

# **Agriculture and the Agricultural Equipment Industry in the USA**

**Analysis of the Presentation by  
Rusty Fowler at Agrievolution**

**John K. Schueller  
Club of Bologna  
15 November 08**



# Agriculture and the Agriculture Equipment Manufacturing Industry in the United States of America

Presented by Russell A. Fowler  
representing the Association of  
Equipment Manufacturers

**Rusty Fowler is President and CEO of Krone  
North America and on Executive Committee  
of Board of Directions of the Association of  
Equipment Manufacturers.**





## DISCUSSION TOPICS

- State of Agriculture in the USA
- Mechanization Evolution and Economic Weight of Industry
- Legislative Framework and Regulations
- Research and Technological Innovation





# STATE OF AGRICULTURE IN THE USA

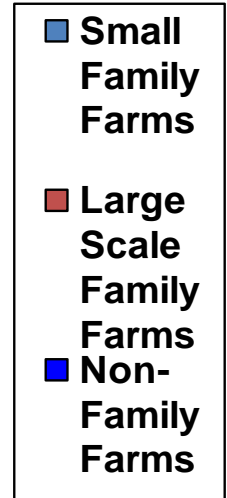
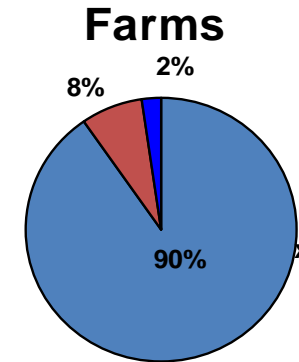




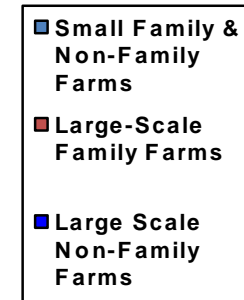
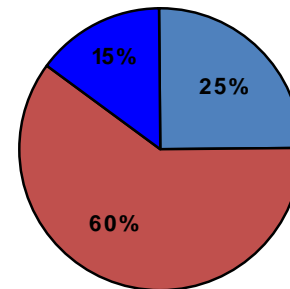
# State of Agriculture in the USA

## U.S. FARMS

- ❑ Operating farms in the U.S.: 2,076,000
- ❑ Net U.S. Farm Income: \$92.3 billion in 2008
- ❑ Total operated hectares: 376,729,956
- ❑ Family Farms: 98%
- ❑ Small family farms (<\$250,000 annual sales): 90%
- ❑ Large scale farms account for only 10% of farms, but 75% of production value
- ❑ Small farms hold 68% of all farm assets
- ❑ Average production area: 182 hectares
  - Small family farms – 70 hectares
  - Large scale farms – 382 hectares
  - Non-family farms – 70 hectares
- ❑ Ownership:
  - Full owner – 61.8%
  - Part owner – 32.1%
  - Tenant – 6.1%



