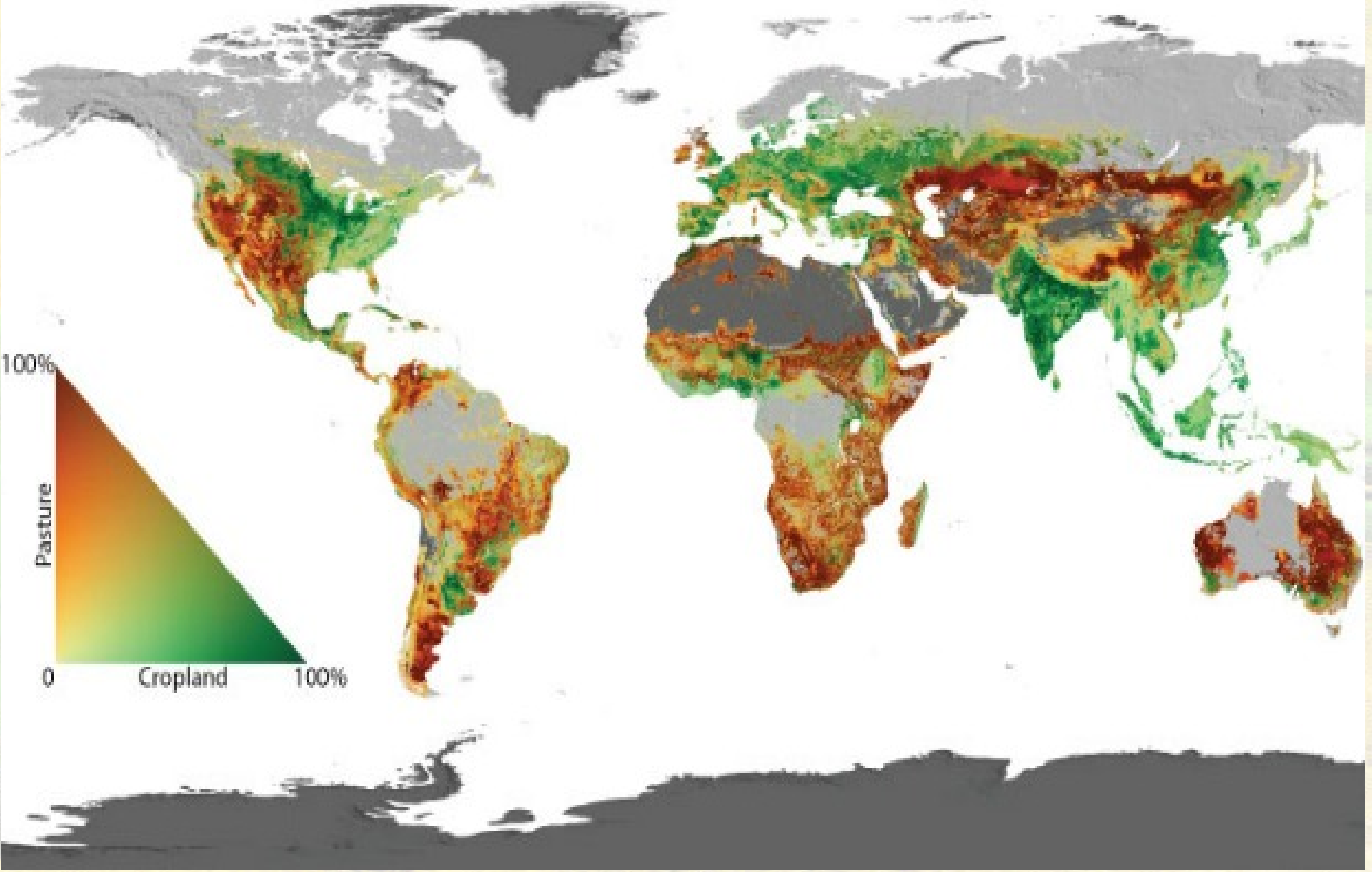
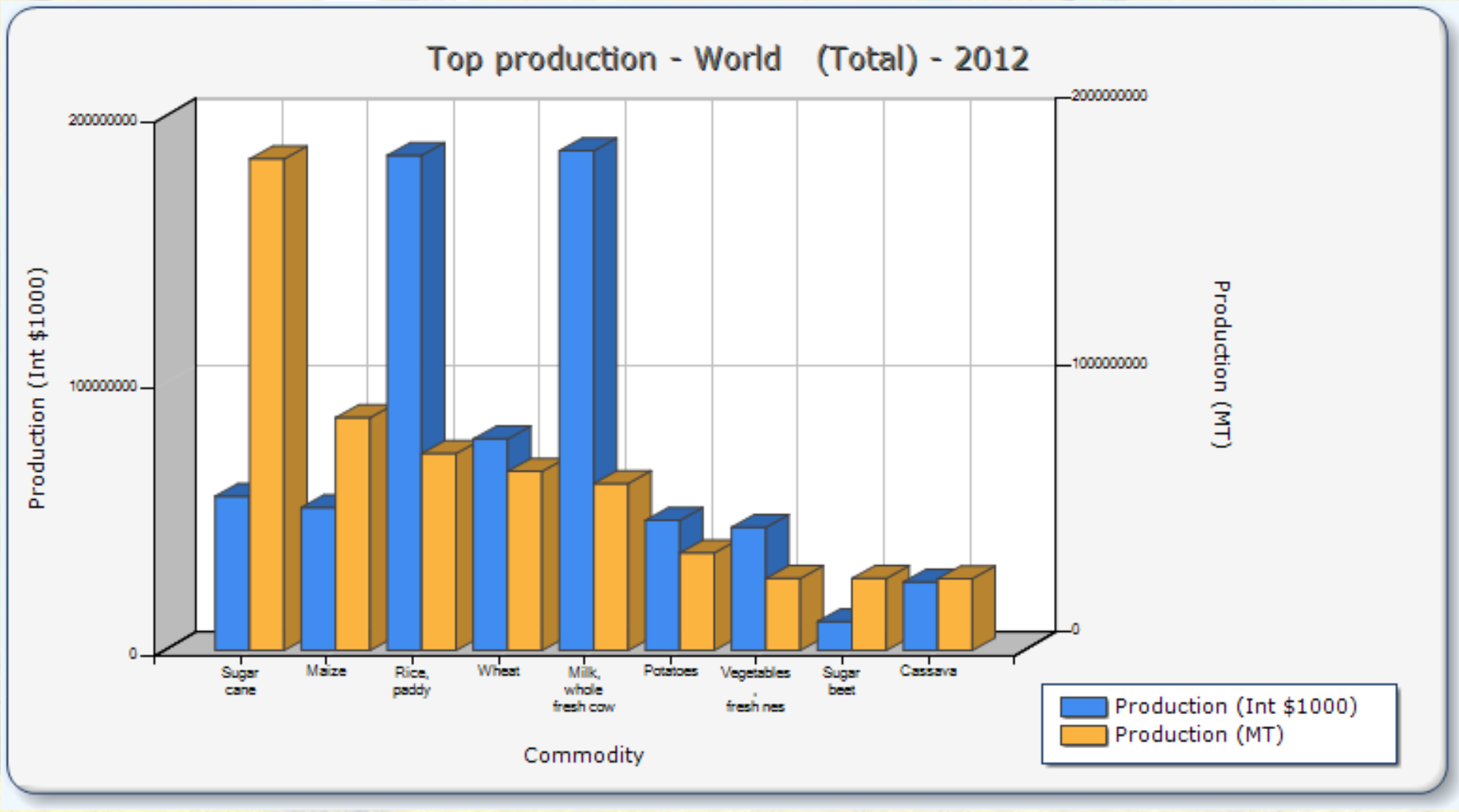
Overview of Food Production

