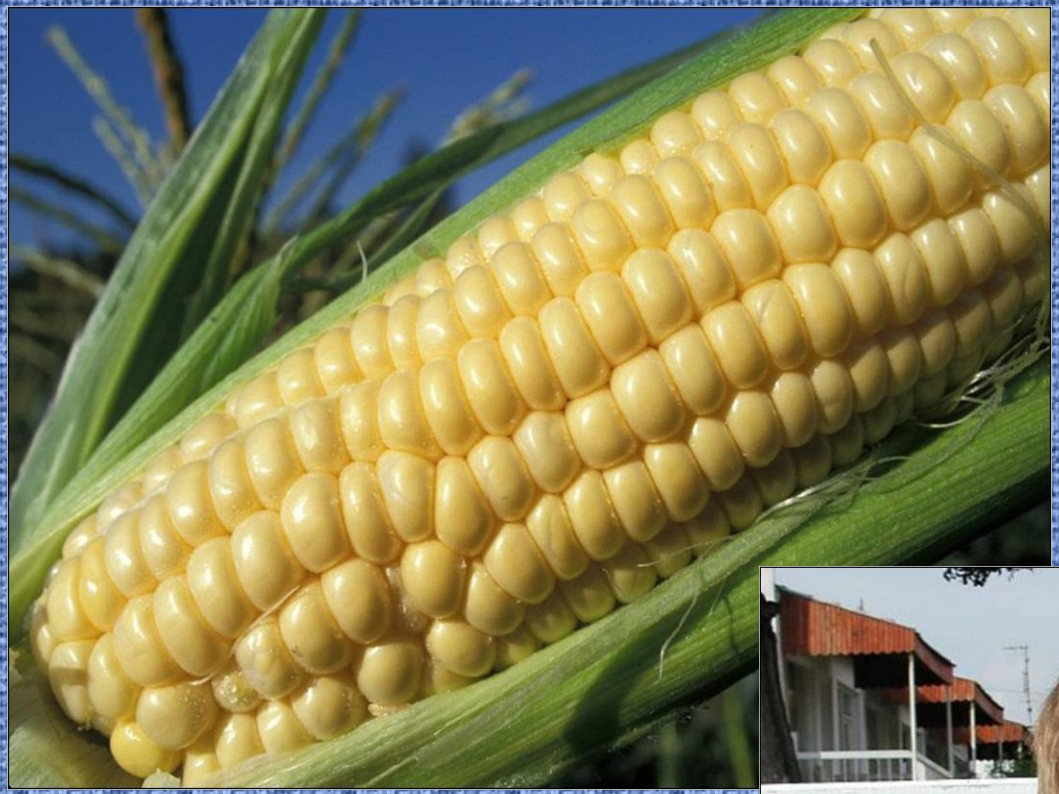
The Shawnee County Conservation District Presents …….

Progress In Conservation

Consider the Case of Corn

Developed by:
Dennis J. Brinkman
Technician
Shawnee County Conservation District

From wheat grain to a loaf of bread ……



From sweet corn
to corn on the cob……

Significant progress in conservation has been made toward sustaining our natural resources (SWAPA+P).

- ✓Soil
- ✓Water
- ✓Air
- ✓Plant
- ✓Animal

+

- ➢People

Let’s discover some of the progress

Soil Erosion

1950's

Land Treatment

- Conventional tillage leaving very little residue after planting.
- No terraces and waterways.
- Erosion estimates, 20 to 40 tons per acre per year.