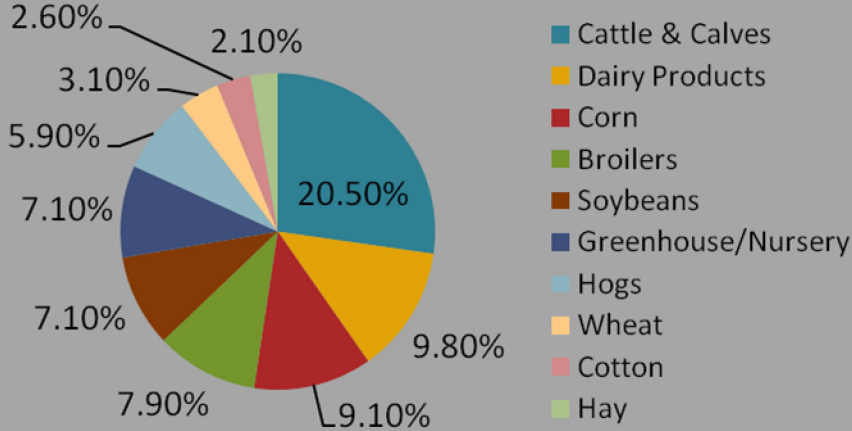
## Value of Production



**Large-scale family farms most important to the equipment industry. Equipment often operated by family member.**



## Value of Receipts of U.S. Products Farmed in 2006



USDA

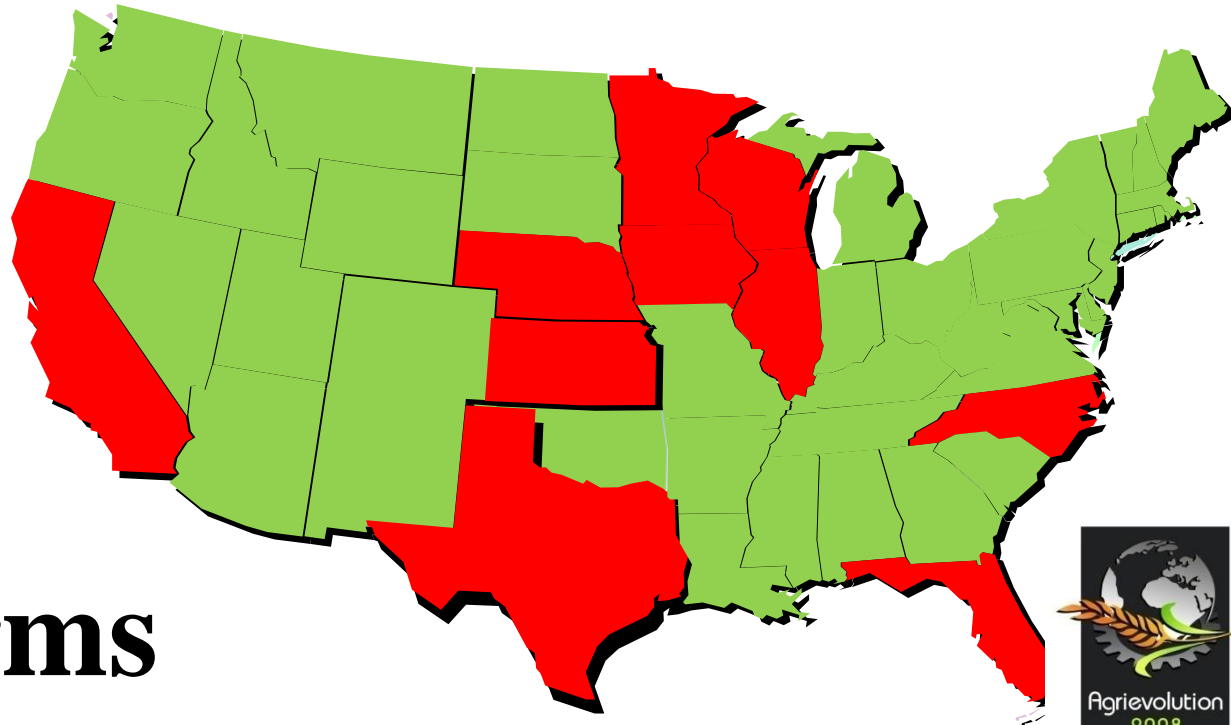
**43% of Receipts  
are Animal**

**Doesn't Include  
F&V, Sugar, etc. !**

# U.S. Farms

### Top 10 Farming States (by Cash Receipts)

<b>California</b>	<b>(Dairy &amp; Nursery)</b>
<b>Texas</b>	<b>(Cattle &amp; cotton)</b>
<b>Iowa</b>	<b>(Corn &amp; hogs)</b>
<b>Nebraska</b>	<b>(Cattle &amp; corn)</b>
<b>Minnesota</b>	<b>(Corn &amp; hogs)</b>
<b>Illinois</b>	<b>(Corn &amp; soybeans)</b>
<b>Kansas</b>	<b>(Cattle &amp; wheat)</b>
<b>North Carolina</b>	<b>(Hogs &amp; broilers)</b>
<b>Wisconsin</b>	<b>(Dairy &amp; cattle)</b>
<b>Florida</b>	<b>(Nursery &amp; oranges)</b>





# State of Agriculture in the USA

## Major Field Crops



### Corn

- 37,9 million hectares planted in 2007
- Up 19% from 2006 and highest since 1946
- Yield 373.2 bushels/hectare
- Decrease to 35 million planted hectares expected in 2008
- Corn prices to average \$4.61/bushel

