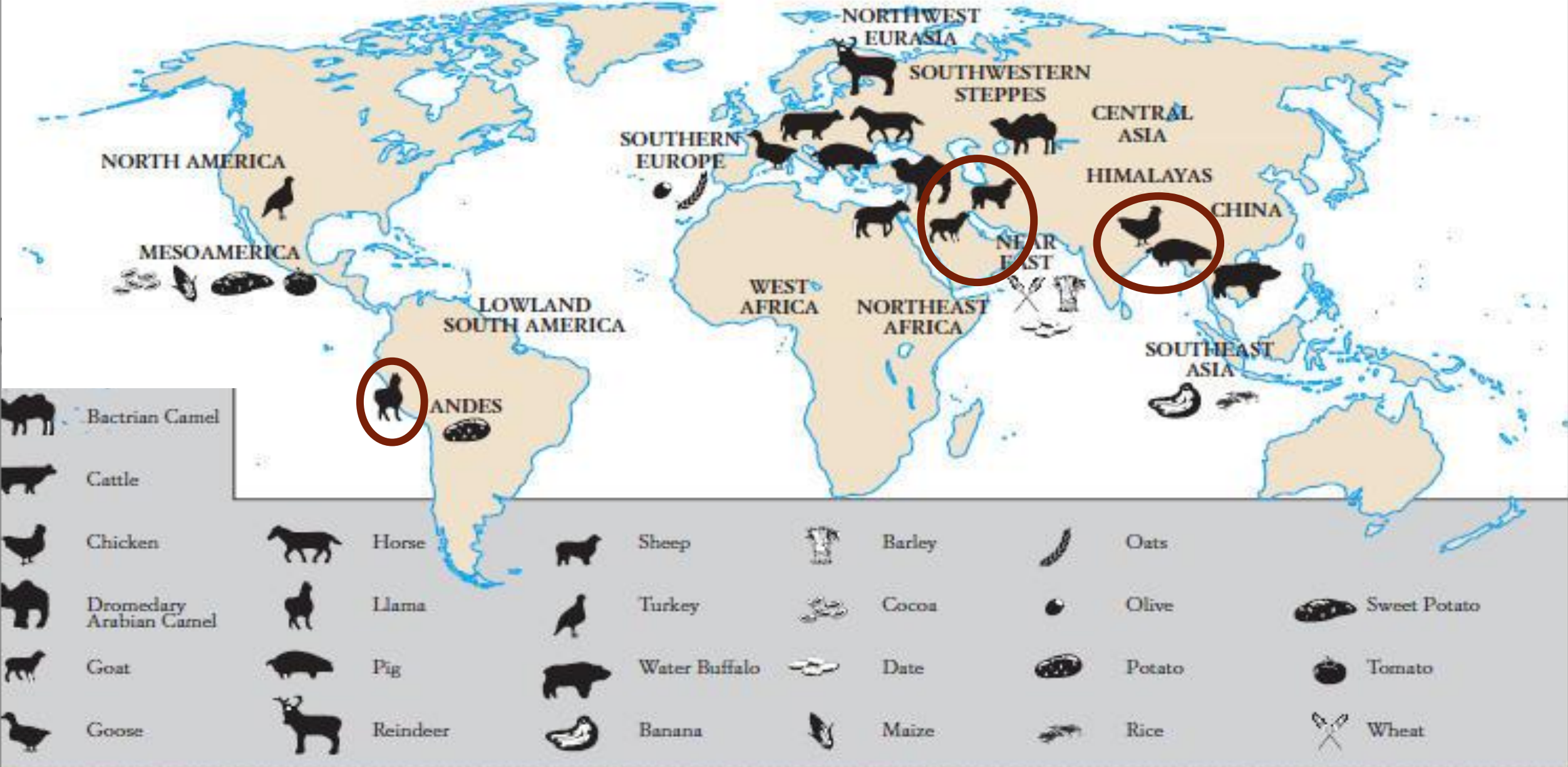
- **Southwest Asia:** barley and wheat

- **Ethiopia:** millet and sorghum

- The cultural hearth of rice is unknown, but it probably was Southeast Asia.