2000's

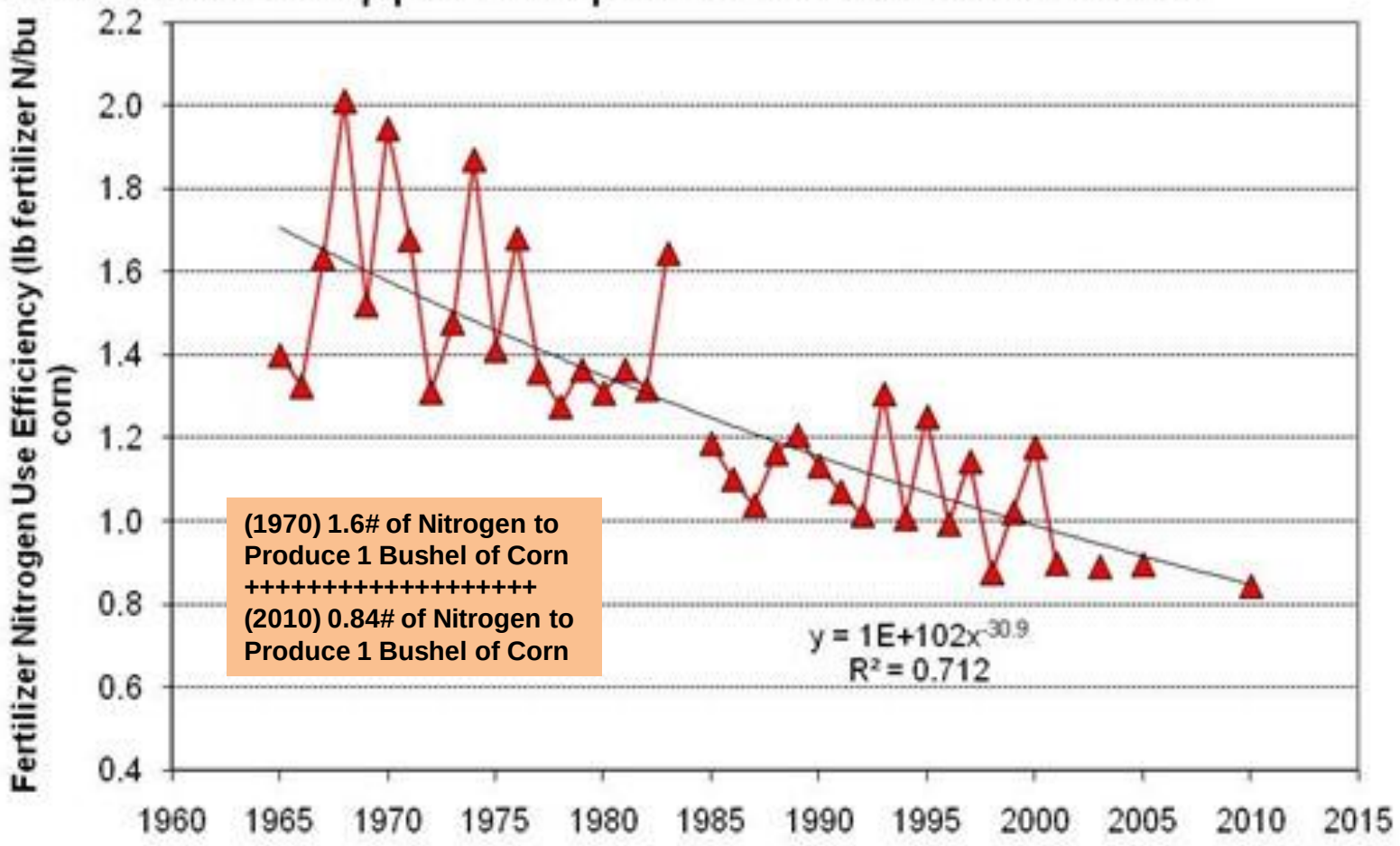
Land Treatment

- No-till planting leaving 50 to 80 percent residue after planting.
- Field with terraces and waterways.
- Erosion estimates, 2 to 4 tons per acre per year.