World-Wide
&
United States

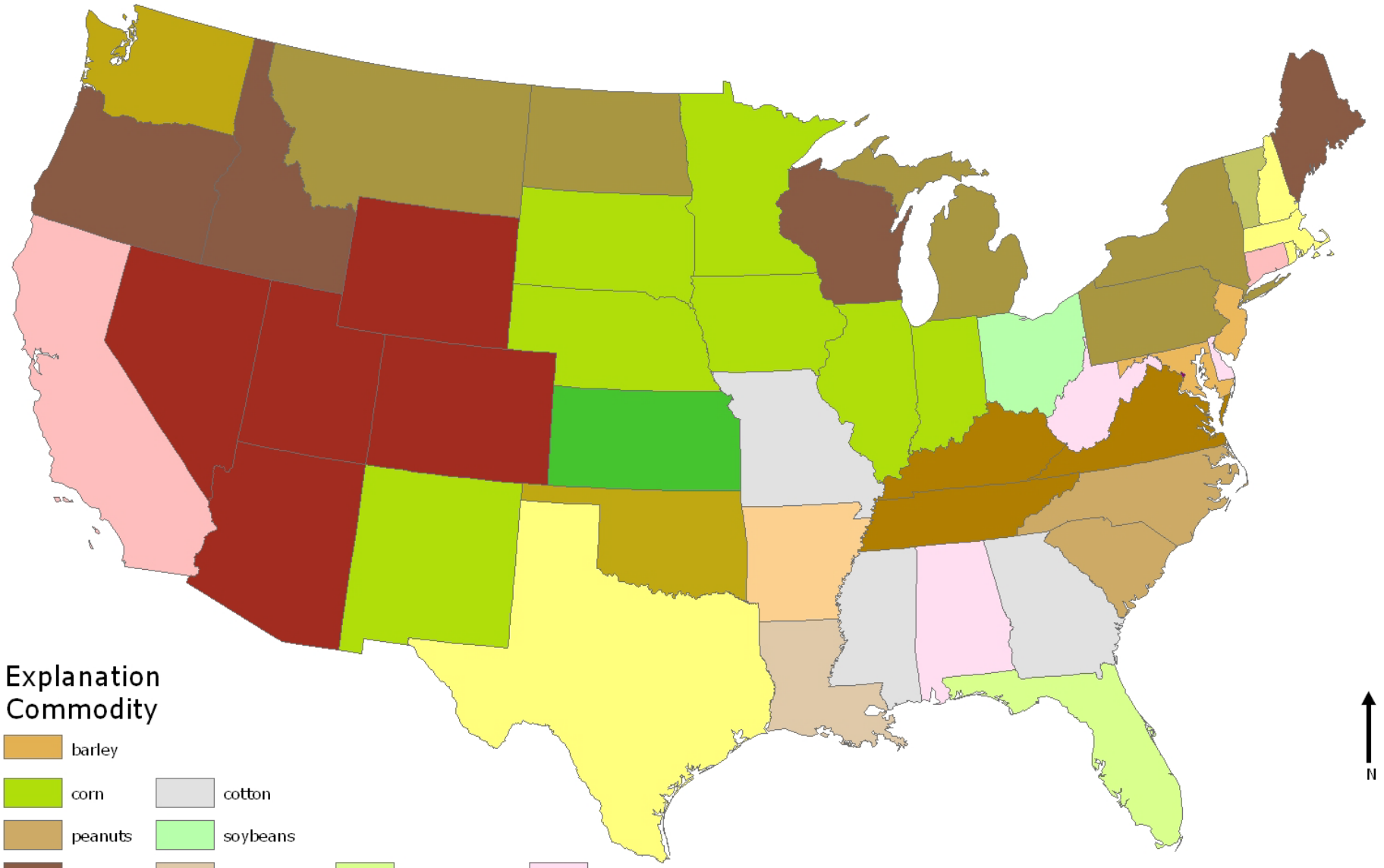
Agricultural Lands of the World



Top 20 Commodities

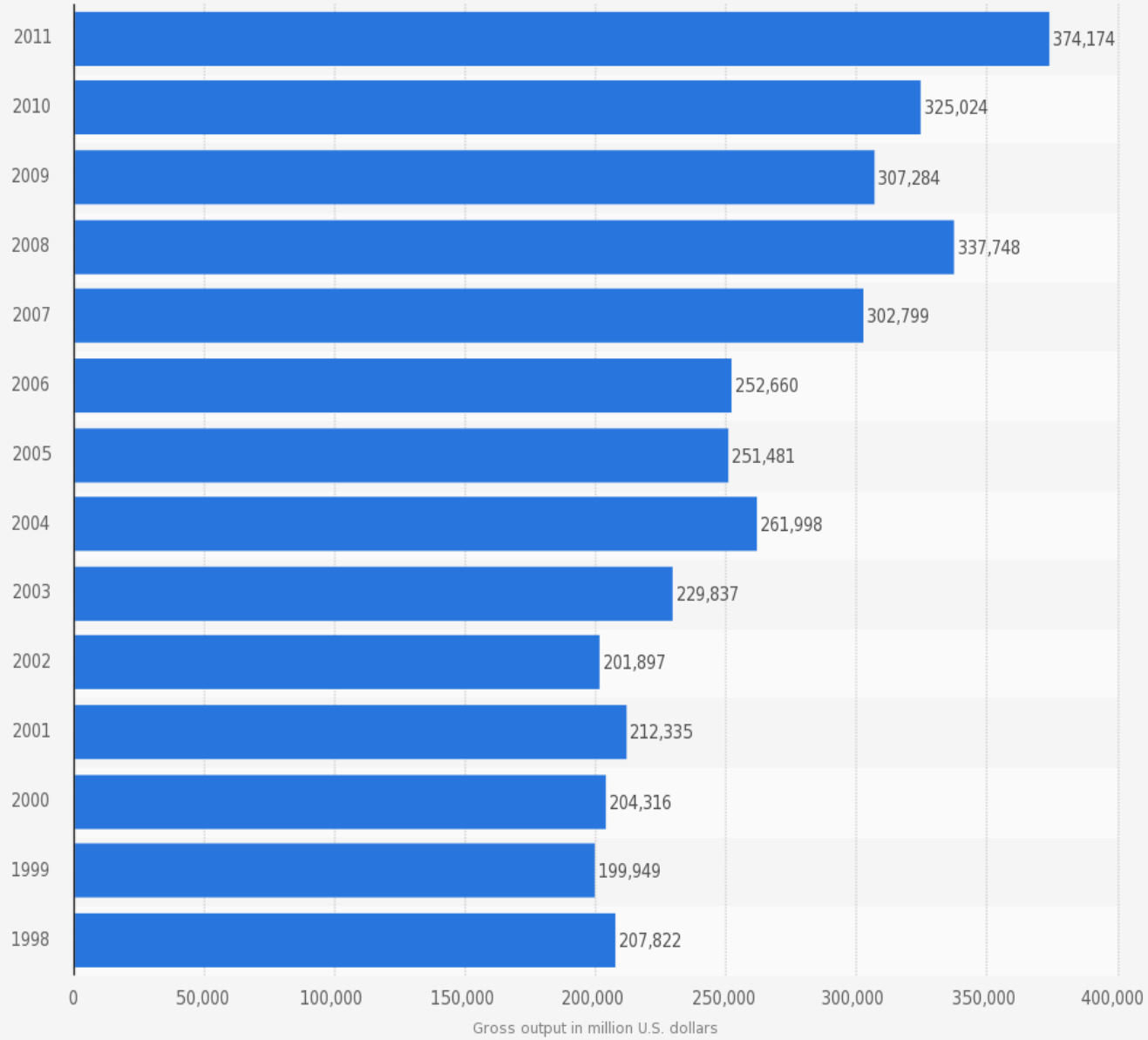


Agricultural Production by State



Cartographer: Chandler Stroup
Source: U.S. Department of Agriculture, 2007
Date: October 20, 2010

