Key Supply-Demand Factors "Driving" Grain Markets

KSU Agricultural Economics 605

March 14, 2017

DANIEL O'BRIEN
EXTENSION AGRICULTURAL ECONOMIST

KANSAS STATE UNIVERSITY | Department of Agricultural Economics

Grain Market "Drivers"

Key issues affecting grain markets over the 1998-2017 Period

1) **Major Demand Shocks** – U.S. biofuels use & Chinese soybean imports

2) **Ag Market Price Responsiveness** – Flexibility of Ag Prices

3) **Favorable Weather & Increased Grain Stocks**

4) **Chinese Agricultural Stocks Policy** – Feedgrain impacts

5) **Macroeconomic Factors** – U.S. & World

Grain Market "Drivers"

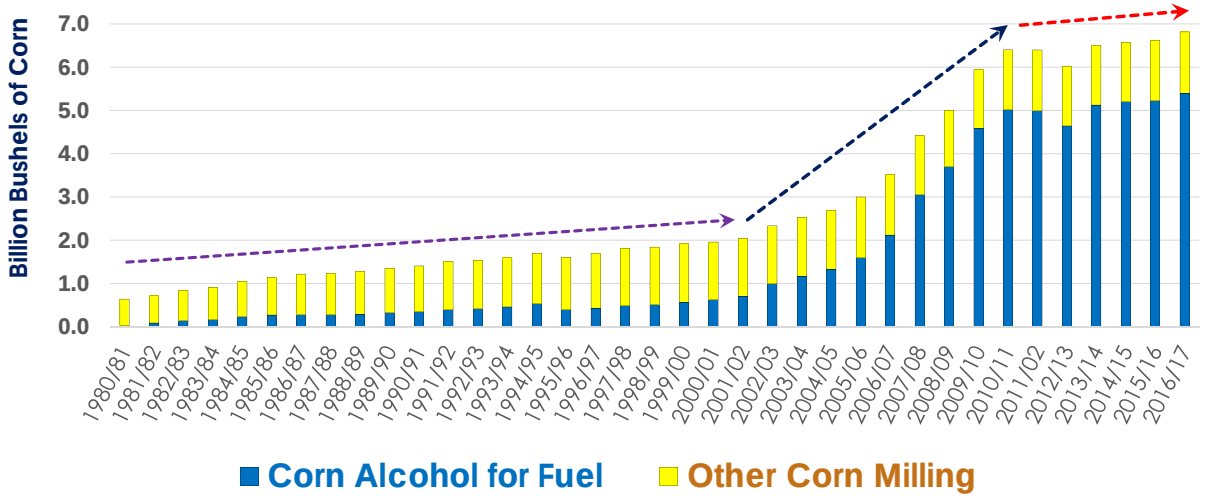
Key issues affecting grain markets over 1998-2017 Period

1) Major Demand Shocks

- U.S. biofuels use
- China soybean imports

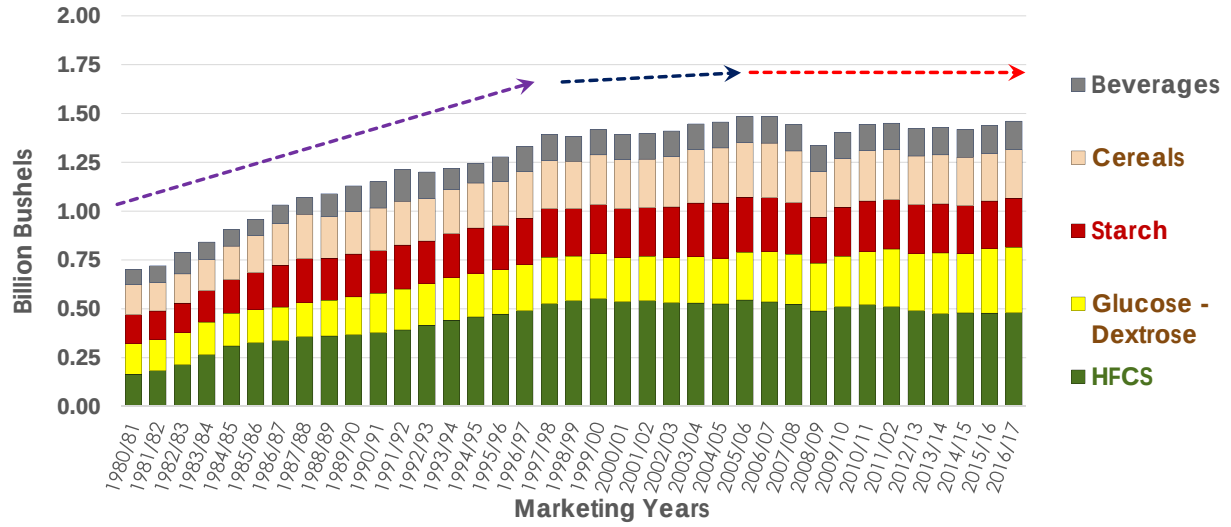
Major Demand Shocks:

Growth in **U.S. Corn Biofuel Use** & Other Processing



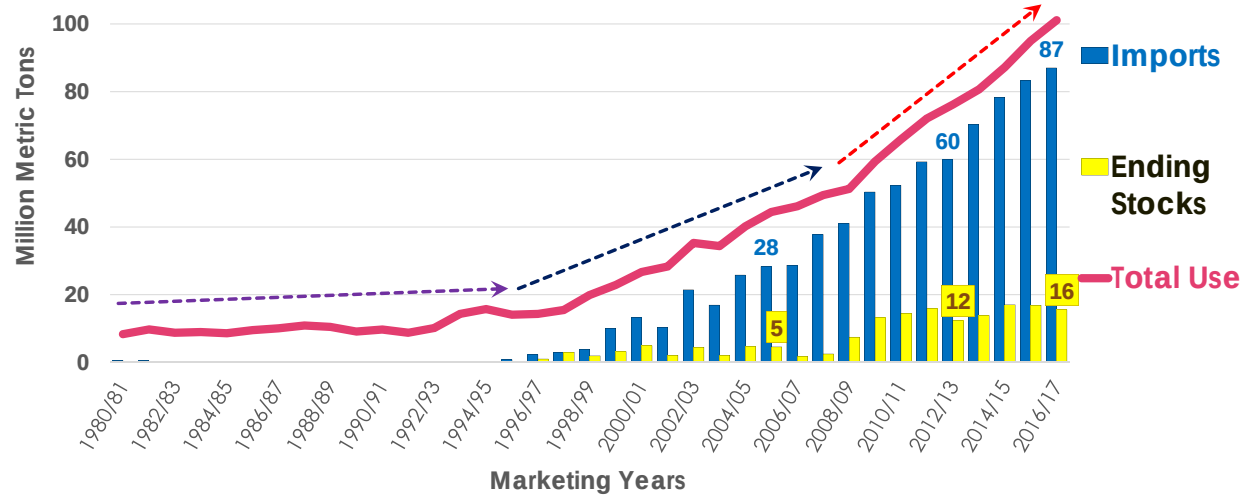
Major Demand Shocks:

Steady U.S. Wet Corn Milling Demand

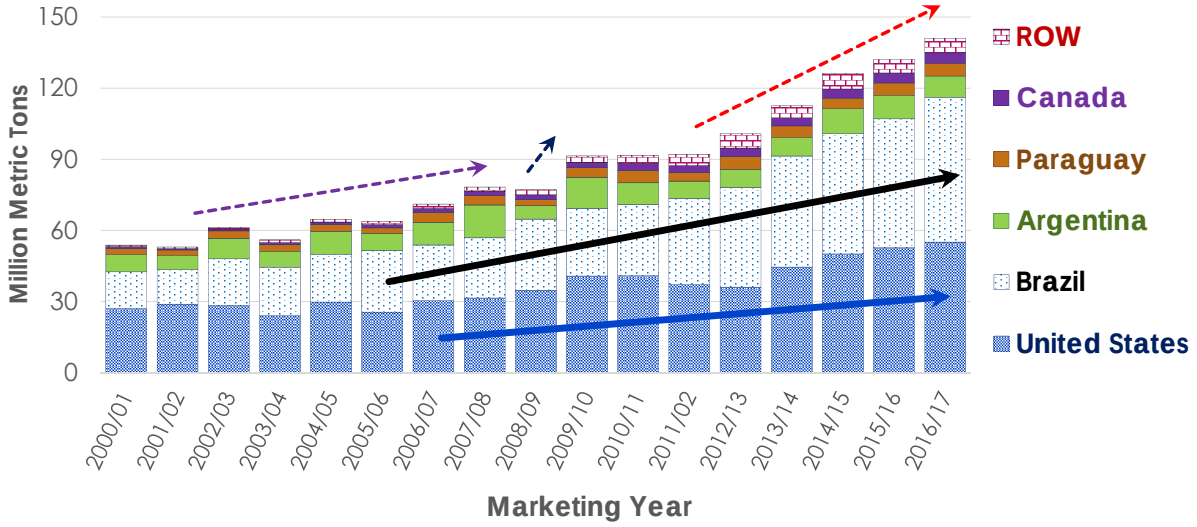


Major Demand Shocks:

China Soybean Use, Imports & Ending Stocks



Major Demand Shocks:
Major World Exporters of Soybeans



Q? What will be the future for these major demand drivers in the grain markets?