Source: USDA - Natural Resources Conservation Service, RUSLE2

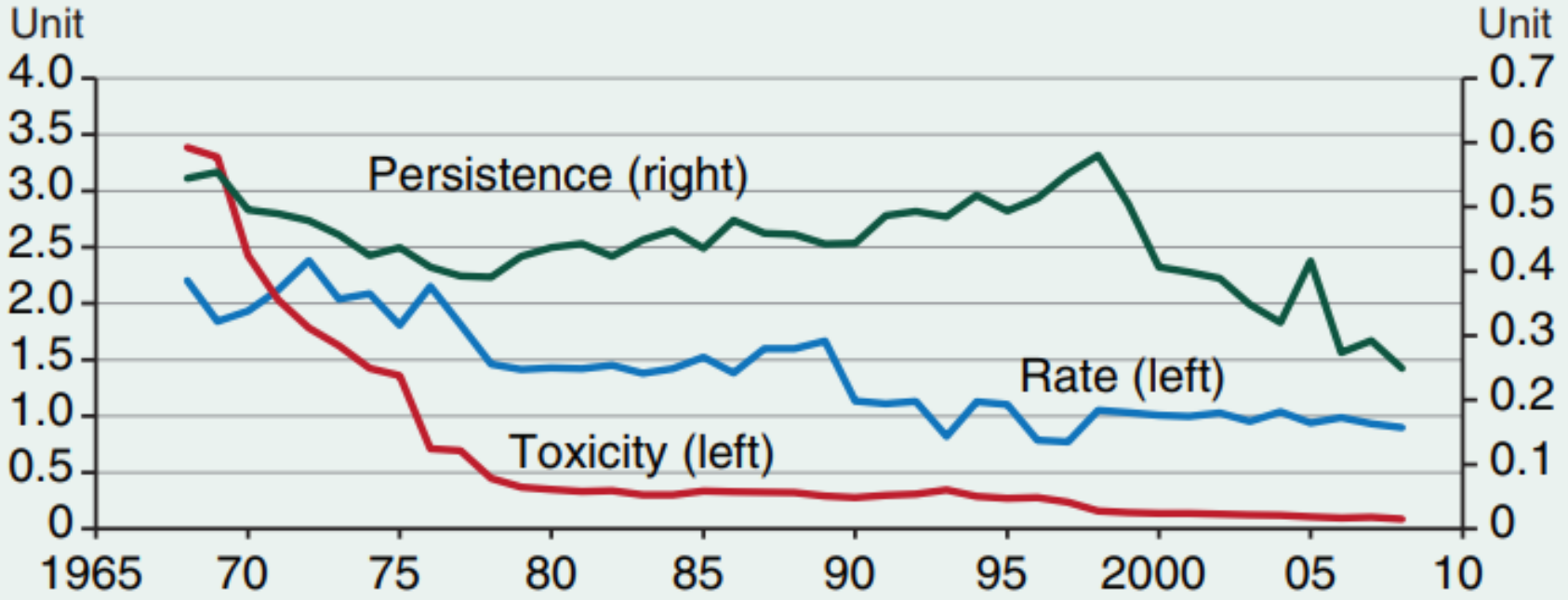
Water

Nitrogen use efficiency, expressed as pounds of N fertilizer applied to produce a bushel of corn



Water

Average quality characteristics of pesticides applied to four major crops, 1968-2008



Rate: Pounds of active ingredient applied per acre in one application times the number of applications per year.

Sources: Estimates based on USDA and proprietary data (Appendix 2) for four major crops: corn, soybeans, cotton and sorghum.