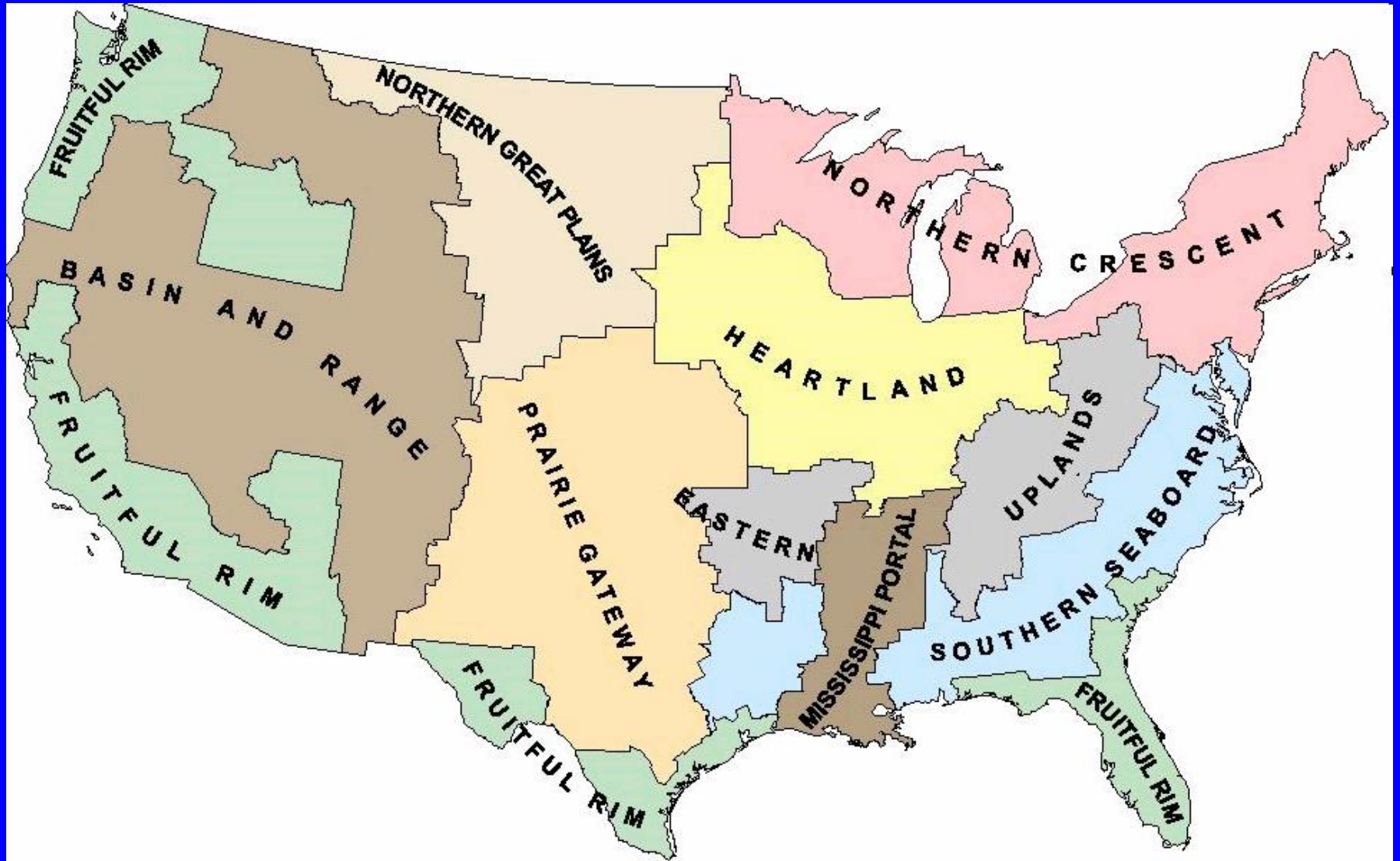
### Soybeans

- 25,7 million hectares planted in 2007
- 16% less than in 2006
- Yield 101.8 bushels/hectare
- Increase to 30.3 million planted hectares expected in 2008
- Average \$13/bushel

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**Because dominate near leading manufacturers, tends to be focus**

# USDA "Resource Regions"



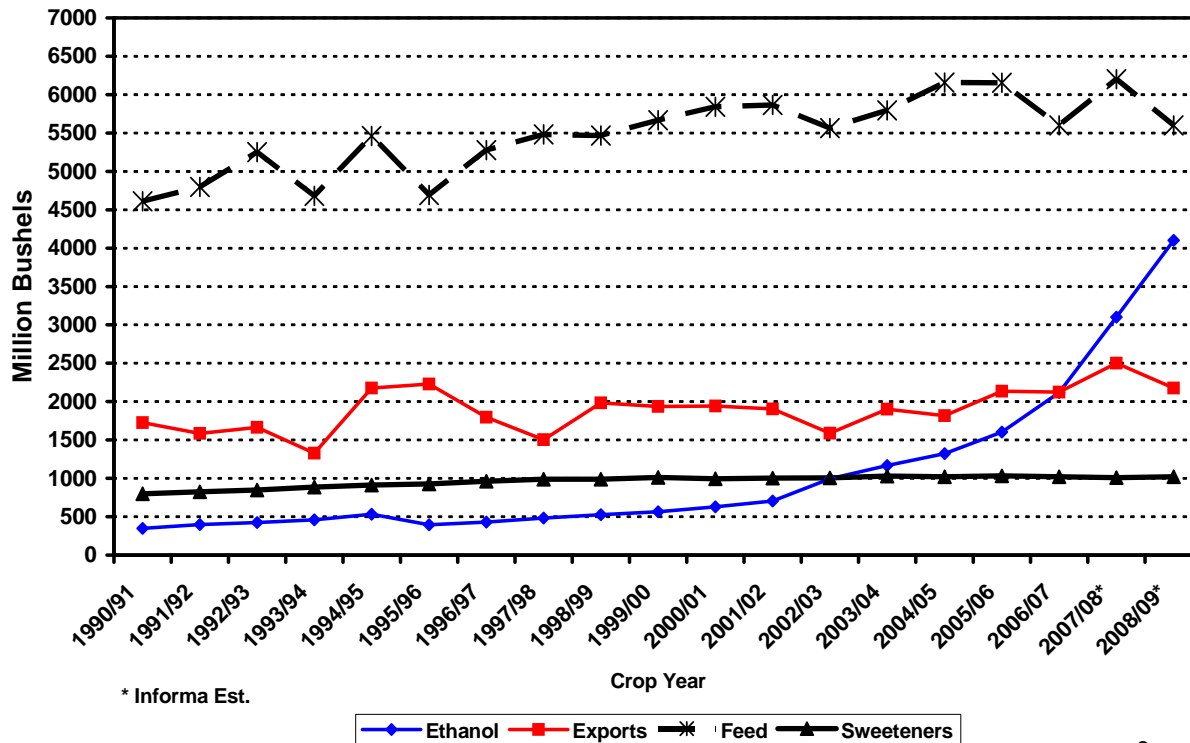
[http://www.ers.usda.gov/Briefing/ARMS/ResourceRegions/ers\\_reg\\_color.htm](http://www.ers.usda.gov/Briefing/ARMS/ResourceRegions/ers_reg_color.htm)





# Continued increased corn use for Ethanol U.S. to produce 11.9 billion gallons in 2008 30% of 2008 corn crop will go to ethanol production