Q1? Can feedgrain use for U.S. ethanol & other milling processes begin trending *higher* again?

- *E-15 adoption, DDGS & ethanol exports, corn products?*

Q2? Will Chinese soybean imports continue to grow?

- *Livestock feed demand, inelastic food use demand, continuing free trade with the U.S. & other countries?*

Grain Market "Drivers"

Key issues affecting **grain markets** over 1998-2017 Period

2) Market Price Responsiveness

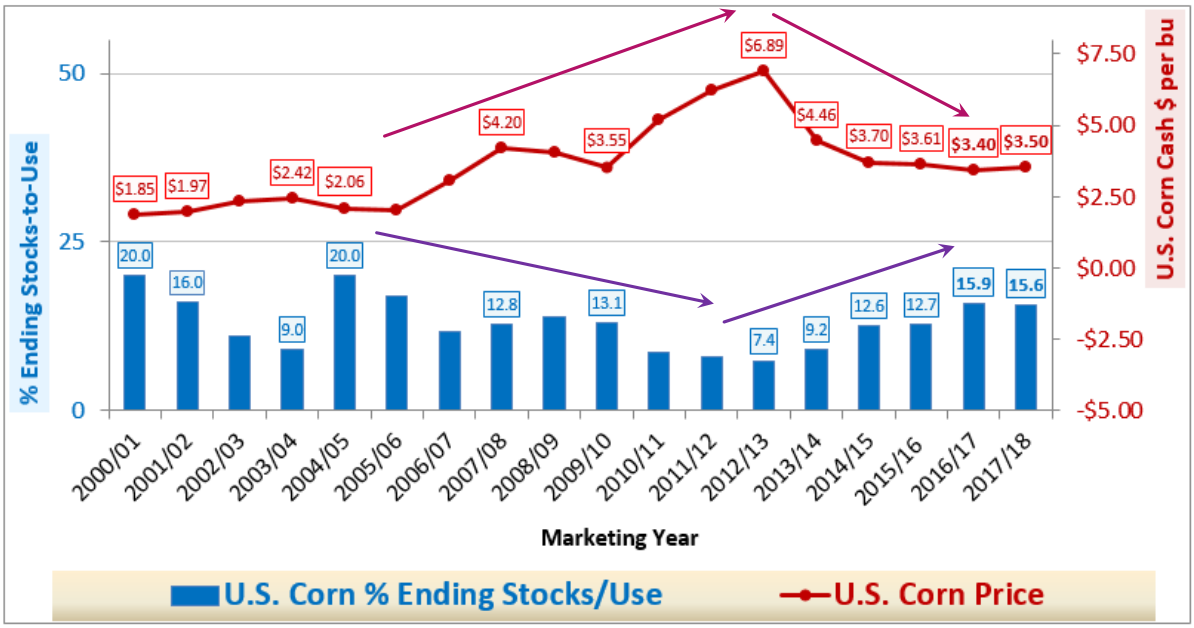
- The ***Flexibility*** of agricultural market price responses

  - **Elasticity** = %ΔQuantity / %ΔPrice

  - **Flexibility** = %ΔPrice / %ΔQuantity

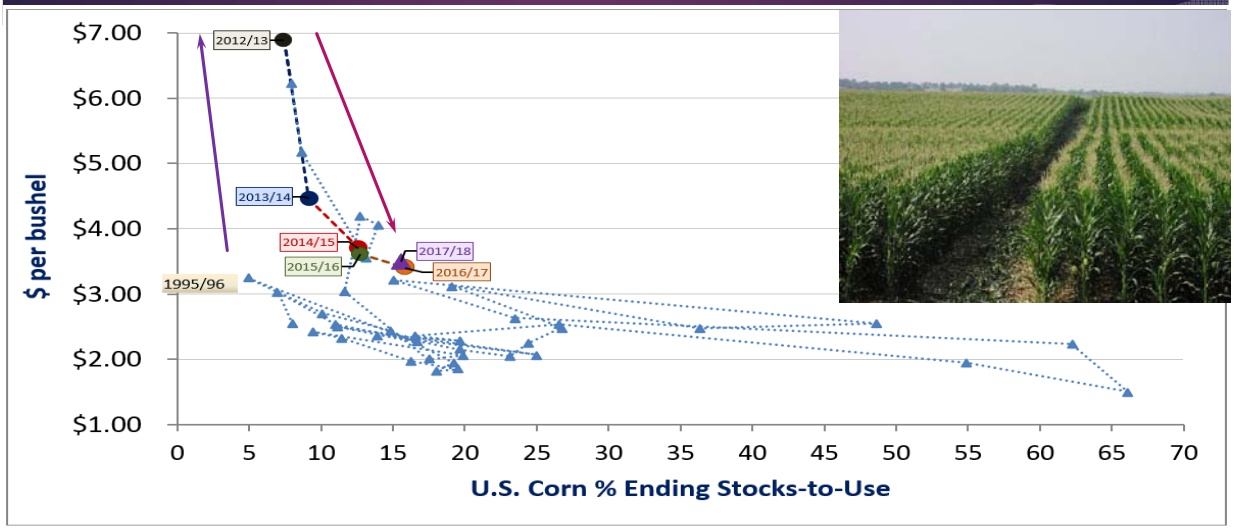
U.S. Corn % Ending Stocks vs U.S. Corn Avg. Cash Prices

MY 2000/01 – projected "Next Crop" MY 2017/18



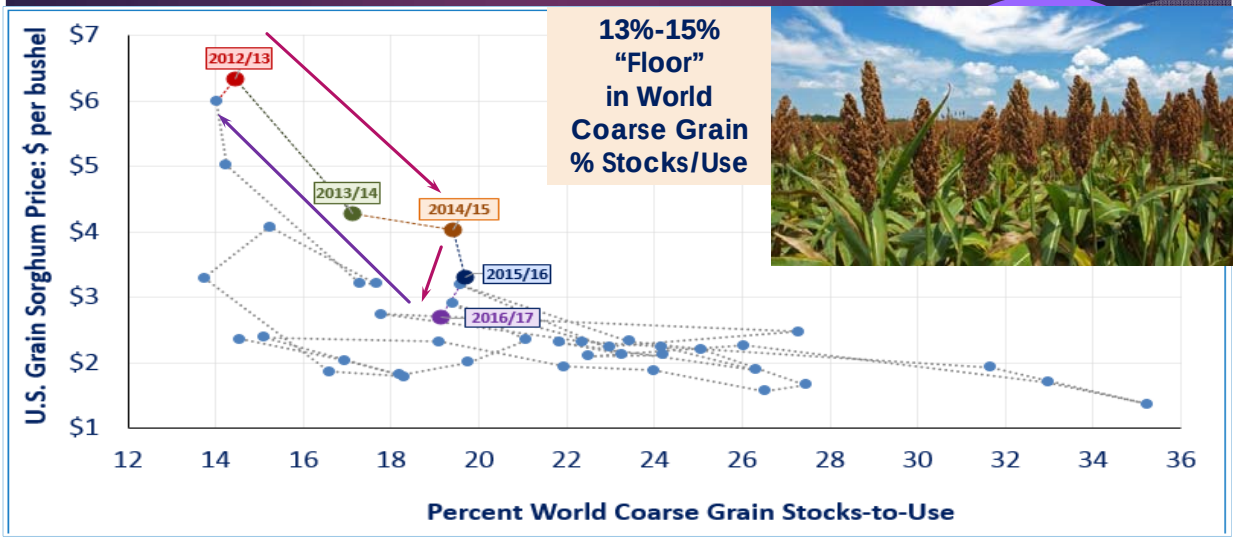
U.S. Corn Price$ vs U.S. % Stocks-to-Use