Fuel Used on One Acre to Raise a Corn Crop

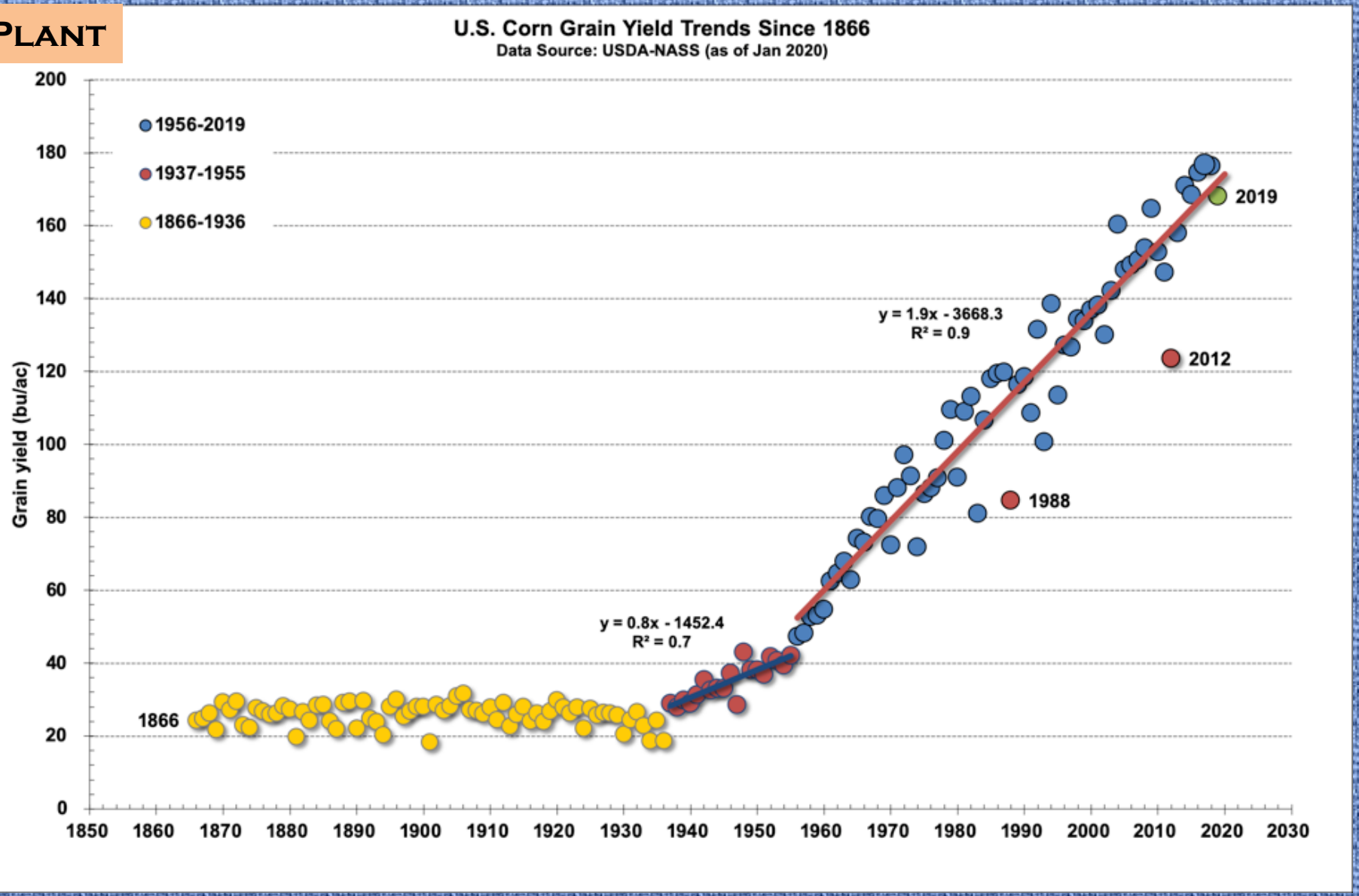
1950's (5.5) Gallons

2000's (2.6) Gallons

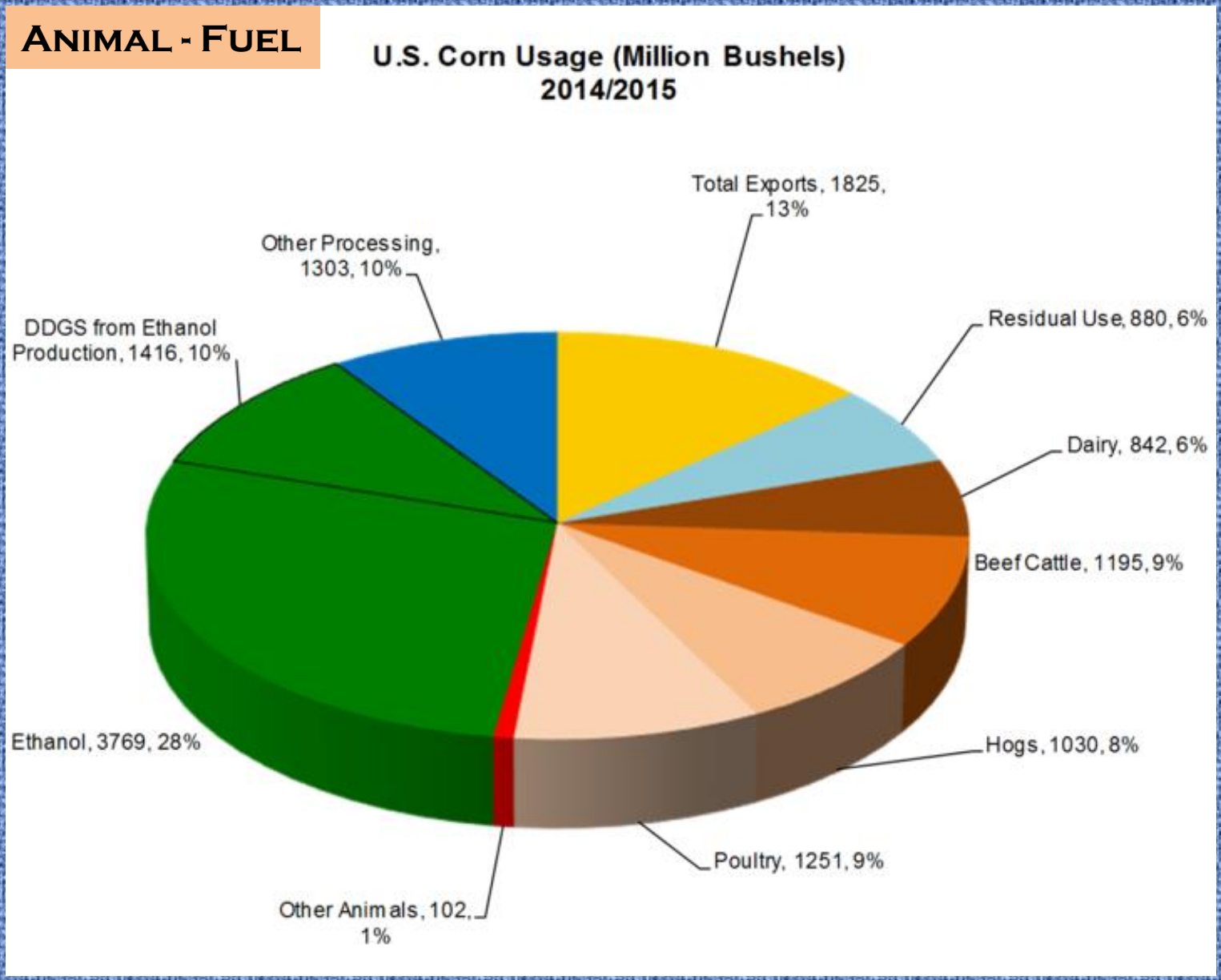
(1950's) - Conventional Tillage System
(2000's) - No-till System