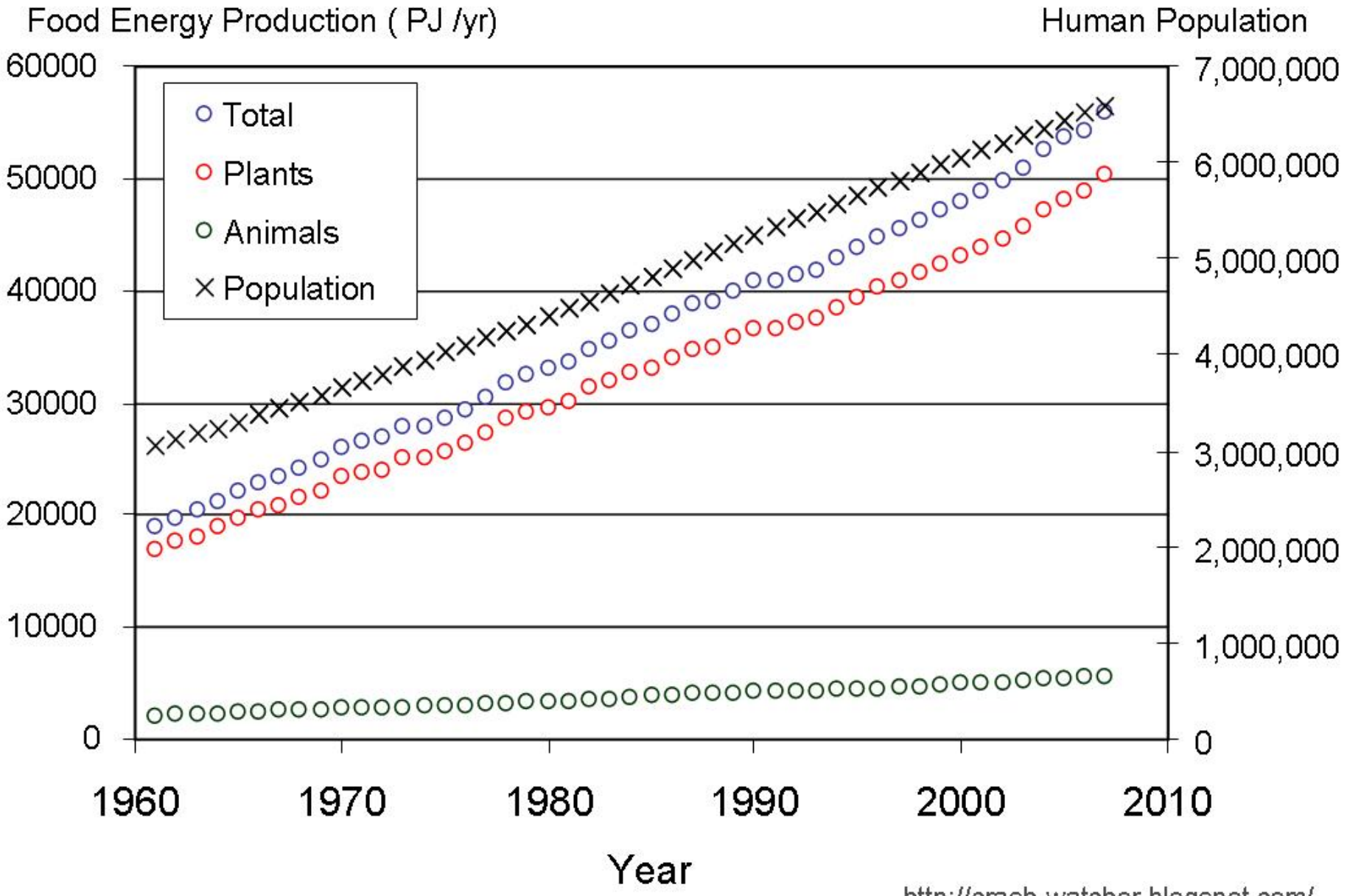
Gross output of U.S. farming from 1998 to 2011 (in million U.S. dollars)