MY 1973/74 through "Next Crop" MY 2017/18



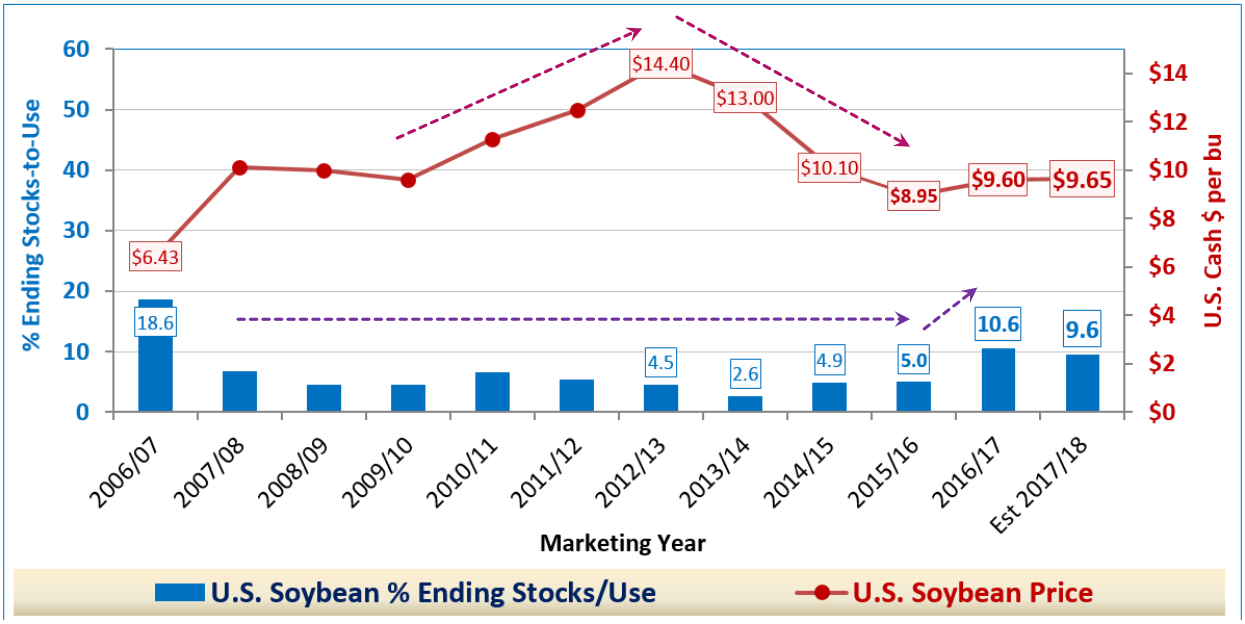
U.S. Sorghum$ vs World Coarse Grain %S/U

MY 1973/74 through "Current" MY 2016/17



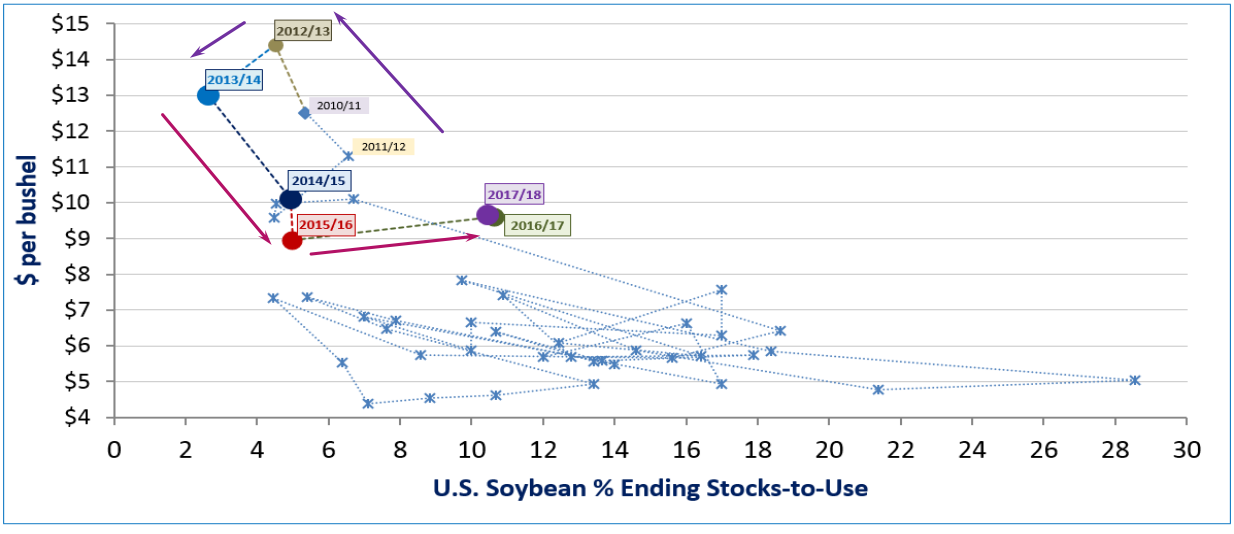
U.S. Soybean Ending Stocks vs U.S. Avg. Cash Prices: MY 2006/07 – "Next Crop" 2017/18Est