# Hearths of Animals– *Baa-baa, Moo-moo, and Oink-oink!*





# Seed Agriculture – *Mother of Innovation*

Over the years many **Innovations** increased the chances of success for seed agricultural practices.

These innovations included:

- **Irrigation** (the channeling of water to fields)
- **Plowing** to loosen and turn the soil
- **Fencing** to keep animals out of fields
- building **Terraces** to provide level field on hillsides
- **Fertilizing** with plant and animal waste
- **Weeding**



# Changes because of the Neolithic Revolution

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- Increase in *reliable* **food supplies**
- Rapid increase in **total human population**

**What stage of the DTM is this?**

- **Job specialization**
- **Development of distinction between settled people and nomads**
- **Widening of gender-specific activities**
  - Men:** agricultural production and domestication of animals
  - Women:** child-rearing, food preparation, and care of home

# THE SECOND AGRICULTURAL REVOLUTION

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Because the 1<sup>st</sup>  
wasn't enough?

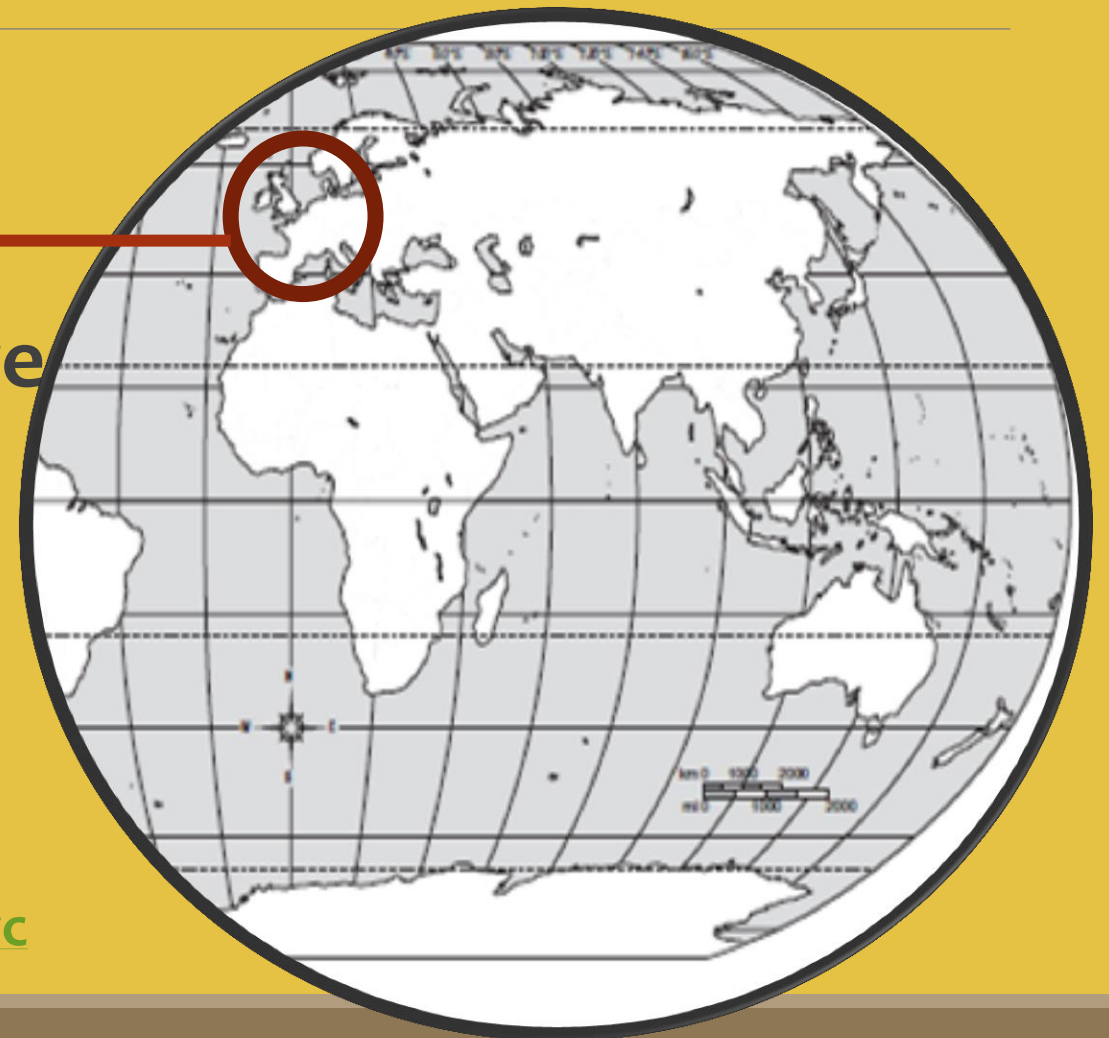