Source::
BEA

Additional Information:
United States; 1998 to 2011

Figure 1: Global Food Energy Production 1961-2007



http://crash-watcher.blogspot.com/

Figure 4: Major Plant-derived Food Energy Contributors

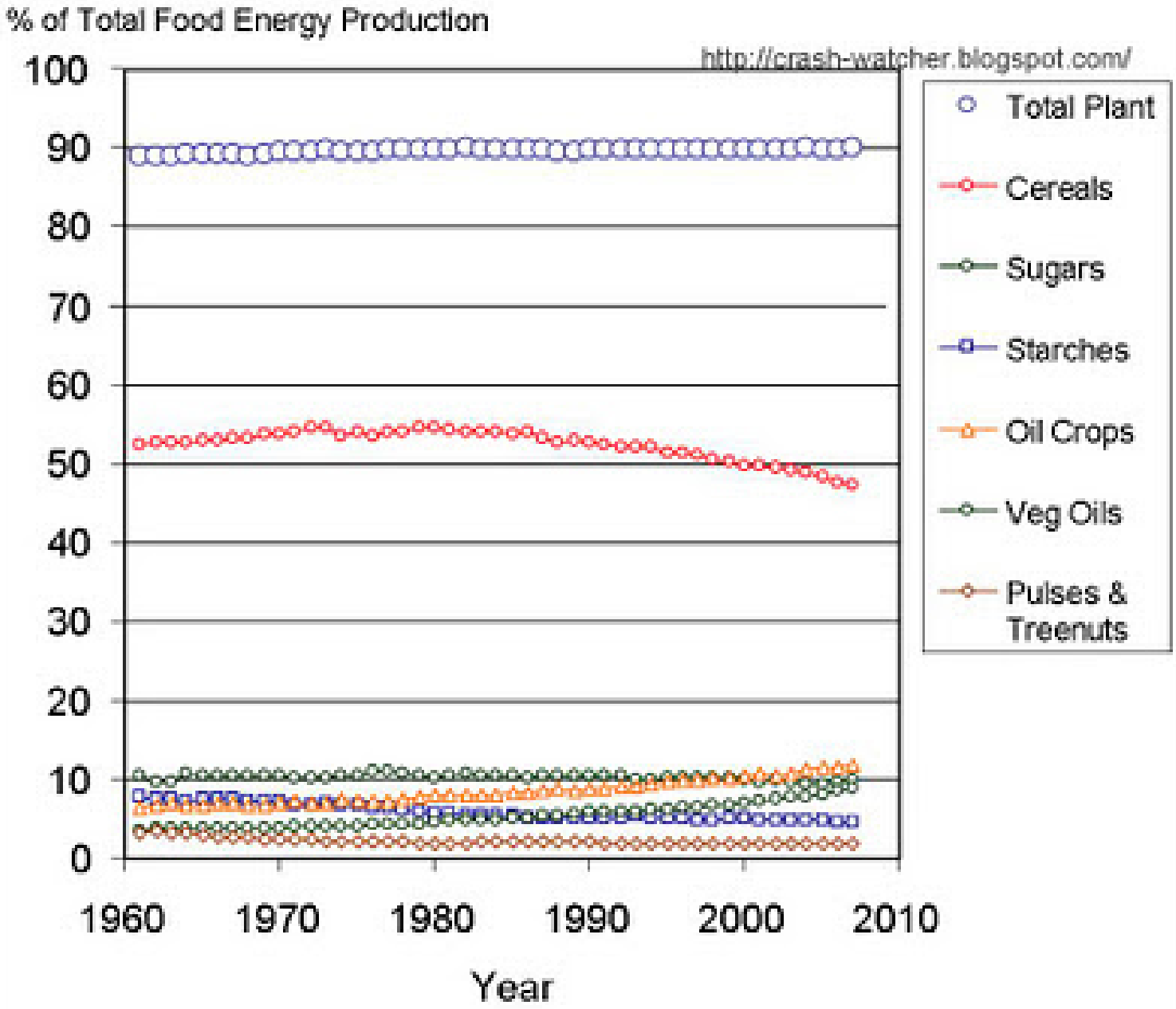


Figure 5: Four Major Plant-derived Food Energy Contributors