As of the February 23-24, 2017 USDA Outlook Forum and March 9, 2017 WASDE Report



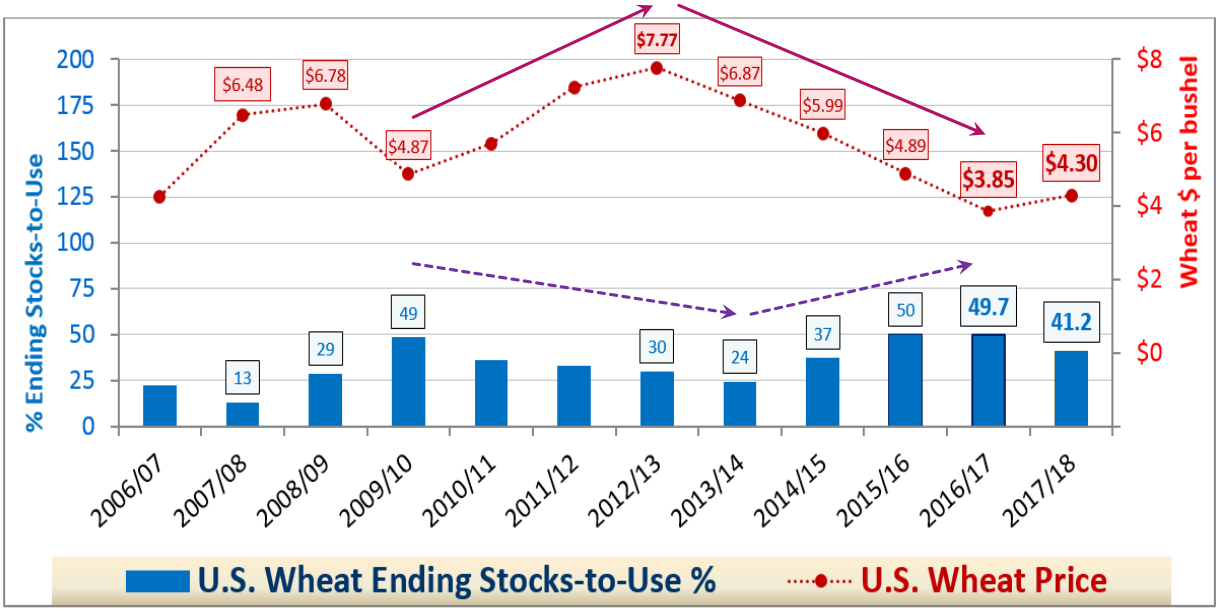
U.S. Soybean $ vs U.S. Stx-to-Use

MY 1973/74 through "Next Crop" MY 2017/18



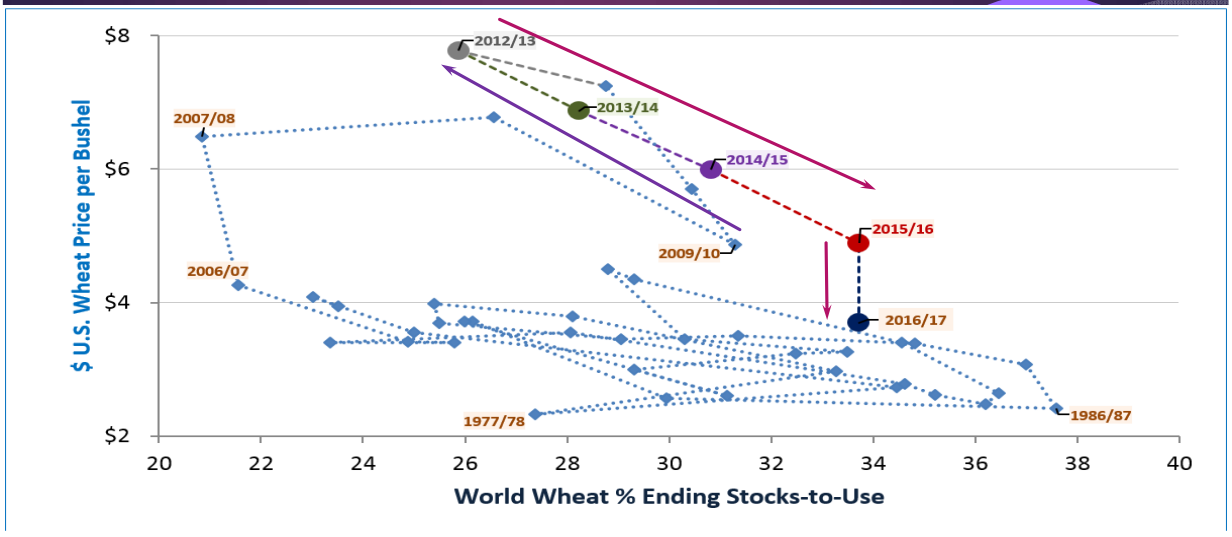
U.S. Wheat Ending Stocks vs U.S. Cash Prices: MY 2006/07 thru "Next Crop" 2017/18

As of the February 23-24, 2017 Agricultural Outlook Conference & the March 9, 2017 WASDE report



U.S. Wheat Price$ vs World %Stocks/Use

MY 1973/74 – "Current" MY 2016/17



Q? Which categories of grain demand are most "*price inflexible*"? $p^{\$} = f(q^{bu})$

- **U.S. Corn ⇨ Ethanol use (RFS driven) & Wet Milling**
  - *Livestock feed use & exports more price responsive*
- **U.S. Wheat ⇨ Domestic Food use**
  - *Exports & livestock feed use are more price responsive*
- **U.S. Soybeans ⇨ Crush for SoyOil & SoyMeal**
  - *Soybean exports are price responsive ("interplay" with South America)*
- **U.S. Sorghum ⇨ Exports** (were in 2014-15 with China – not currently)

Grain Market Behavior Over Time

Economic principles shown in market patterns over time

▶ **The focus of grain markets tend to vary seasonally**

- **Pre-harvest** ⇨ Focus on "***Crop Production Impacts***" (Flexibility)

  Price = fn(Supply): How supply-demand & price scenarios may be affected by varying $ response to "short" vs "abundant" Stocks/Use market scenarios

- **Harvest & Post-harvest** ⇨ Focus on "***Crop Use Impacts***" (Elasticity)

  Use = f(Prices): How crop demand & total use will be affected by "high" vs "low" prices

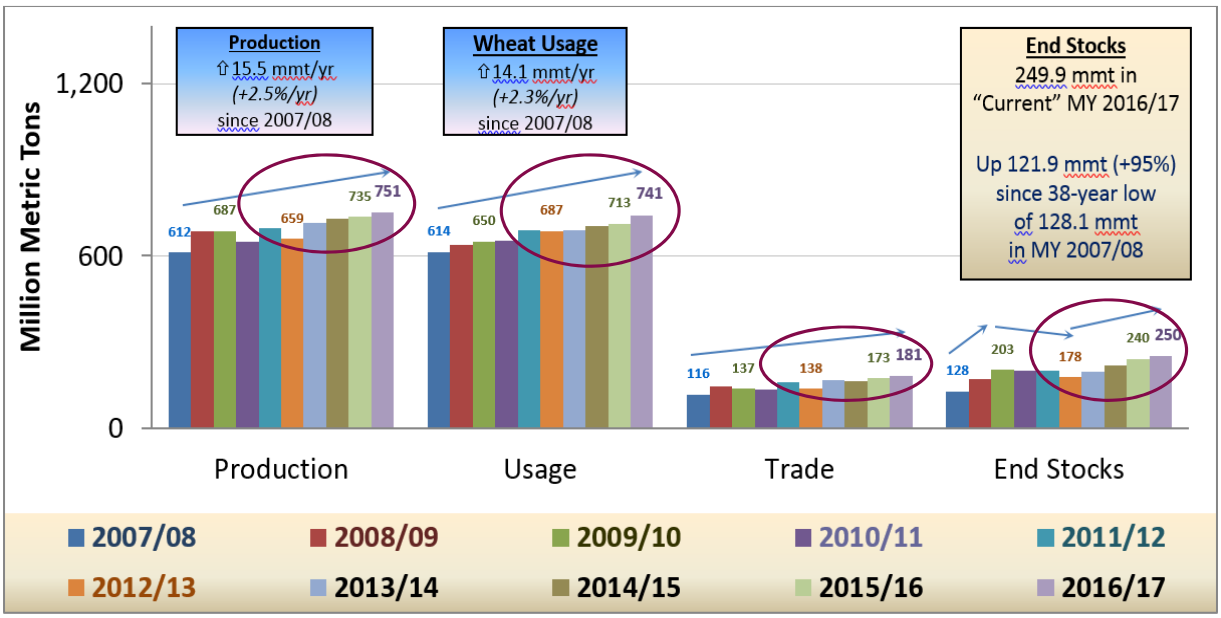
Grain Market "Drivers"

Key issues affecting grain markets over 1998-2017 Period

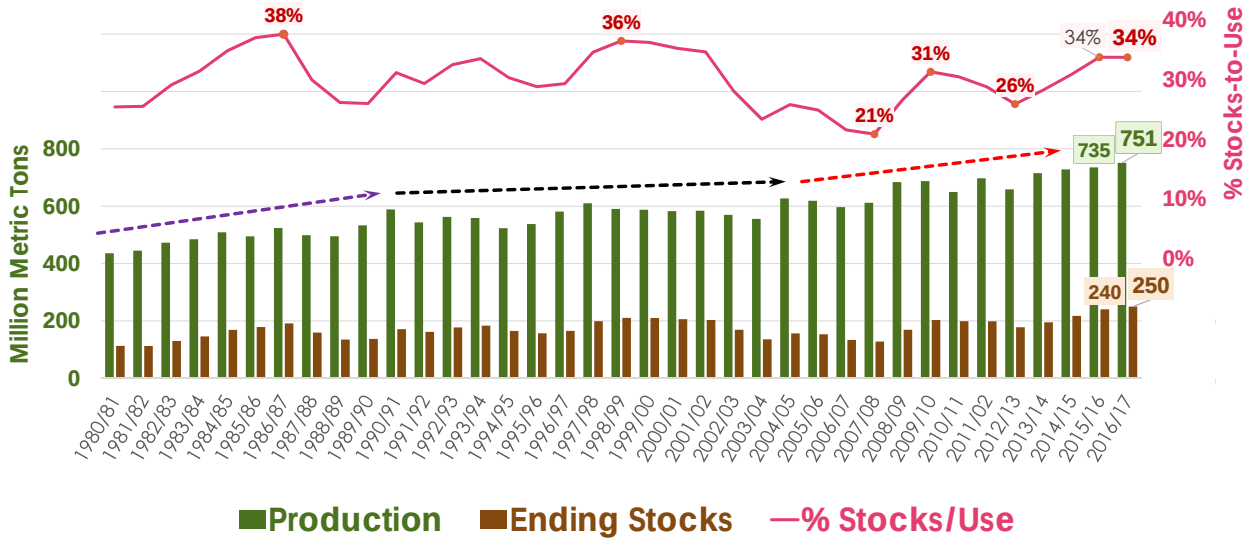
3) Favorable Weather & Increased Grain Stocks