U.S. Corn Usage



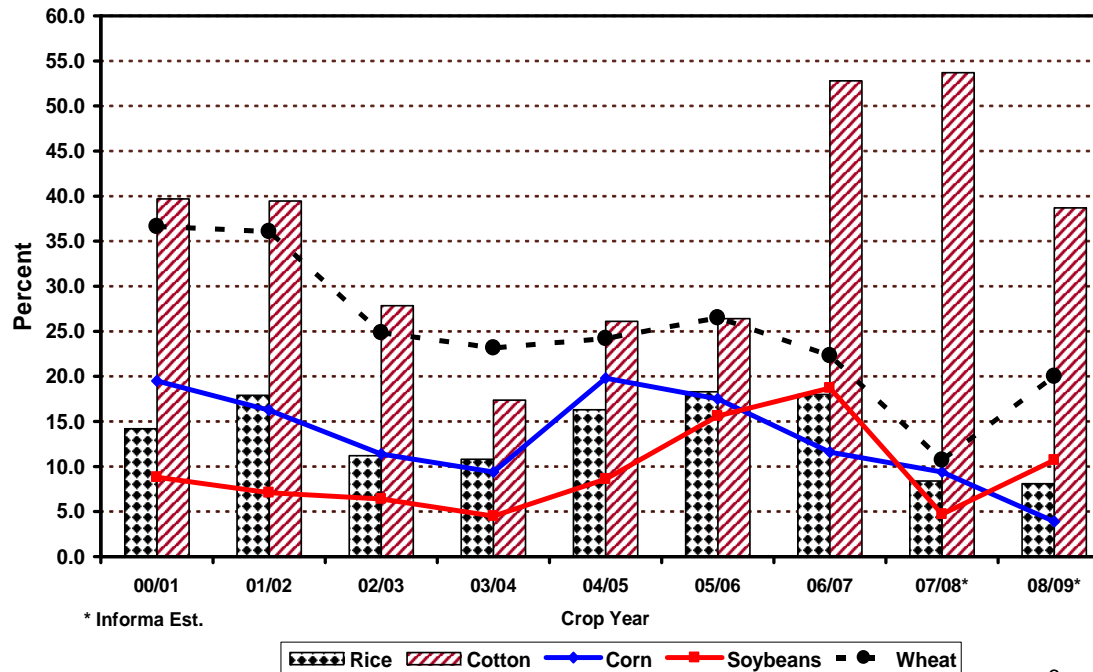
\* Informa Est.



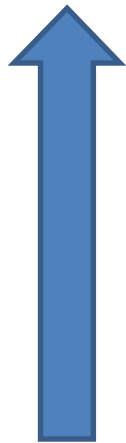


Increased corn, soybean use for biofuels  
Increased global population  
Increased demand for quality food due to global prosperity  
Decreased global yield due to low rainfall in other countries  
Result: Decreased U.S. corn and wheat stocks