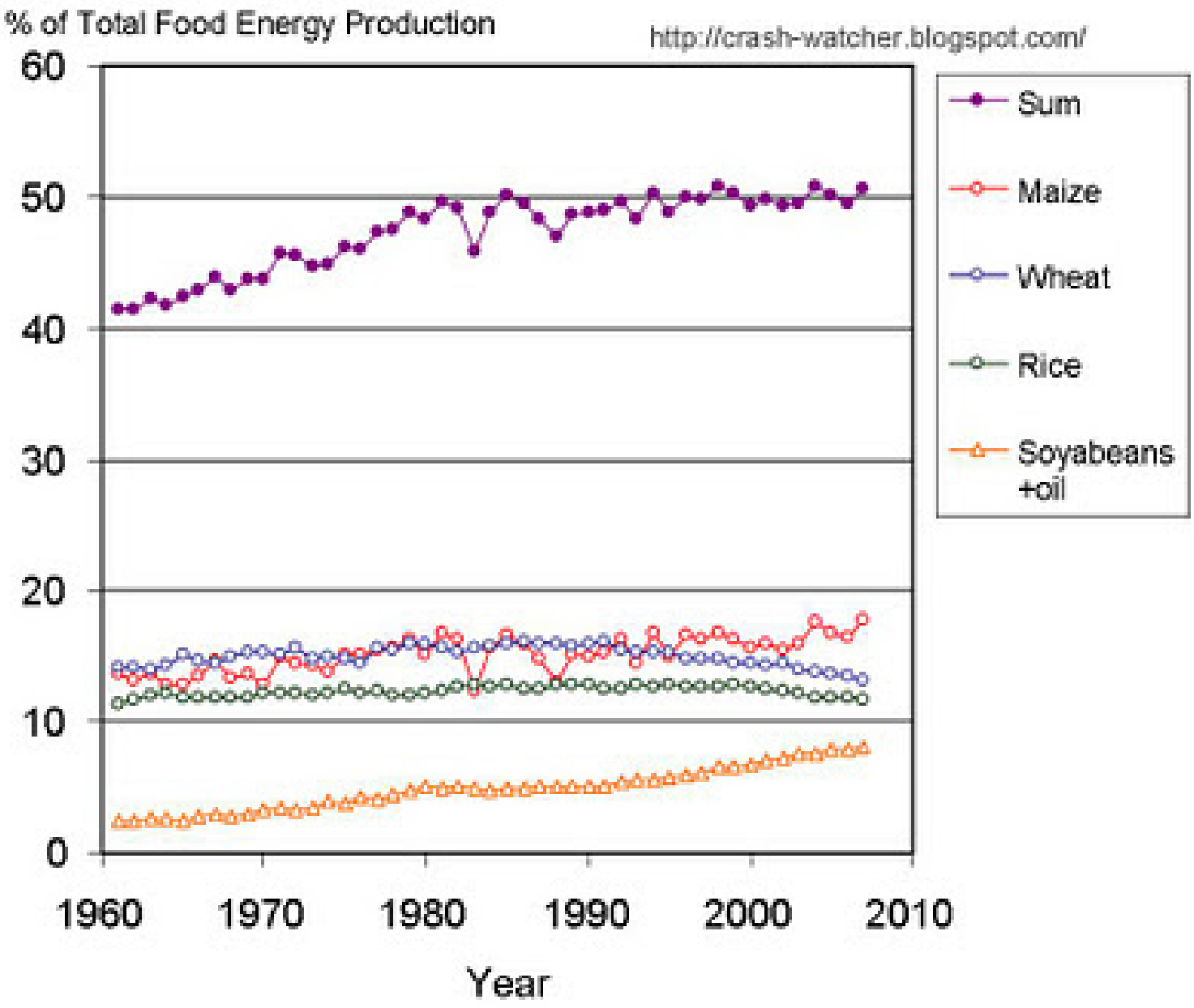


Figure 6: Major Animal-derived Food Energy Contributors

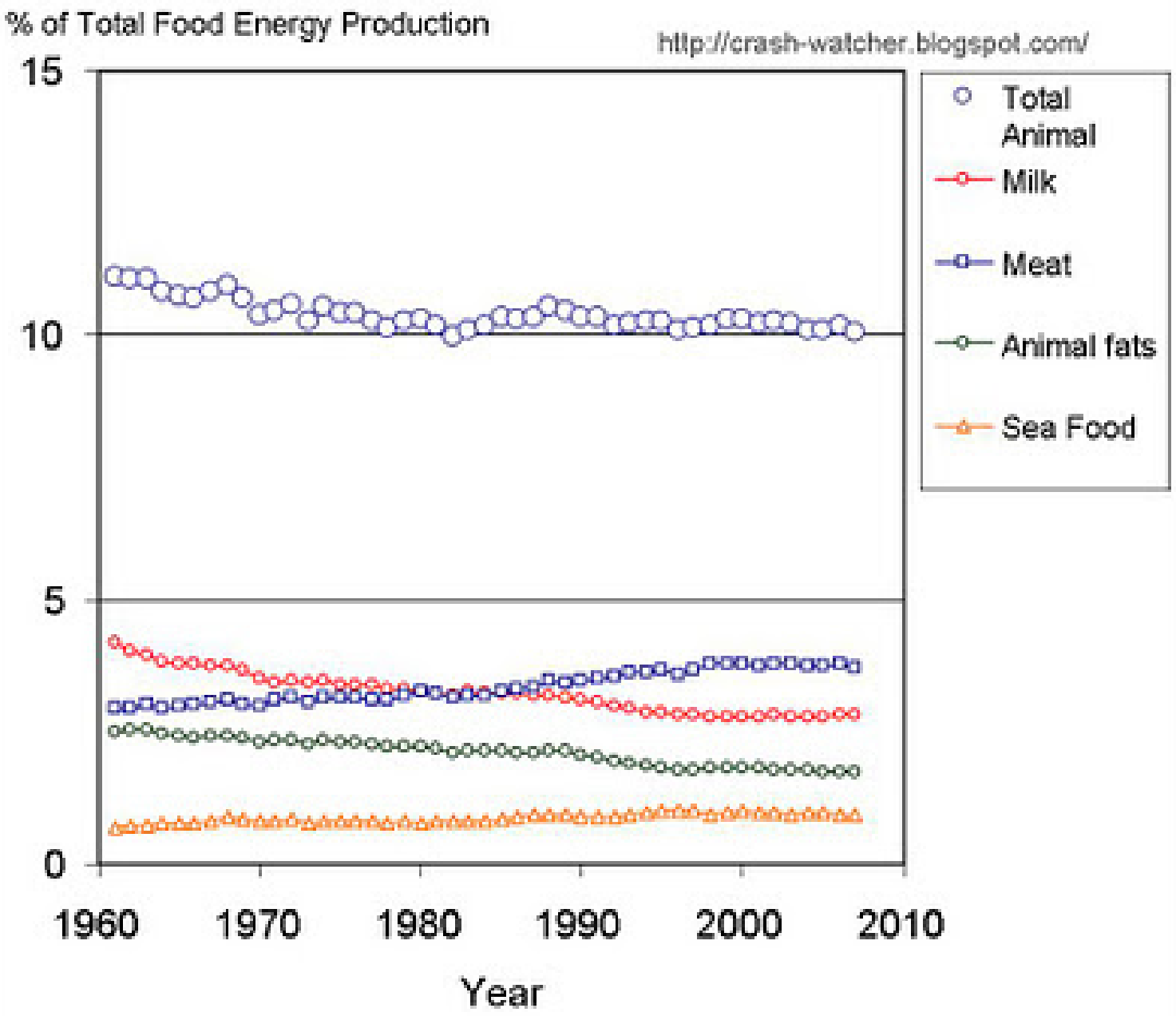
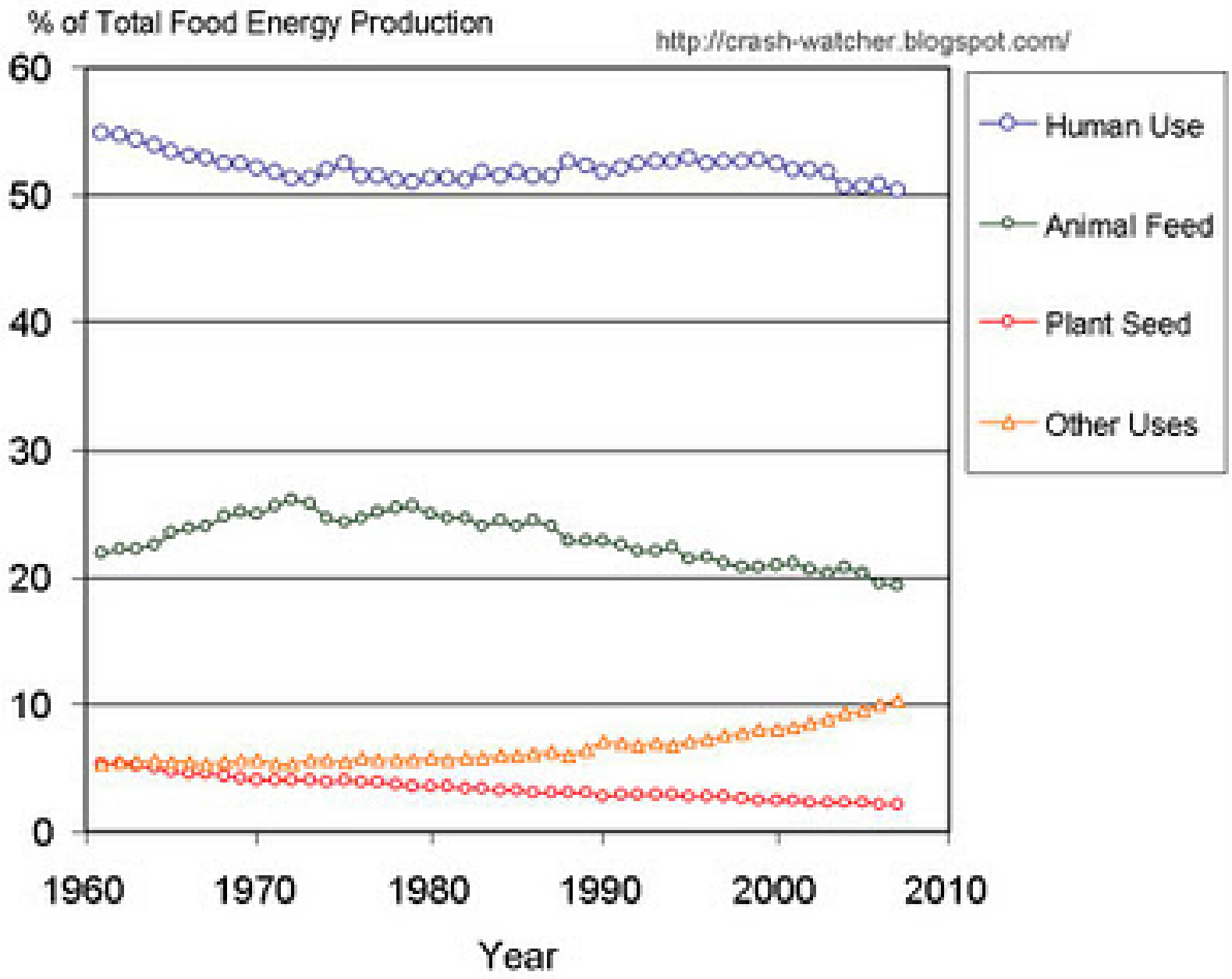


Figure 7: Relative Consumptive Uses of the Global Food Energy Supply



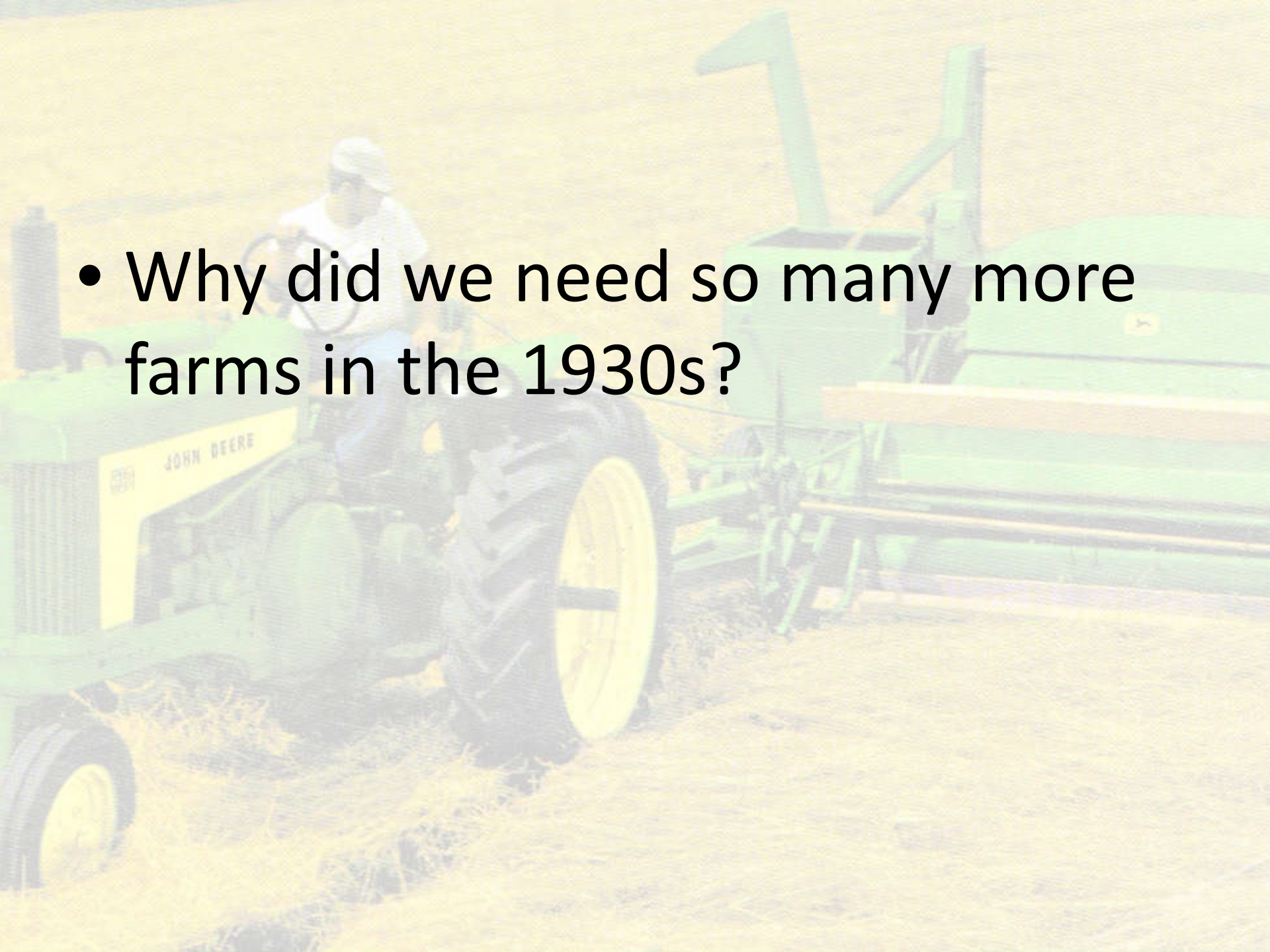
JOHN DEERE

Green Revolution…..