World Wheat Usage & Ending Stocks: MY 2007/08 thru "Current" MY 2016/17

As of the March 9, 2017 WASDE report

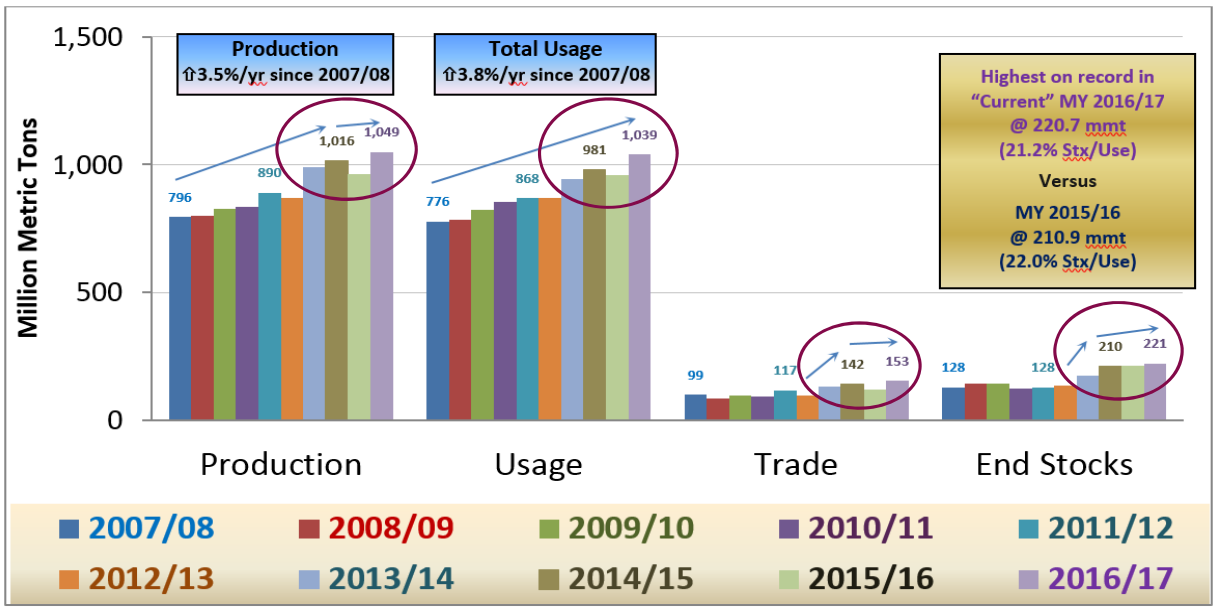


World Wheat Production & Stocks

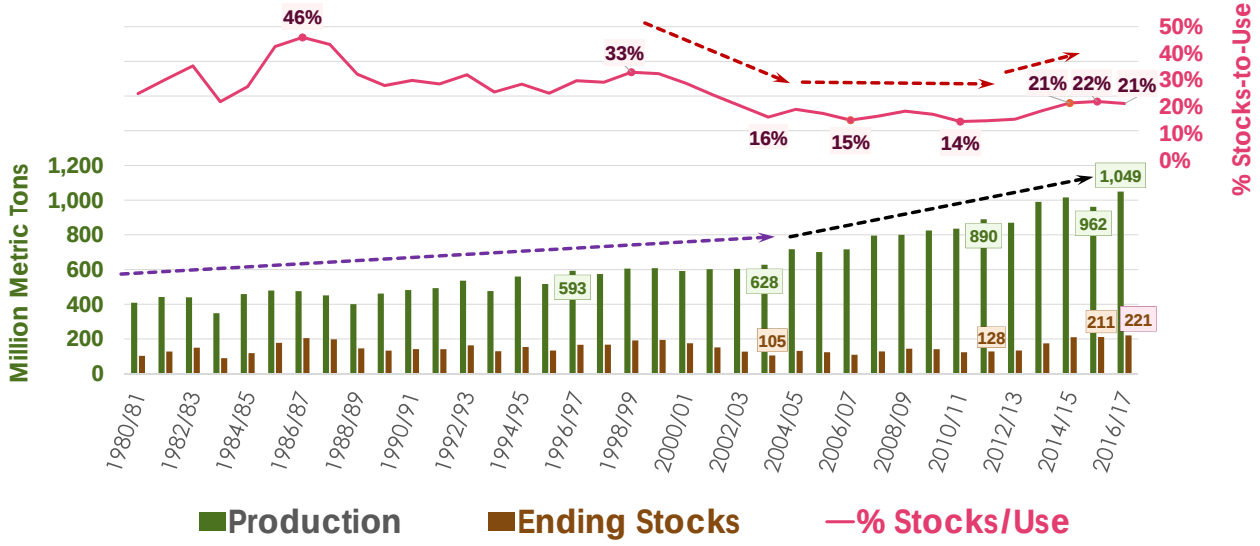


World Corn Supply-Demand: MY 2007/08 thru "Current" MY 2016/17

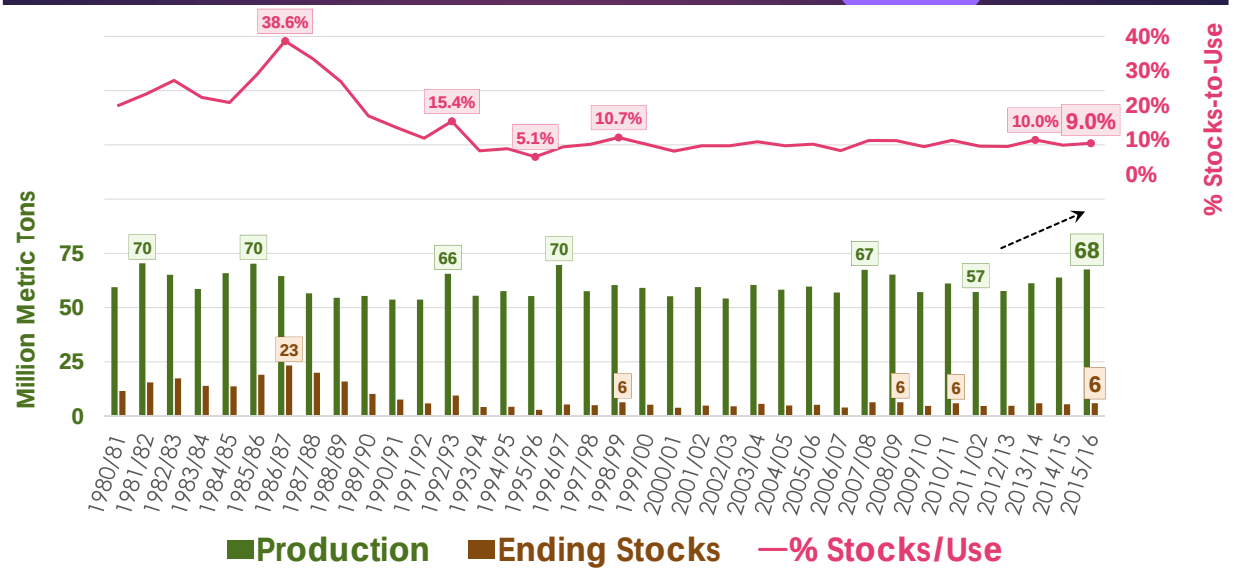
As of the March 9, 2017 USDA WASDE Report