Source: USDA - Natural Resources Conservation Service, RUSLE2

Plant


U.S. Corn Grain Yield Trends Since 1866
Data Source: USDA-NASS (as of Jan 2020)
1956-2019
1937-1955
1866-1936
y = 1.9x - 3668.3
R² = 0.9
y = 0.8x - 1452.4
R² = 0.7
2019
2012
1988
1866
Grain yield (bu/ac)
0
20
40
60
80
100
120
140
160
180
200
1850
1860
1870
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
2030

Animal - Fuel

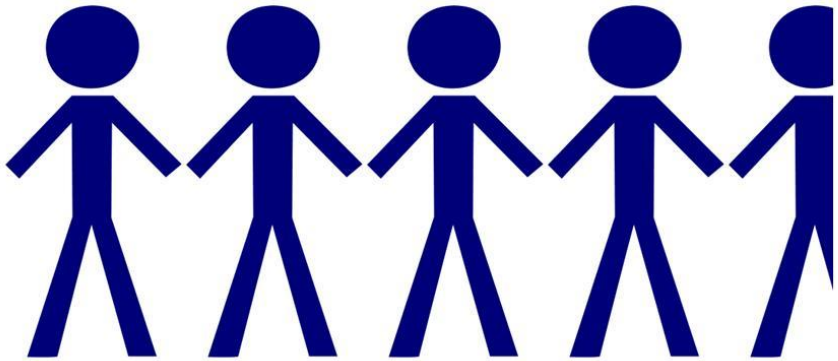

U.S. Corn Usage (Million Bushels)
2014/2015
Total Exports, 1825, 13%
Other Processing, 1303, 10%
DDGS from Ethanol Production, 1416, 10%
Residual Use, 880, 6%
Dairy, 842, 6%
Beef Cattle, 1195, 9%
Ethanol, 3769, 28%
Hogs, 1030, 8%
Poultry, 1251, 9%
Other Animals, 102, 1%

People

One Acre of Corn Serves the Needs of:

1950's (1.1) Persons

2000's (4.7) Persons



(Needs) - Food, fiber, fuel, manufactured products

Source: CIA World Factbook / NationMaster

Exploring the advancements further.

1950's

20 - 40 tons of soil loss per acre to raise 29 bushels of corn

The 29 bushels of corn will yield about 1,450 boxes of corn flakes


2000's
2 - 4 tons of soil loss per acre to raise 128 bushels of corn
The 128 bushels of corn will yield about 6,400 boxes of corn flakes
(2000's) Average Corn Yield

Going from 20 - 40
to 2 – 4 tons of soil

Increased food
production


Shawnee County
Conservation District
Progress In Conservation
Consider the Case of Corn
Soil Erosion
Applied Nitrogen Per Bushel of Corn Produced
Reduced by 36% in 30 Years
Fuel Used on One Acre to Raise a Corn Crop
Applied Herbicide Reduced Over Time
Kansas Corn Yields
One Acre of Corn Serves the Needs of:
Use of Corn Grown in the United States
Resources Conserved

Significant Progress Made

And of course, the increased size of a cob of corn helps too.

Cites and Credits:

Initial idea for display: Wayne D. Lukert, Board Member, Shawnee County Conservation District

Display developed by: Dennis J. Brinkman, Supervisory District Conservationist,
USDA – Natural Resources Conservation Service

Concept for nitrogen and herbicide use, use of corn in the United States: Corn Farmers Coalition

Cites: USDA – Economic Research Service; USDA – National Agricultural Statistics Service;
USDA – Natural Resources Conservation Service; University of Nebraska;
CIA World Factbook; Nation Master

++