- Research, development and technology transfer
- 1940 - late 1960s, globally in late 1960s
- High-yielding varieties of cereal grains, including maize hybrids
- Irrigation infrastructure, synthetic fertilizers, pesticides
- Modernization of management techniques

Farming

- 1930
  - 5 million farms
  - US Population: 120 million
- 2014
  - 1.9 to 2.0 million farms
  - US Population: 340 million

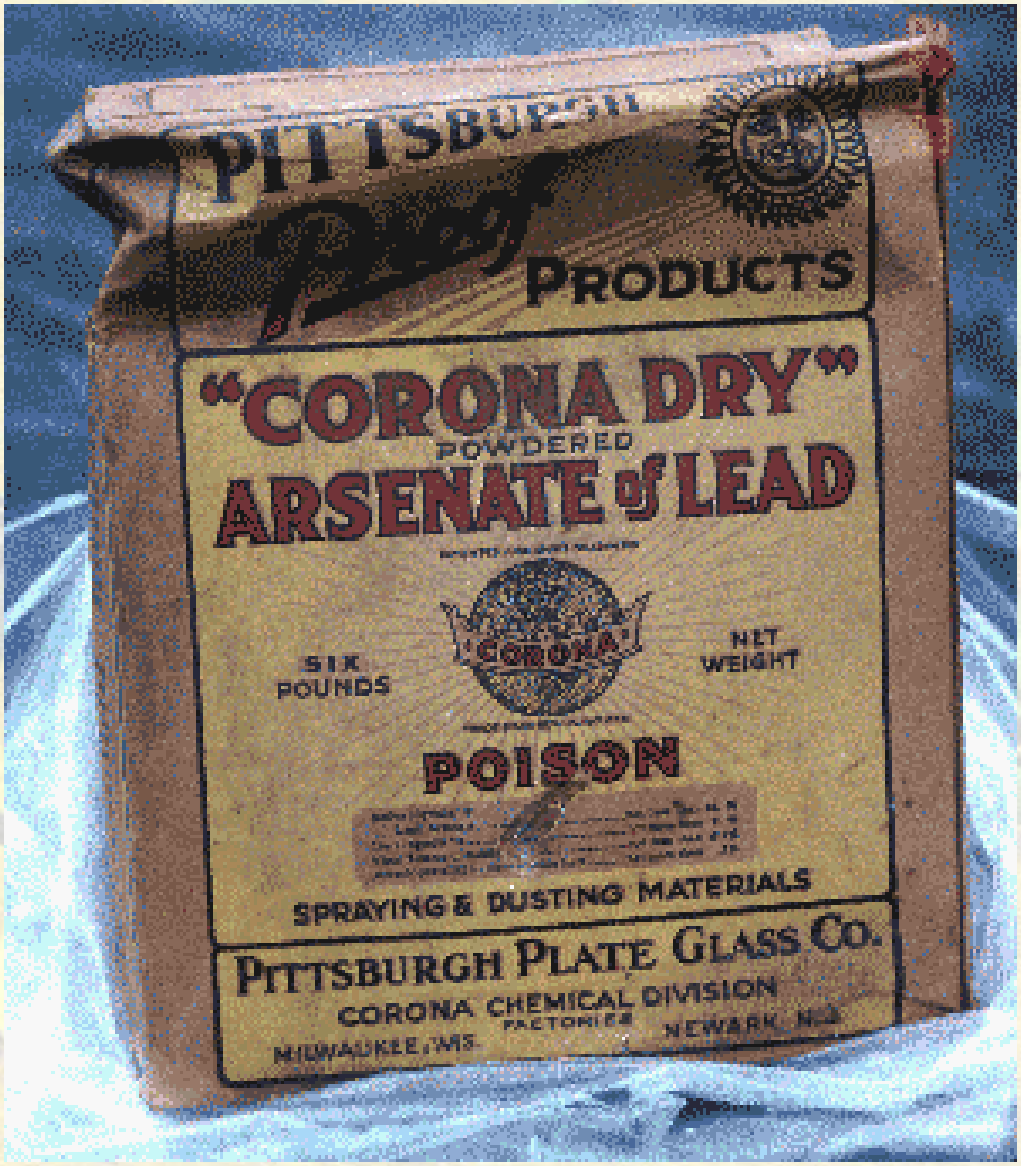


- Why did we need so many more farms in the 1930s?

Mid-Season

What about pest control?

- Non-selective
- Highly persistent
- Hazardous to applicator



Harvest

Productivity

- 1 bale of cotton – 1500 lb
- Men – 250-350 lb per day
- Women – 300-400 lb per day.
- In general, a family of 5 could pick a half a bale per day.

Wages

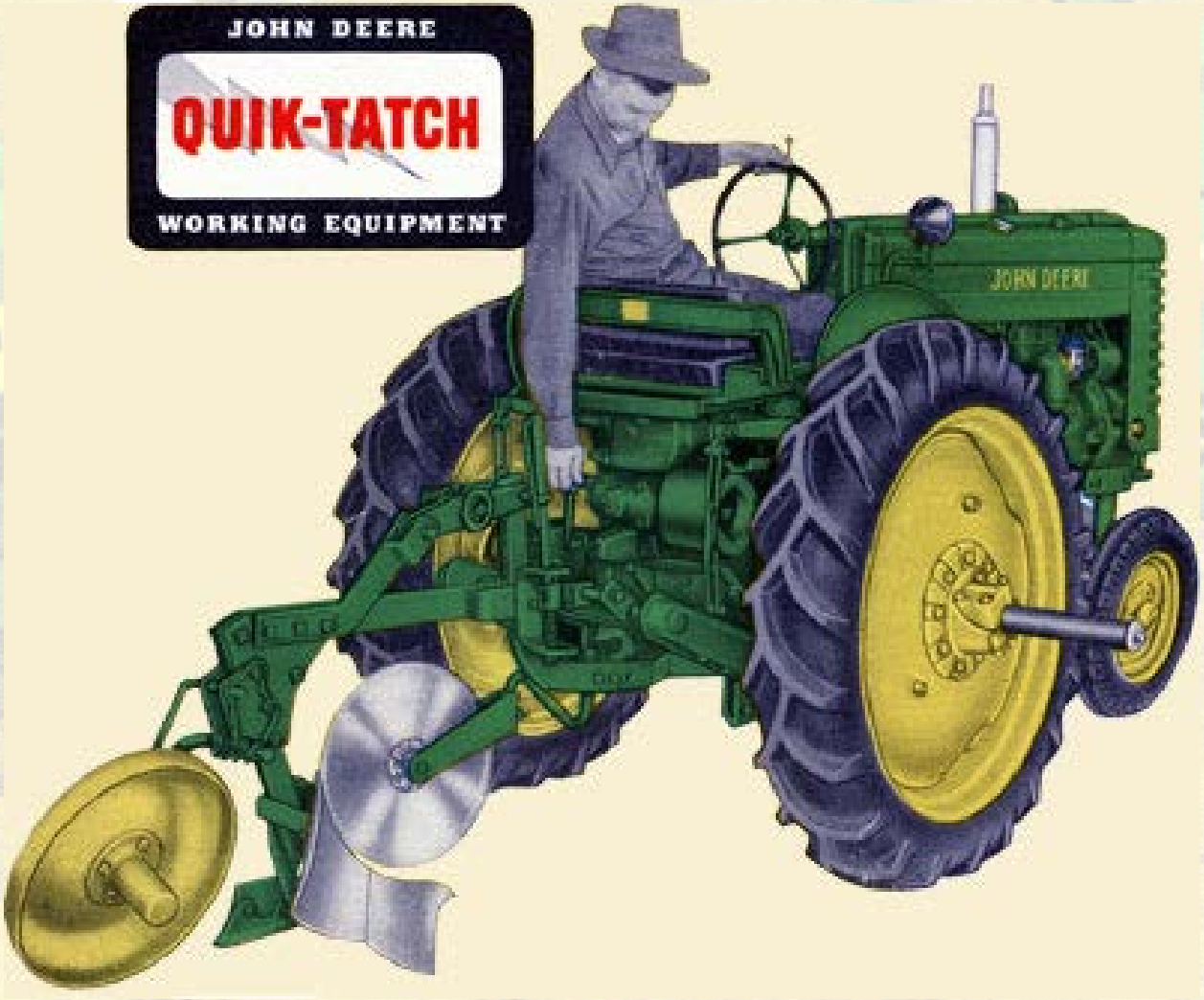
- If working by the hour, some would be paid $0.25

- Adjusting for inflation - $2.34/hr

A New Era

Farmall Cub – 10 HP

John Deere MT – 18 HP



John Deere 620 – 44 HP
3 bottom plow

John Deere 50 – 28 HP


JOHN DEERE
720

Productivity

- Could pick between 0.5 to 1 A per hour.
- Hand picking – 0.5 to 1 A per day.