World Corn Production & Stocks

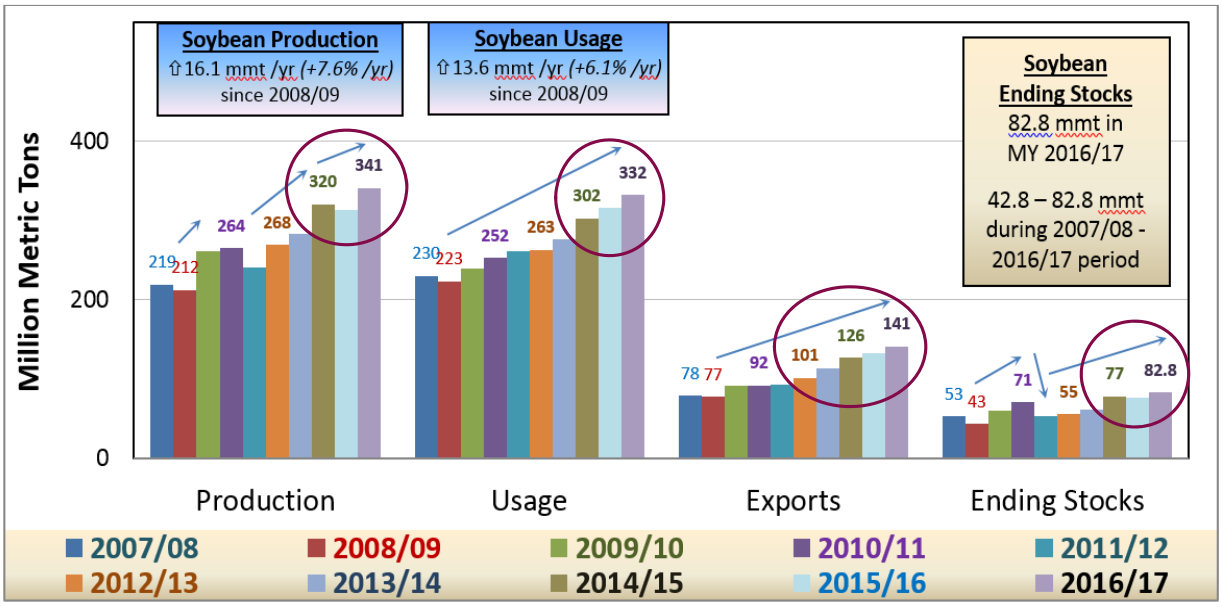


World Sorghum Production & Stocks

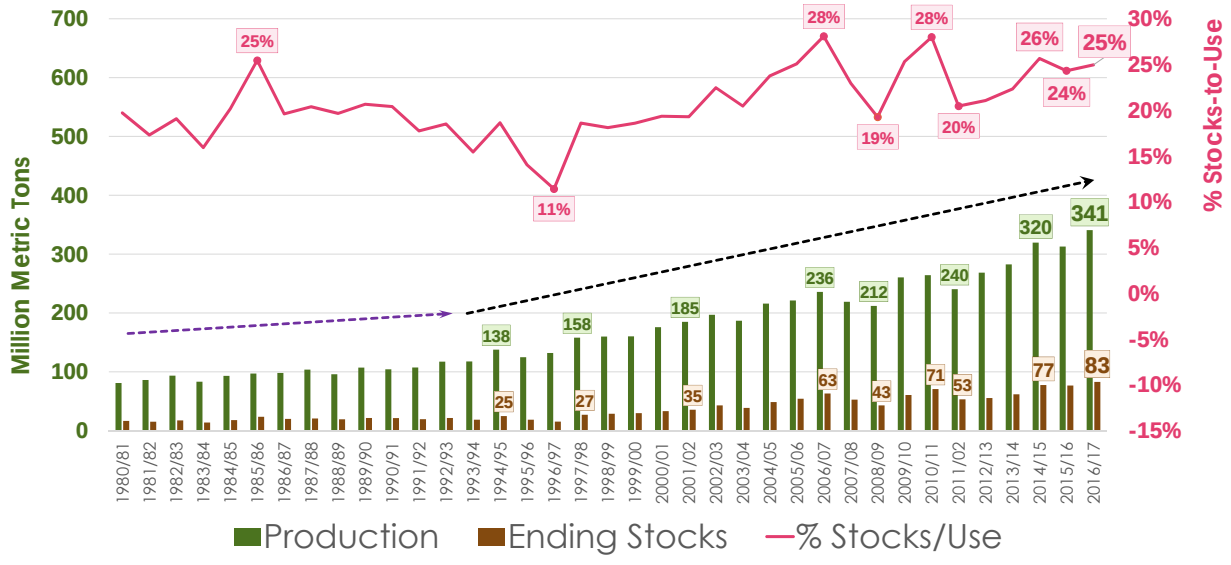


World Soybean Usage & Ending Stocks: MY 2007/08 thru "Current" MY 2016/17

As of the March 9, 2017 WASDE Report

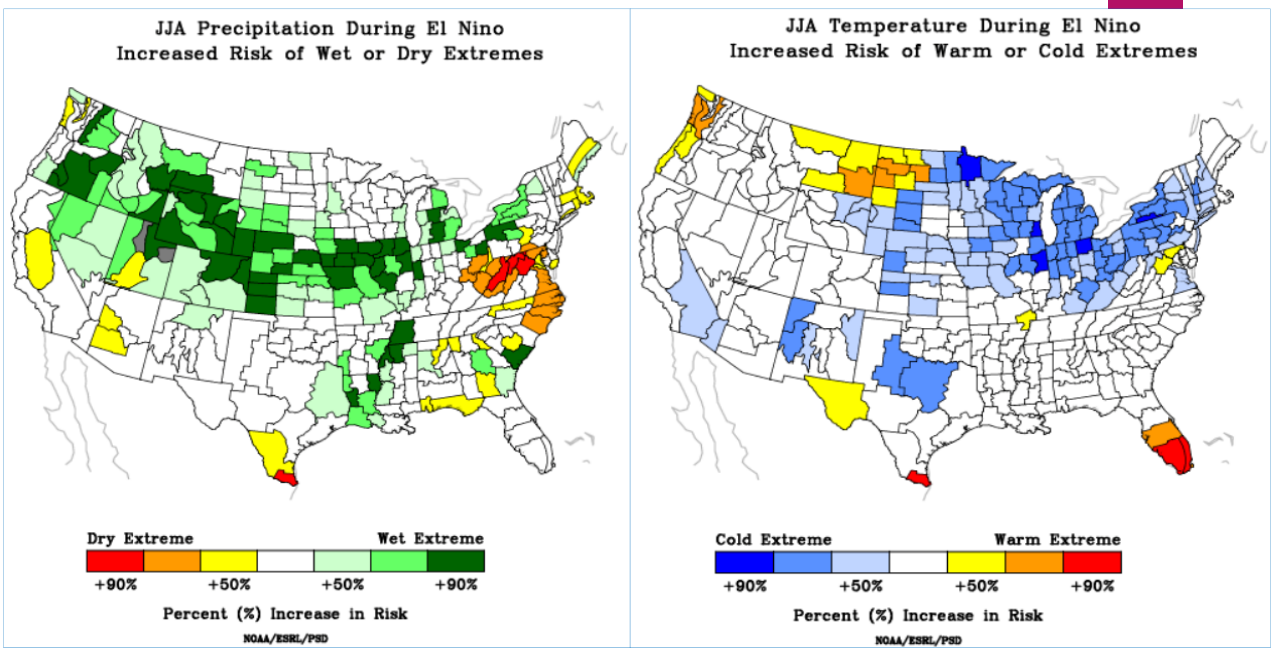


World Soybean Production & Stocks



Q? Will record high crop production continue in 2017-2018+

- **Weather Patterns** – *La Nina to El Nino Impact on U.S.?*
  - "ENSO-neutral conditions are favored to continue through at least the Northern Hemisphere spring 2017, with increasing—but uncertain—chances for **El Niño development** into the fall." (Climate.gov - 3/13/2017)
  - "With **La Niña** in the rear-view mirror, forecasters expect that neutral conditions will continue through the spring. After that, there are increasing chances of **El Niño** making an appearance, but they're still not very strong chances—around **50% by the late summer**, but not quite at the point to warrant an El Niño Watch." (Climate.gov - 3/8/2017)