U.S. Ending Stocks-to-Use Ratio:  
Corn, Soybeans, Wheat, Rice, Cotton

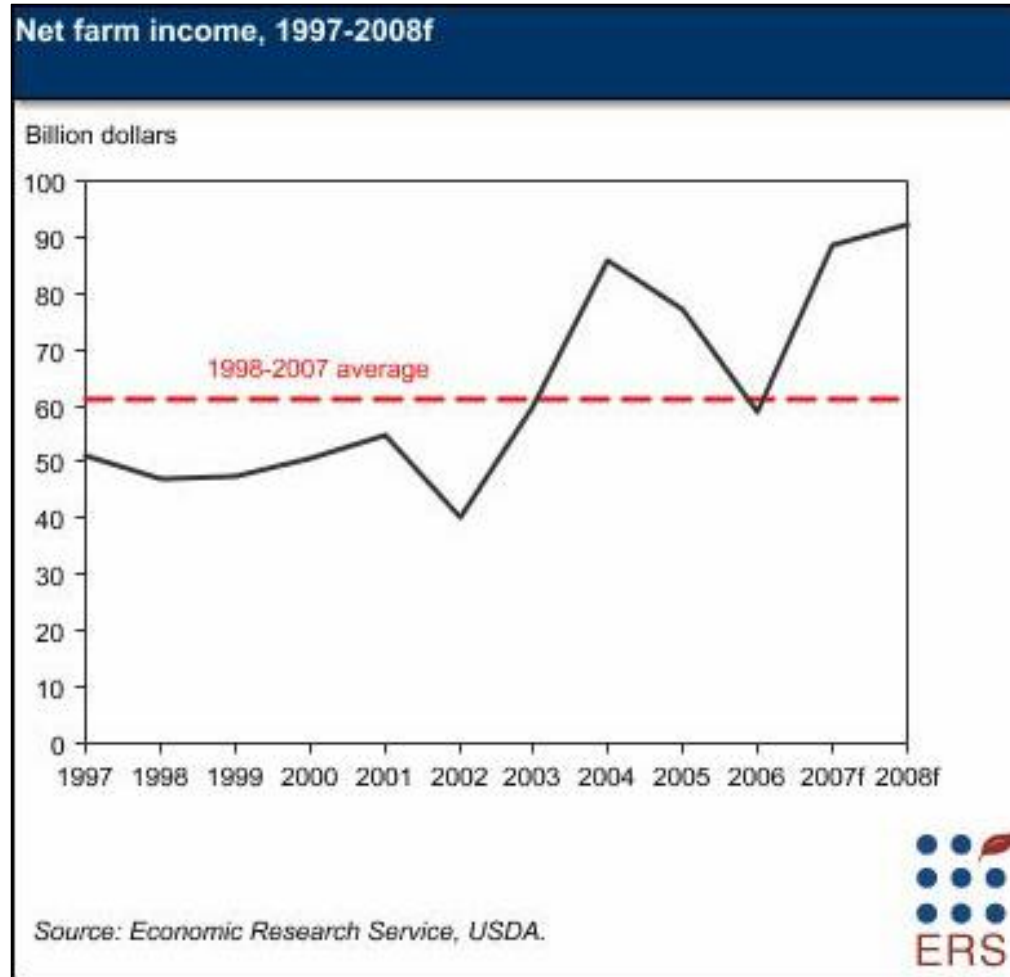


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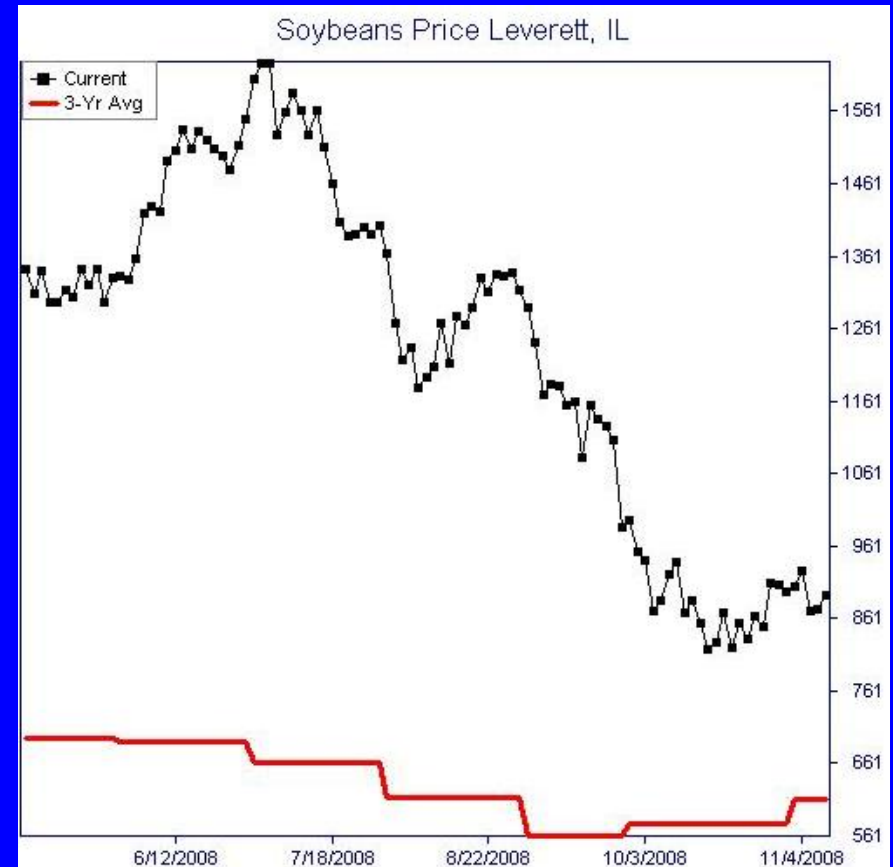
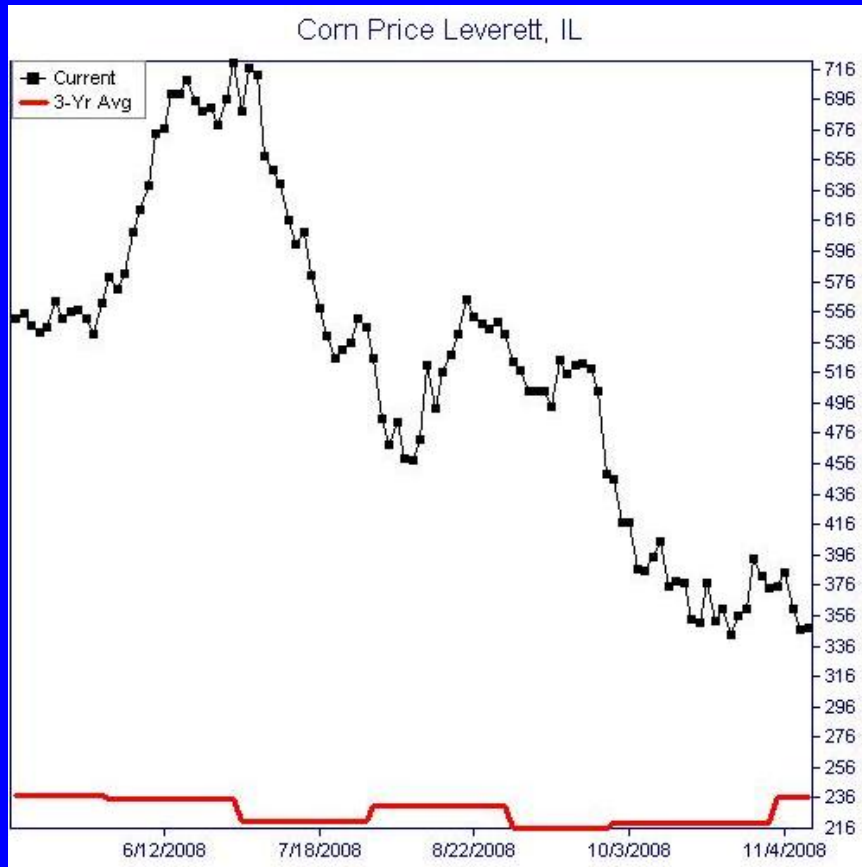


2008

Exports  
Crop Production  
Net Farm Income



# But Prices Have Fallen Since May



[Example: Cash Price (\$/bu) Near Univ. of Illinois]



# MECHANIZATION EVOLUTION AND ECONOMIC WEIGHT OF INDUSTRY





## U.S. Unit Retail Sales

- Trend towards larger, higher horsepower equipment
- Repeating double digit growth of 2007
- Growth again fueled by increase in corn production & energy needs