- Note: no children in this photo


JOHN DEERE

Progress

- In less than 20 years we went from plowing 1 row with horses, to plowing 6 rows with larger equipment.

- This is a massive improvement in efficiency. But what was the cost?

erosion

Progress

- We have sent our children back to school.
- We have improved safety to pesticide applicators.

- But what do we do about the erosion problem?

Strip-tillage

No-Tillage

Where are we today?

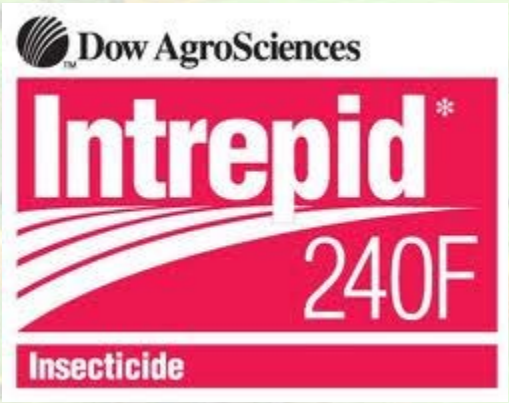
32 row planter

- 5 mph
- 8 rows
- 10.9 acres/hr
- Or 20,000 lb/hr

Pest Control

- Instead of spraying for worms, why not make the plant produce the insecticide.

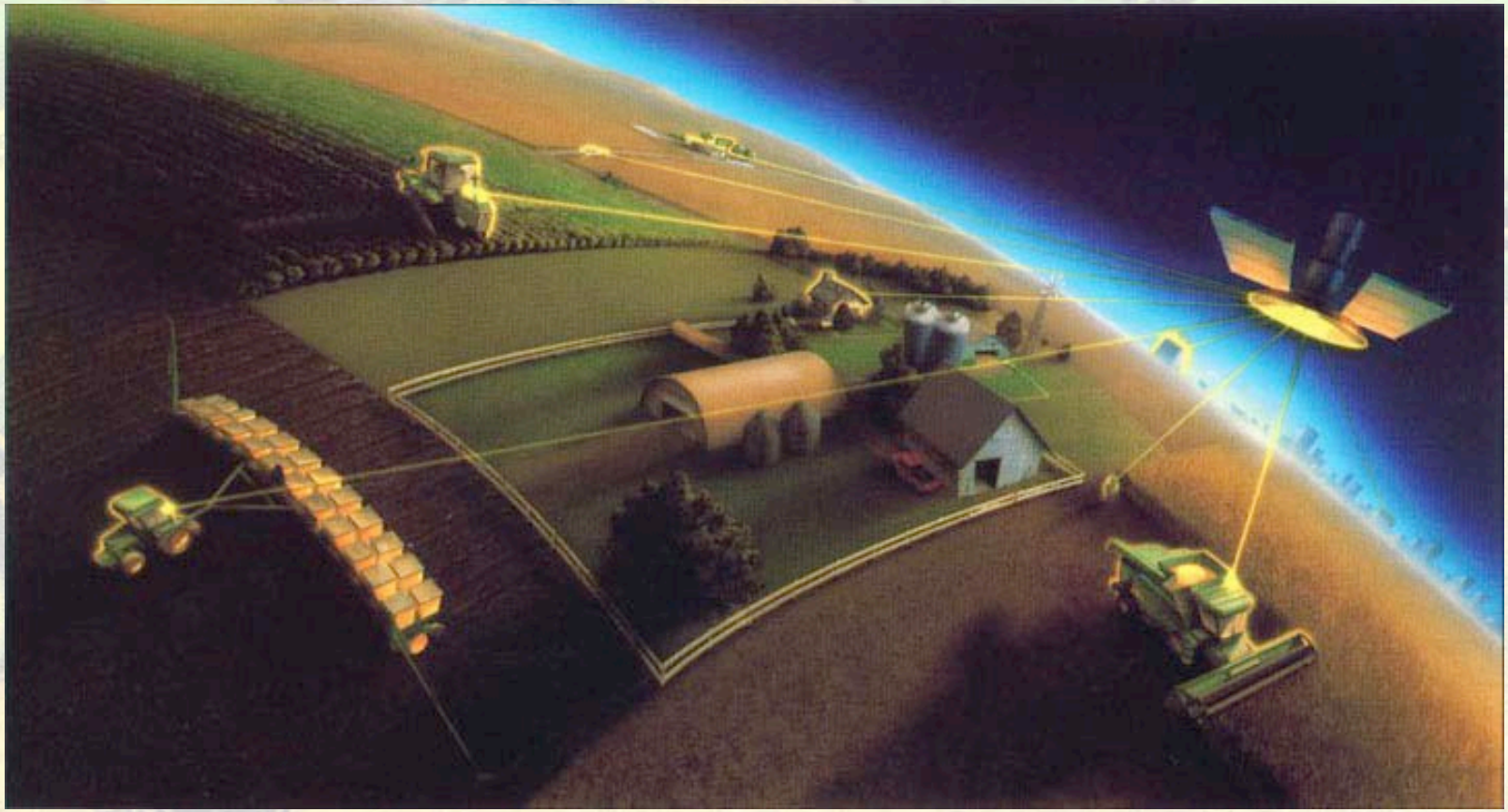
New-Age Insecticides



- Doesn’t kill beneficial insects
- Low risk to applicator
- Little persistence in environment

Guidance

- Uses satellite-based global positioning system (GPS) to accurately locate and track equipment
- Reduces overlap during tillage operations to save time and fuel
- Reduces overlap during fertilizing and spraying applications