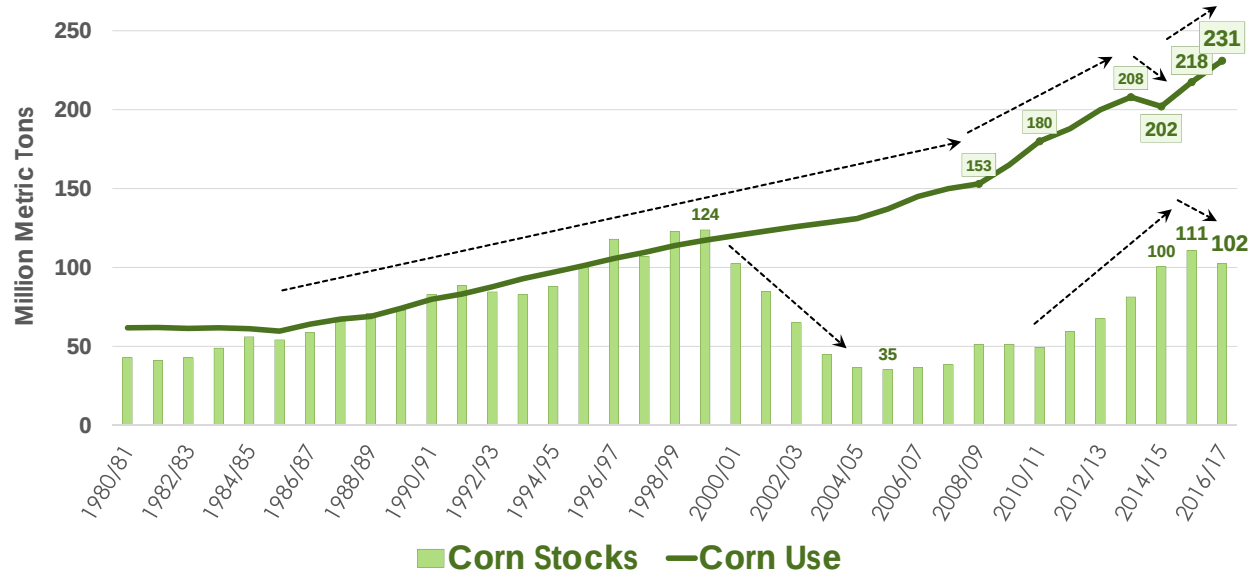
Grain Market "Drivers"

Key issues affecting grain markets over 1998-2017 Period

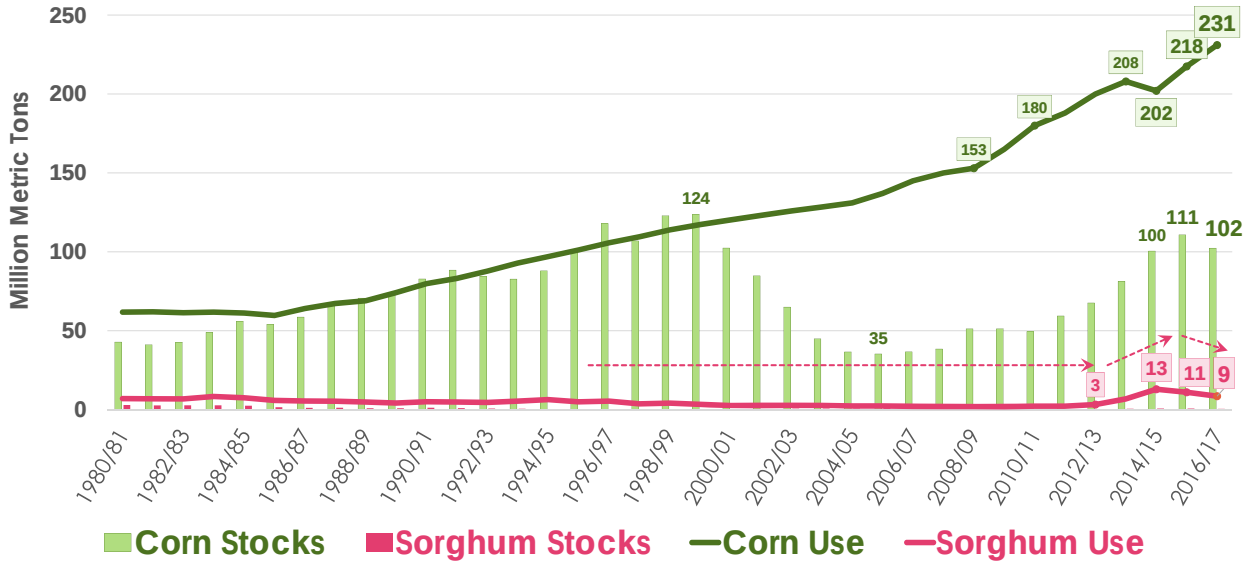
4) Chinese Agricultural Stocks Policy

- Feedgrain impacts ⇨ *Sorghum Imports in 2014-15*

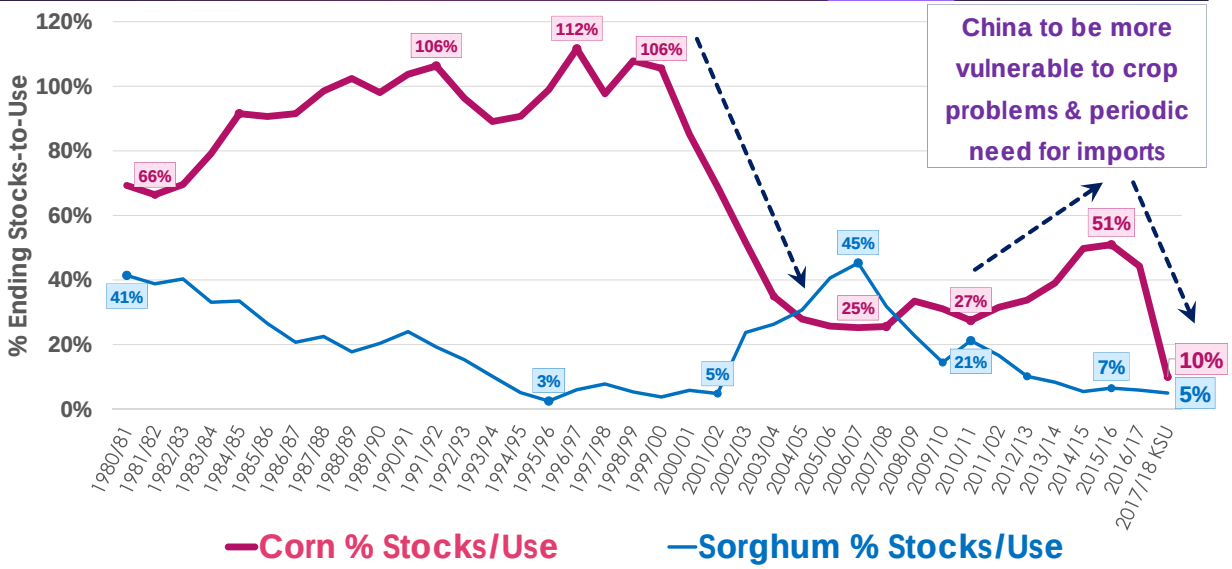
China Corn Use & Stocks



China Corn & Sorghum Use - Stocks



China Corn & Sorghum % Stocks/Use

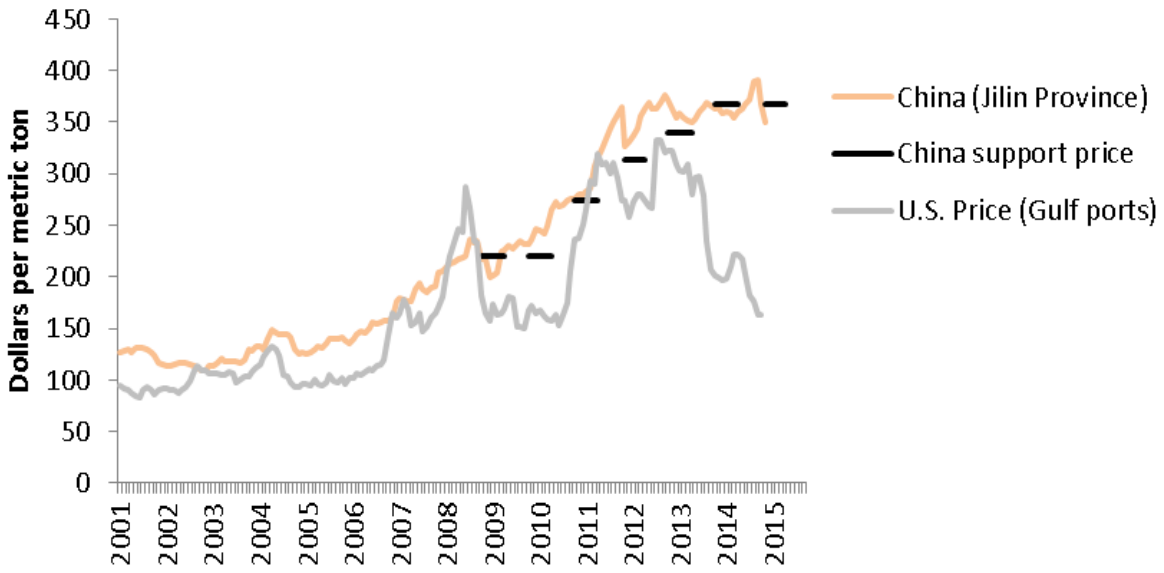


China Corn & Soybean S-D (China Ministry of Ag, March 2017)