# Second Agricultural Revolution – When & Where?

- **Second Agricultural Revolution** began in Western Europe in the 1600s.
- It promoted **higher yields** per acre and per farmer.
- Help start the **Industrial Revolution**, making it possible to feed rapidly growing cities.

Video: Crash Course – *Industrial Revolution*

<https://www.youtube.com/watch?v=3Efq-aNBkvc>



# Second Agricultural Revolution

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## Changes and Innovations:

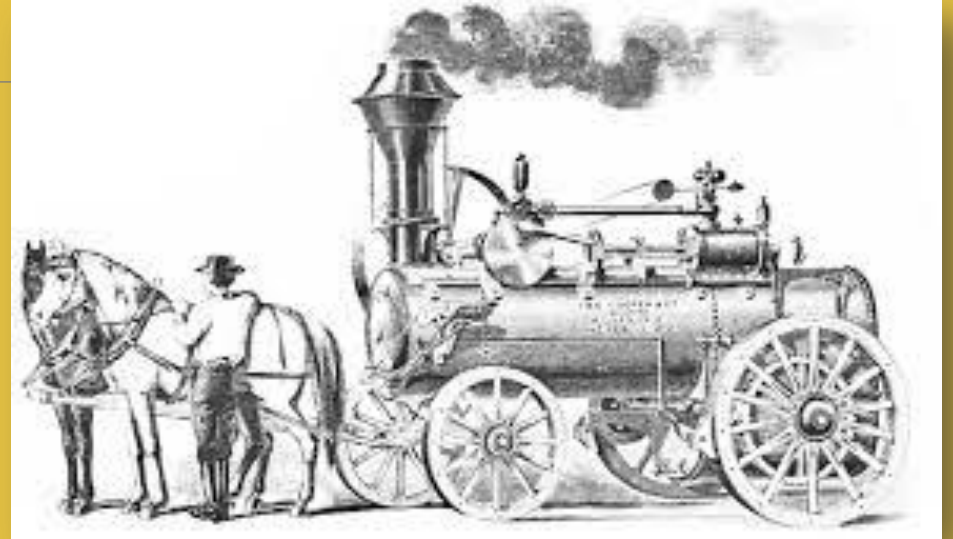
- increased use of **fertilizers**
- Wealthy landowners in England began to enlarge their farms through **enclosure: fencing or hedging** blocks of land for experiments with new techniques of farming. Process called the “Enclosure Movement”
- improved **crop rotation**, which carefully controlled the nutrients in soil
- bred **better livestock**
- invented such machines as the **seed drill** for more effectively planting seeds (Jethro Tull)
- Better nutrition boosted England’s population, creating the first necessary component of the Industrial Revolution: **LABOR!**

# Talking about the Industrial Revolution...

Once the **Industrial Revolution** began, farming methods became more efficient.