900
DANGER


Ag Leader
8.15
00'00"
15.0
20.0
20.0

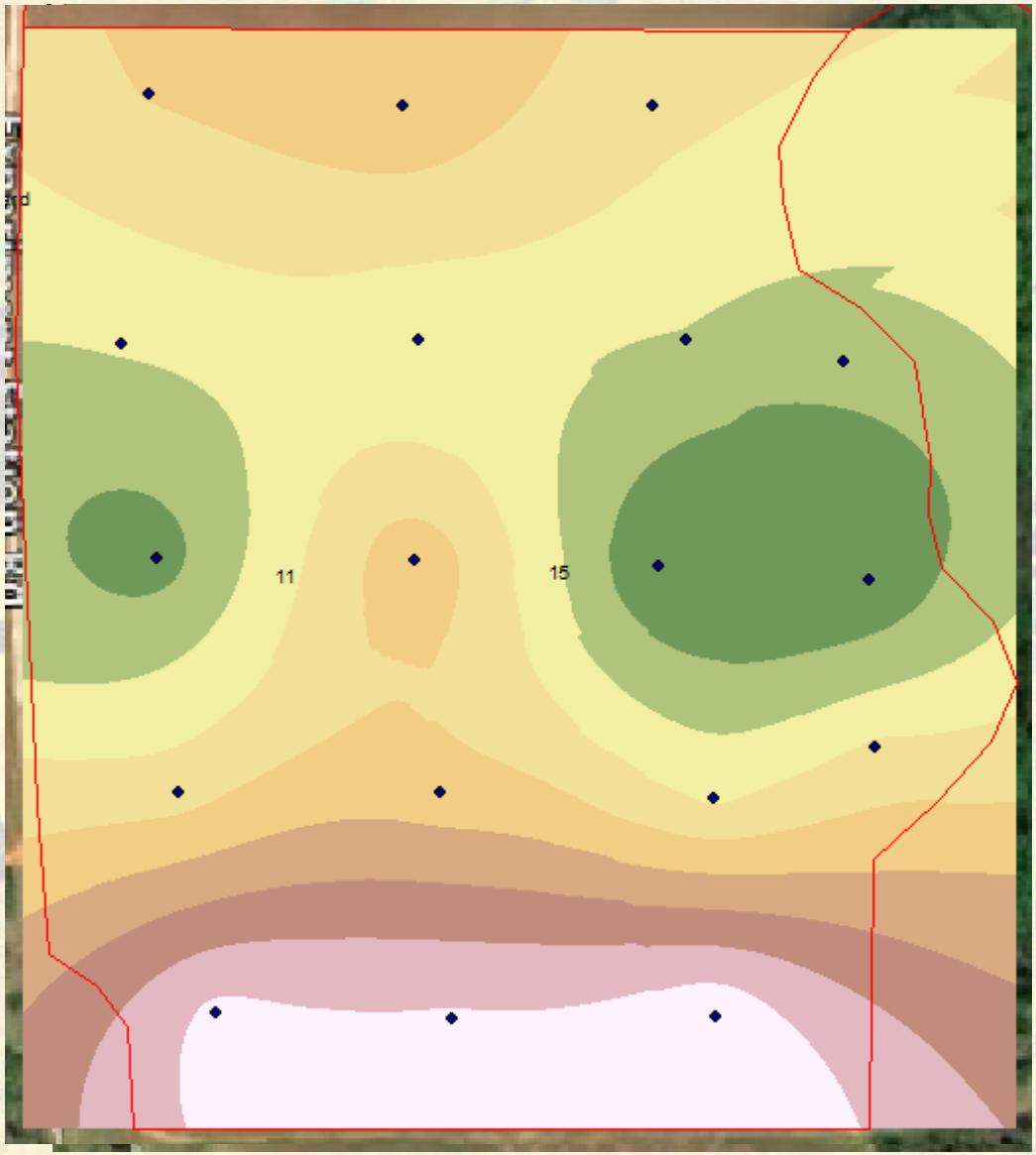

NEW HOLLAND
AGRICULTURE


JOHN DEERE
40
0.0

No row markers

Site Specific Management

- Manage as a single unit
  - P fertilizer = $18.26/ac
- Manage by zone
  - Variable Rate Technology (VRT)
  - P fertilizer = $8.00/ac
- Savings of $10/ac for P fertilizer only
- 25,000 ac of cotton in Santa Rosa Co



Variable Rate Technology

- Adjust seeding rate according to soil texture
- 10-20% reduction in seeding rate without yield reduction

Intelligence runs in the family

Smart choices from the leader in application technology

Next Generation

Drought Tolerance Gene

Next Generation

- Plants that make equal yield with less fertilize.
- Plants with higher nutrition content.
- Improved pest control traits.
- Improved fiber quality.
- Improved storage.
- And on, and on, and on…

pharmaceuticals

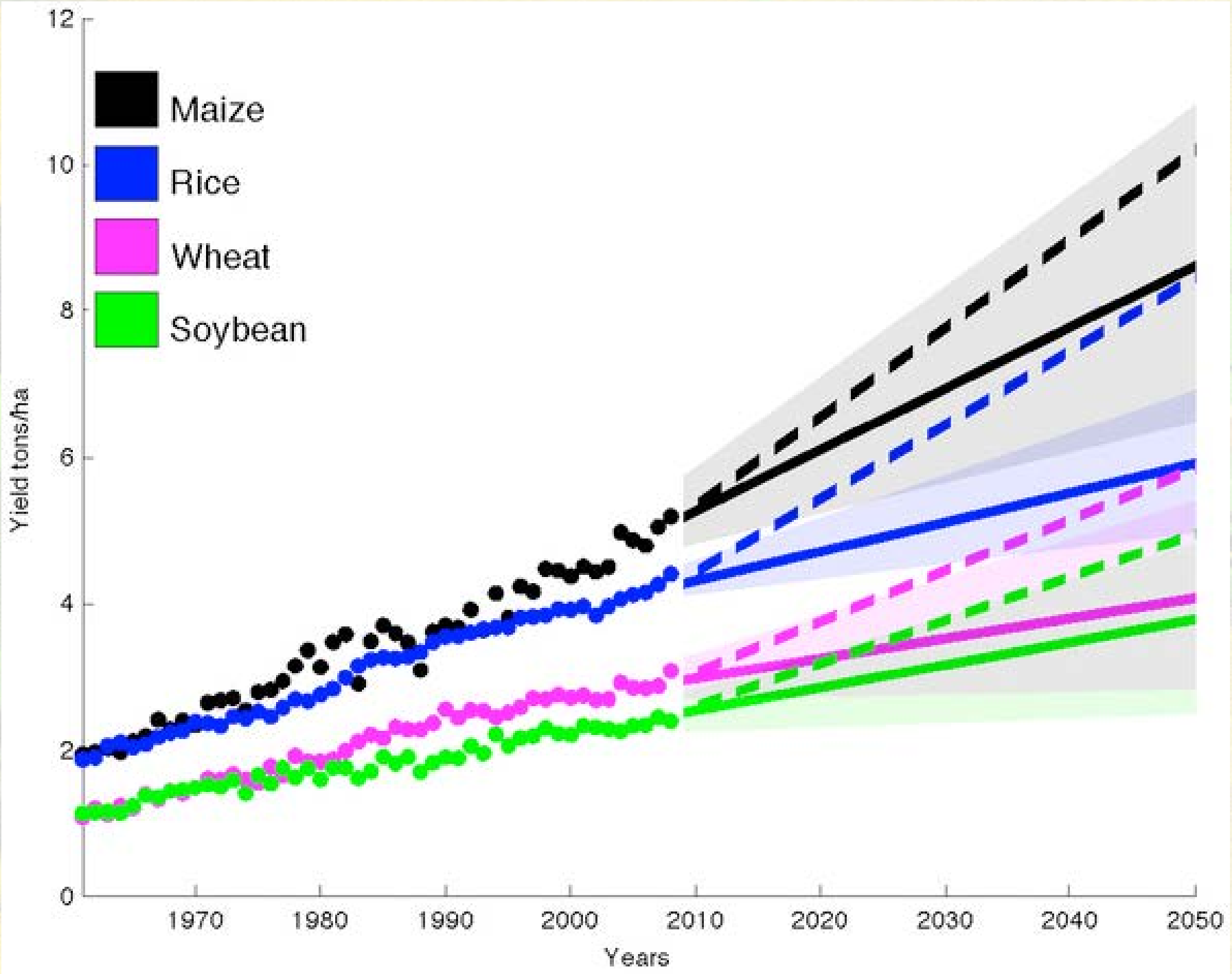
Progress

- We've come a long way, but there is much more to do.

- More than ever we need trained agronomists that have a passion for reliable and responsible crop production.

Commercialized Agriculture

- Characterized by advanced breeding lines and uses of inputs such as fertilizers and pesticides to maintain high productivity
- Goal is not to feed but be economically profitable
- Systems approaches are favored but over-written by economics
- Long-term sustainability – hard to predict


Maize
Rice
Wheat
Soybean
Yield tons/ha
Years
0
2
4
6
8
10
12
1970
1980
1990
2000
2010
2020
2030
2040
2050