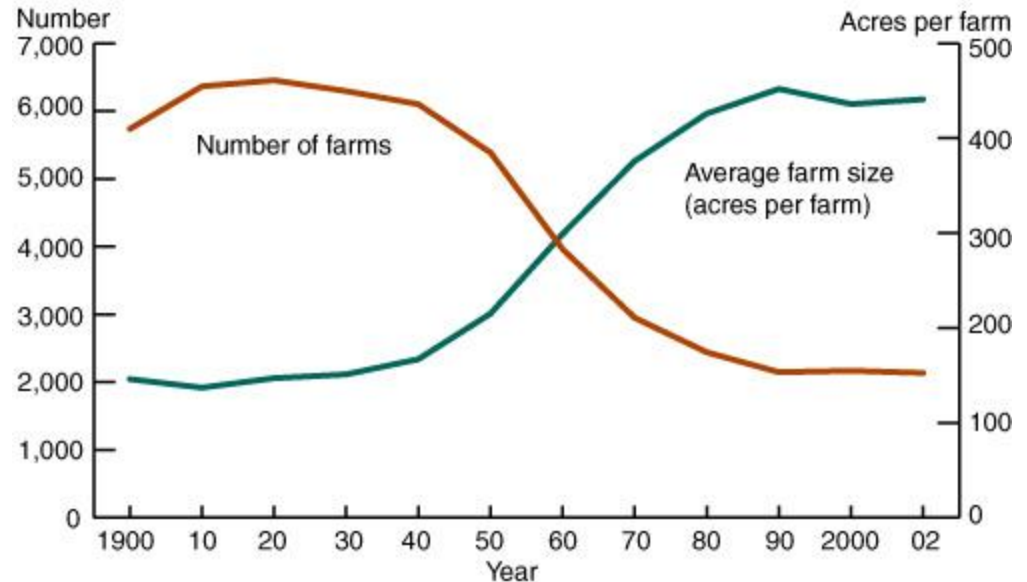
Equipment	March 2008	March 2007	% Chg.	Y-T-D 2008	Y-T-D 2007	% Chg.	Beginning Inventory March 2008
<b>Farm Wheel Tractors - 2 Wheel Drive</b>							
Under 40 HP	8,277	11,961	(30.8%)	17,260	22,138	(21.8%)	62,584
40 & Under 100 HP	5,715	7,806	(26.8%)	13,580	16,643	(18.4%)	35,075
100 HP & Over	2,572	2,287	12.5%	6,127	4,776	<b>28.2%</b>	5,837
<b>Total - 2 Wheel Drive</b>	<b>16,564</b>	<b>22,054</b>	<b>(24.9%)</b>	<b>36,967</b>	<b>43,557</b>	<b>(15.0%)</b>	<b>103,496</b>
<b>Total - 4 Wheel Drive</b>							
	468	363	28.9%	957	731	<b>30.8%</b>	844
<b>Total Farm Wheel Tractors</b>							
	17,032	22,417	(24.0%)	37,924	44,288	(14.0%)	104,340
<b>Combines (Self-Propelled)</b>							
	443	410	8.0%	1,275	1,151	<b>10.8%</b>	965





- Less than 2% of the U.S. population today works in agriculture.
- At the turn of the 20<sup>th</sup> century, one farmer in the U.S. could feed 25 people; today, that ratio is 1:130 (in a modern grain farm, a single farmer can produce cereal to feed over a thousand people).
- With continuing advances in agricultural machinery, the role of the farmer will become increasingly specialized and rare.
- Automation continues to be critical.

Figure 3  
As the number of farms declined, their average size increased



Source: Compiled by Economic Research Service, USDA, using data from *Census of Agriculture*, *Census of Population*, and *Census of the United States*.

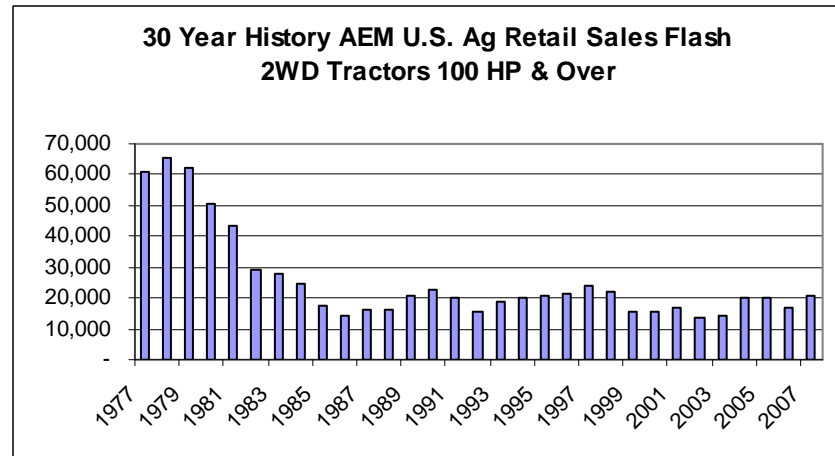
Figure 3: Farms in thousands / 500 acres = 202 hectares

**(Area of farmland almost constant)**





- ❑ Fewer but larger machines have followed the trend to fewer but larger farms.
  - In the 1970s there were approximately 30,000 Combines and 60,000 100+hp tractors sold per year.
  - By the mid 1980s that number had declined to less than 10,000 Combines and 25,000 100+hp Tractors.
  - At the end of 2007, annual sales are 7000 Combines and 20,000 100+hp Ag Tractors.
- ❑ The trend to larger machines, offering higher efficiencies and greater productivity gains will continue.