Examples:

- **Tractors for plowing soils**
- **Reapers for cutting crops**
- **Threshers for separating grain from stalks**
- **Motors for pumping water**

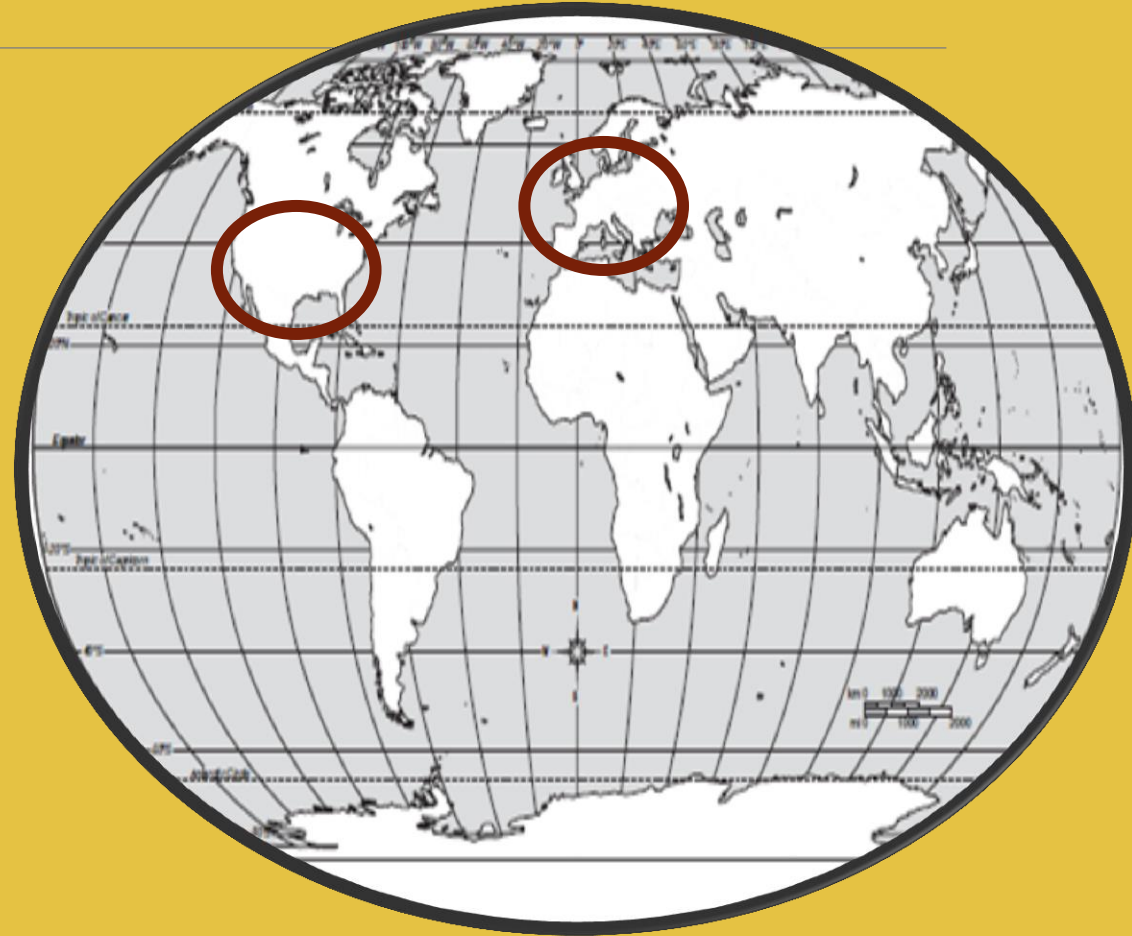




# Second Agricultural Revolution ~ the later years (20<sup>th</sup> Century)

Continues Changes and Improvements:

- **Transportation for and storage of crops** improved, especially with the invention of **refrigerated** cars and ships.
- **Industrially-produced chemicals for fertilizers, weed killers, and pesticides** were also introduced in the 20<sup>th</sup> century.



# THE GREEN REVOLUTION (Modern Agriculture)



# The **Green** Revolution (Modern Agriculture)

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By the 1970s, the collection of new agricultural techniques was called the **Green Revolution**, which involved **two important practices**:

- the *use of new higher-yield seed (GMOs)*
- the **expanded use of fertilizers**

The **Green** Revolution has resulted in **agricultural production outpacing population growth** by the late 20<sup>th</sup> century.

Take that Malthus!!!!

The dramatic changes brought about the **Green** Revolution have been both **praised** and **criticized**.





# The **Green** Revolution Praise & Critics : *General Overview*

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## PRAISE

- **Famines** that have occurred throughout history can now be **avoided**, since agricultural production now outpaces population growth.

## CRITICISMS

- **Poor** farmers **cannot** always **afford** the items necessary to get new foods to citizens such as:
  - **Machinery**
  - **Seeds (GMOs)**
  - **Fertilizers**

# The **Green** Revolution Praise & Critics : *Fertilizers*

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## PRAISE

- Nitrogen-based **fertilizers** have **increased farm productivity** in many countries of the world.

## CRITICISMS

- Farmers in **poorer** countries **cannot** afford the fertilizers.
- Fertilizers have also led to **groundwater pollution** and the **reduction of organic matter** in the **soil**.

# The **Green** Revolution Praise & Critics : *Food*

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## PRAISE

- Scientists continue to **invent new food** sources including:
  - higher-protein **cereals**
  - cultivating the oceans
  - improving the palatability of rarely consumed foods

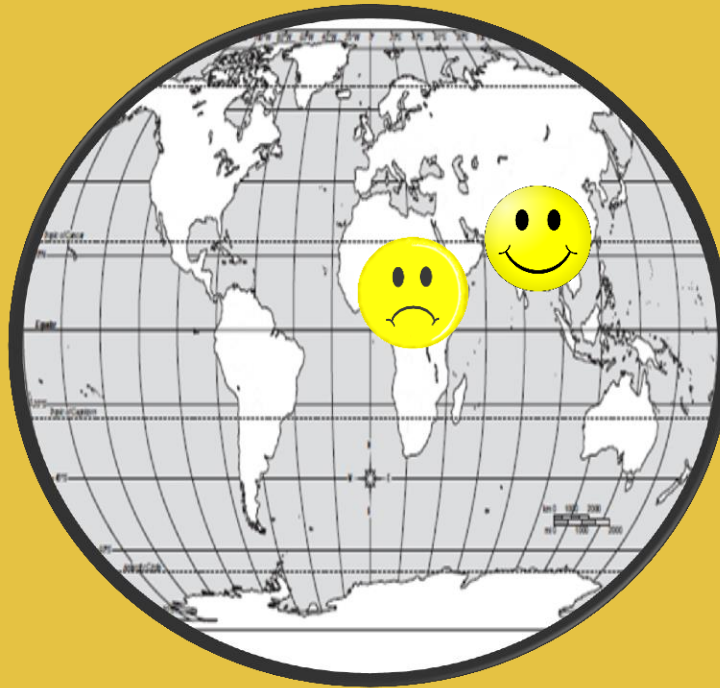
## CRITICISMS

- Many **fishing** areas are **over-fished**.
- **Cultural preferences** (taboos and religious reasons) shape food consumption and production of rarely eaten foods will not change eating habits.

# The **Green** Revolution Praise & Critics : *Food*

## PRAISE

- Higher productivity is primarily responsible for **reducing dependency** on imports in Asia, including China and India.
- In both areas populations are balanced fairly well with food resources.



## CRITICISMS

- Many people in **Sub-Saharan Africa** are not getting enough to eat, with millions of people facing **famine**.
- **Green** Revolution techniques have made too few inroads, and **population** is **increasing faster** than **food production**.



# The **Green** Revolution Praise & Critics : *Agribusiness*

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## PRAISE

- Agribusiness has **increased** the productivity of **cash crops**.
- This **increased** productivity has yielded **profits** for farmers and raised large amounts of basic crops to **feed the world**.

## CRITICISMS

- Agribusiness often means that land is devoted to raising **one type of crop**, rather than the variety needed for a balanced diet.
- This practice is especially true in poorer countries.