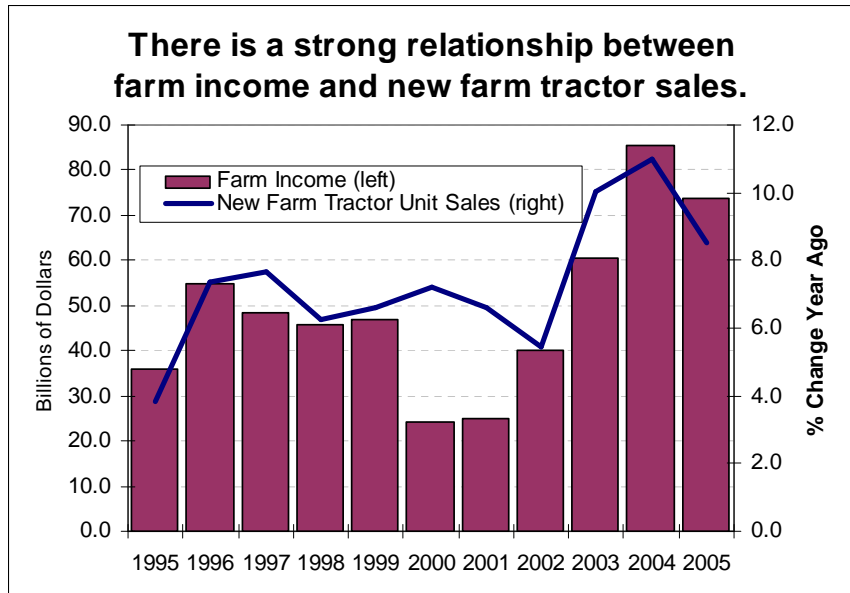
## Effect of Technology Development and Adoption?





## U.S. Agriculture Equipment Manufacturing Industry Facts

- \$82.0 billion in revenue
- \$6.2 billion in exports
- 250,000 employed in industry
- \$8.5 billion payroll
- Regional Economic influence:
  - Minnesota, Illinois, Wisconsin, Iowa, Nebraska
  - California
  - Texas
  - North Carolina, Florida



**Although everywhere, centered in North Central except specialty. Linked to automotive industries.**





# LEGISLATIVE FRAMEWORK AND REGULATIONS PERTAINING TO AGRICULTURE





# The Food, Conservation and Energy Act of 2008 “The Farm Bill”

- Reauthorizes crop subsidies and conservation programs
- Tightens income eligibility limits for farm payments
- Boosts funding for Food Assistance programs
- Expands land conservation programs
- Offers new incentives for alternative energy research and development
- Programs for Farm, Nutrition and Conservation through 2012.
- Overwhelming bi-partisan support in Congress.
- 1000+ Ag groups supported the bill sent to the President
- President Bush vetoed the bill as too expensive, lacking major reform
- Congress overwhelmingly rejected his veto.

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**Also, Specialty Crop Research initiative.**

**Technology emphasized. (But hijacked by horticulturalists?)**



# Example Project

- Carnegie-Mellon University/University of Florida/Deere US\$8,000,000 project
- *“...will produce four safe-guarded, autonomous tractors for mowing and spraying, a mission planner for optimizing coverage routes, and a remote operator control station for configuring, monitoring, and controlling the operation.”*
- Will be tested in south Florida citrus grove



# RESEARCH AND TECHNOLOGICAL INNOVATION



# AEM Research & Technological Innovation

- Biofuels
  - Cellulosic
  - Biomass harvesters
- Autonomous Tractors
- ISOBUS
- Further Commercialization of Precision Farming
- Mechatronics



**A very good list!**



# **Needed Research and Development**

- **Specialty Crop Mechanization**
- **Sensors and Control Systems**
- **Autonomous Vehicles**
- **Integrated Precision Agriculture**
- **High Efficiency Hydraulic and Electric Drives**
- **Vehicle Concepts**
- **Controlled Traffic**



Rome 30-31 May 2008

**Rusty Thanked and Offered to Host Future Meeting**

**AEM is Developing a Show for Orlando**



# Comments From Rusty in Late October

*It may or may not be useful and is strictly one man's opinion:*

**Facts and figures based on the here and now, the bulk of mine and other presentations in Rome, are becoming less relevant today due to wild swings in indicators affecting world business including finance, politics, commodity prices, environmental issues, and other factors affecting everyone, not just those of us in Agriculture. Cases in point: oil prices, corn and grain prices, the value of the dollar, ... . The plus or minus impact of these important factors, depending on your perspective, have completely shifted in the short time since our visit in Rome. What people are clamoring about and wringing their hands about today may not be relevant tomorrow.**

# Comments From Rusty in Late October

*It may or may not be useful and is strictly one man's opinion:*

... To keep it short, our movement from an post WWII Semi-Agrarian society to the predominantly high tech culture of today has, and is continuing to drive the development of the Ag machines necessary for feeding and clothing our population and for the continuing growth of our Ag export business. Socio-economic factors will ultimately do the same for all emerging countries with adequate arable land, possibly at a faster pace. ...

Simply put, increasing affluence and higher education levels ultimately lead to a declining Ag labor force and a higher demand for Ag products. These conflicting factors are the economic drivers for larger farms, larger machines, increasing automation and a very positive outlook for Agriculture.

# Testimony Before US Congress

28 October 2008

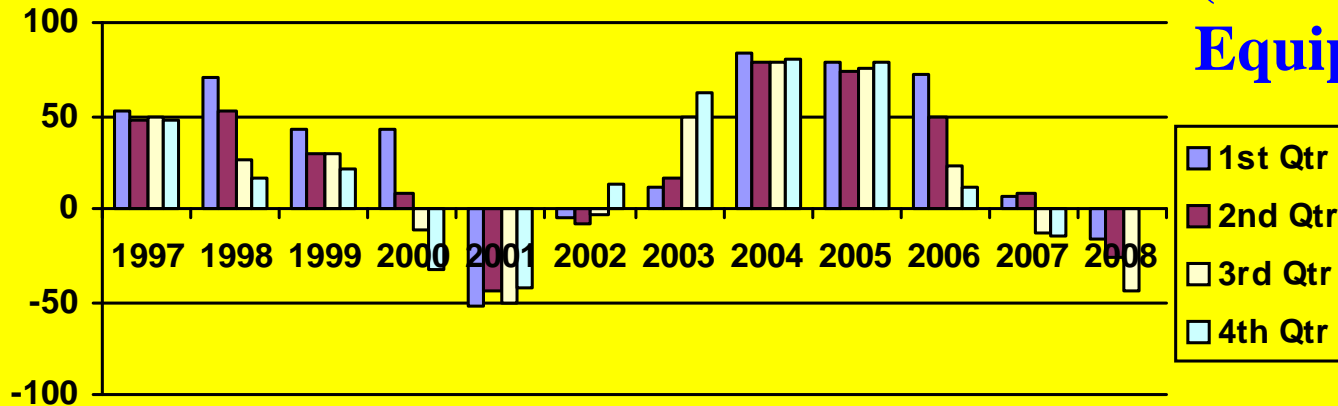
## Richard A. Brown

- **President --- Krause Corporation**
  - Tillage equipment manufacturer since 1916
  - 225 Employees
- **Chairman of AEM Small Enterprise Committee**
  - 769 companies in 44 states
  - Construction, agriculture, utilities, mining, forestry
  - <\$250M each, but combine to >\$12B

# Charts Used in Testimony

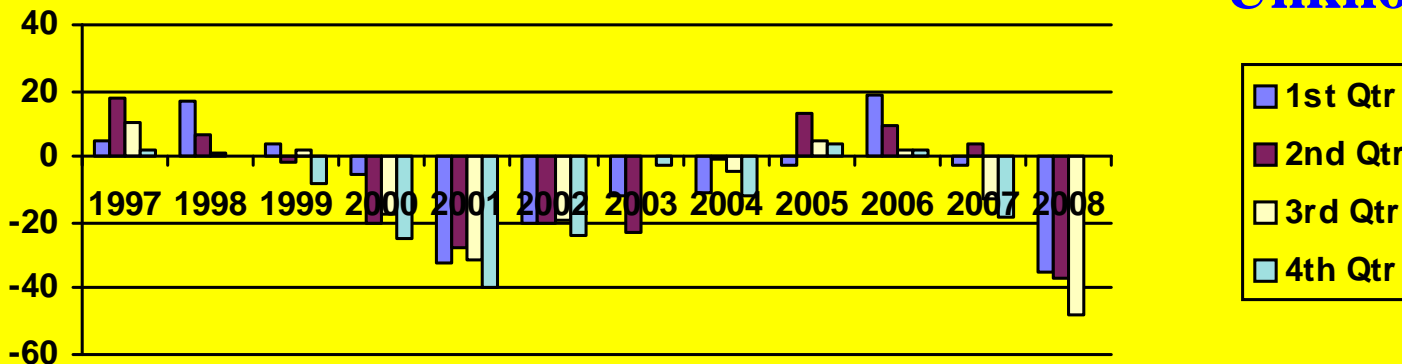
Unit Volume of Demand

(Construction Equipment)



Profit Margins

(Basis Unknown)



**Mr. Brown told a story of a small South Carolina manufacturer who lost line of credit when Wachovia bank had problems and other banks would only lend to some of their own past customers.**

**(Personal Note: Before CIGR-Brazil I had to visit 3 ATM's before finding one that would take my Wachovia card!)**

# **Farmers are having difficulty getting credit while**

**The U.S. Department of Agriculture (USDA) estimates a 36 percent increase in crop-related expenses in 2008.**

**USDA also estimates that since 2002, for the 14 major crops grown in the U.S., fertilizer expenses have increased 175 percent, seed expenses have increased 72 percent, and pesticide expenses have increased 29 percent.**

**“We are now seeing farmers delay the purchase of these inputs from their "normal" pre-season purchasing patterns as they are having trouble accessing credit and are hesitant to pay such steep prices.**

**The ripple effects of tightening credit markets at a time of increasing capital requirements for agriculture will lead to economic hardships for rural America.**

**I can also say that I personally perceive a sense of anger among rural Americans about this situation.**

**Generally speaking, they did not buy homes they could not afford or run up huge credit card debt, but now are forced to deal with the consequences of other people's excesses and as a consequence are losing faith in the system.”**

# Recommendations for US Congress

- **Extend the Bonus Depreciation and Enhanced Expensing Provision**
- **Invest in Infrastructure**
- **Help Small Businesses Export**
- **Help Control Rising Health Care Costs**
- **Continue the Government's Commitment to Renewable Fuels**



# ***Barack Obama and Joe Biden's Plan***

- **Ensure Economic Opportunity For Family Farmers**
  - **Strong Safety Net for Family Farmers**
  - **Prevent Anticompetitive Behavior Against Family Farms**
  - **Regulate CAFOs**
  - **Establish Country of Origin Labeling**
  - **Encourage Organic and Local Agriculture**
  - **Encourage Young People to Become Farmers**
  - **Partner with Landowners to Conserve Private Lands**

# ***Barack Obama and Joe Biden's Plan***

- ***Support Rural Economic Development***
  - Support Small Business Development
  - Connect Rural America
  - Promote Leadership in Renewable Energy
- **Improve Rural Quality Of Life**
  - Combat Methamphetamine
  - Improve Health Care
  - Improve Rural Education
  - Upgrade Rural Infrastructure

# Questions??

**John Schueller --- *schuejk@ufl.edu***

**[www.agrievolution.com/en/atti.php](http://www.agrievolution.com/en/atti.php)**

**[www.aem.org](http://www.aem.org)**

**[www.c-span.org](http://www.c-span.org)**

**[www.barackobama.com/issues/rural](http://www.barackobama.com/issues/rural)**