China corn supply and demand (Ministry of Ag, March 2017)				
Item	Unit	2015/16	2016/17 Feb	2016/17 Mar
Planted area	1000 ha	38,117	36,026	36,026
Harvested area	1000 ha	38,117	36,021	36,021
Yield	Kg/ha	5,892	5,978	5,978
Production	MMT	224.58	215.33	215.33
Imports	MMT	3.2	0.8	0.8
Consumption	MMT	194.09	211.22	211.22
--Food	MMT	7.65	7.82	7.82
--Feed	MMT	121.01	133.53	133.53
--Industrial use	MMT	54.17	58.25	58.25
--Seed	MMT	1.66	1.61	1.61
Loss and other	MMT	9.56	10.01	10.01
Exports	MMT	0.01	0.5	0.5
Surplus	MMT	33.73	4.41	4.41

China soybean supply and demand (Ministry of Ag, March 2017)				
Item	Unit	2015/16	2016/17 Feb	2016/17 Mar
Planted area	1000 ha	6,590	7,156	7,156
Harvested area	1000 ha	6,590	7,150	7,150
Yield	Kg/ha	1,762	1758	1758
Production	MMT	11.61	12.57	12.57
Imports	MMT	83.23	85.31	85.31
Consumption	MMT	96.67	99.87	99.87
--Crushing	MMT	82.89	85.50	85.50
--Food	MMT	10.35	11.18	11.18
--Seed	MMT	0.54	0.61	0.61
Loss and other	MMT	2.89	2.58	2.58
Exports	MMT	0.11	0.2	0.2
Surplus	MMT	-1.96	-2.19	-2.19

China and U.S. Corn Prices, 2001-15



Q? How quickly & completely will China lower it's domestic corn support prices?

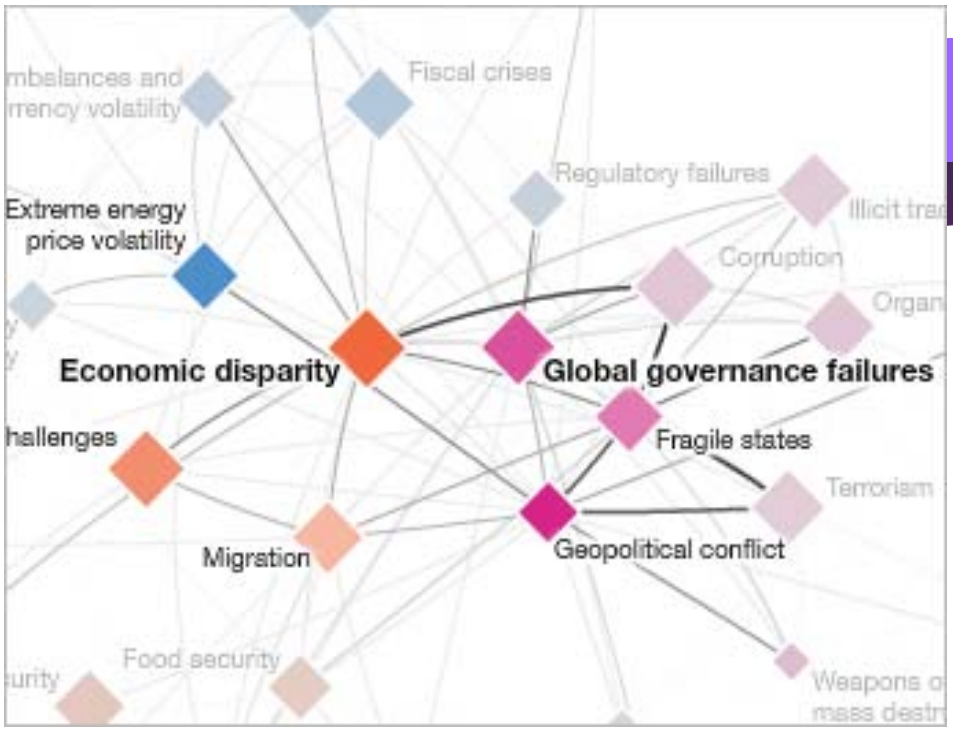
- **China is making *step-wise reductions* in domestic corn support prices over the next several years**
  - *Attempting to balance "domestic production incentives" for Chinese farmers with their burdensome oversupply/stockpile problem*
- **Impact on U.S. grain sorghum export demand?**
  - *China will continue to seek the "**best deal**" it can find between corn & sorghum, from whatever country is the low cost, quality, reliable source.*
  - ***But**, China has now found that U.S. sorghum is a viable use option* D. O'Brien KSU

Grain Market "Drivers"

Key issues affecting grain markets over 1998-2017 Period

5) Macroeconomic Factors

- Currency Exchange Rates
- Weak World Economies & Energy Markets
- Other Risks (geopolitical, etc)



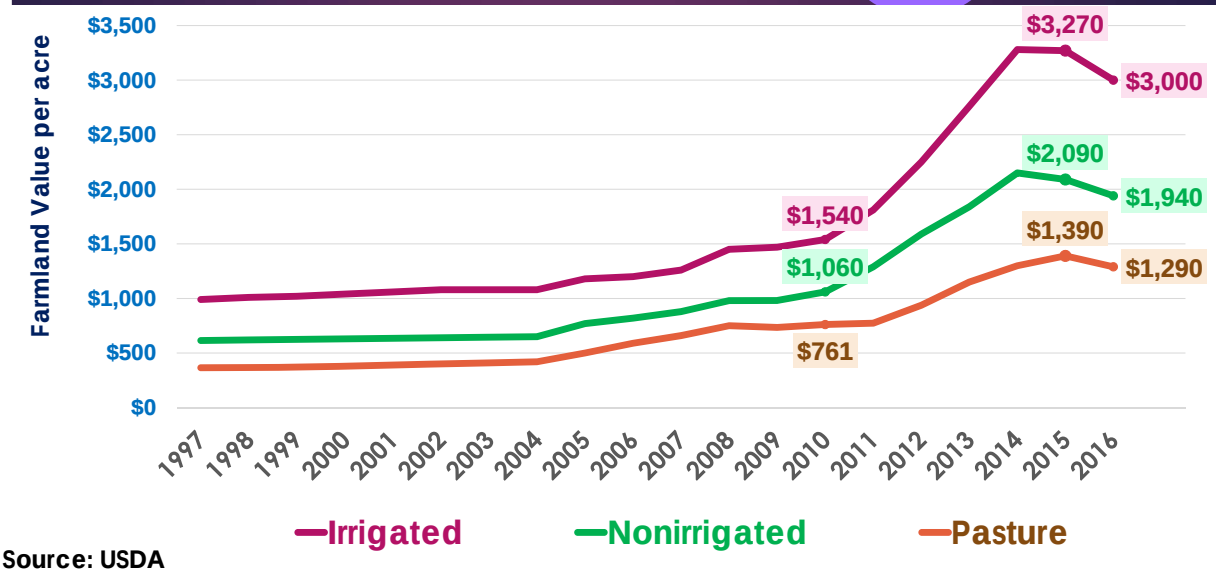
U.S. Dollar Index (ICE Futures)

Monthly Chart: January 2008 – February 28, 2017 + 3/13/2017

Q? Do U.S. / World financial & economic factors impact U.S. grain markets?

- **Direct Impact** of high U.S. dollar on Exports
  - ***U.S. Wheat Exports*** ⇨ *"high cost, last resort supplier" in the World*
  - *Reducing **U.S. corn & soybean exports** "on the margin"*
    (effect is mitigated by limited # of export competitors)
- **Indirect Impact** of a ***inflation fears*** on U.S. agriculture?
  - ***Higher interest rates, tighter credit*** *& higher **risk** – causing lower net returns in U.S. agriculture*

Kansas Farmland Values: 1997-2016



Source: USDA

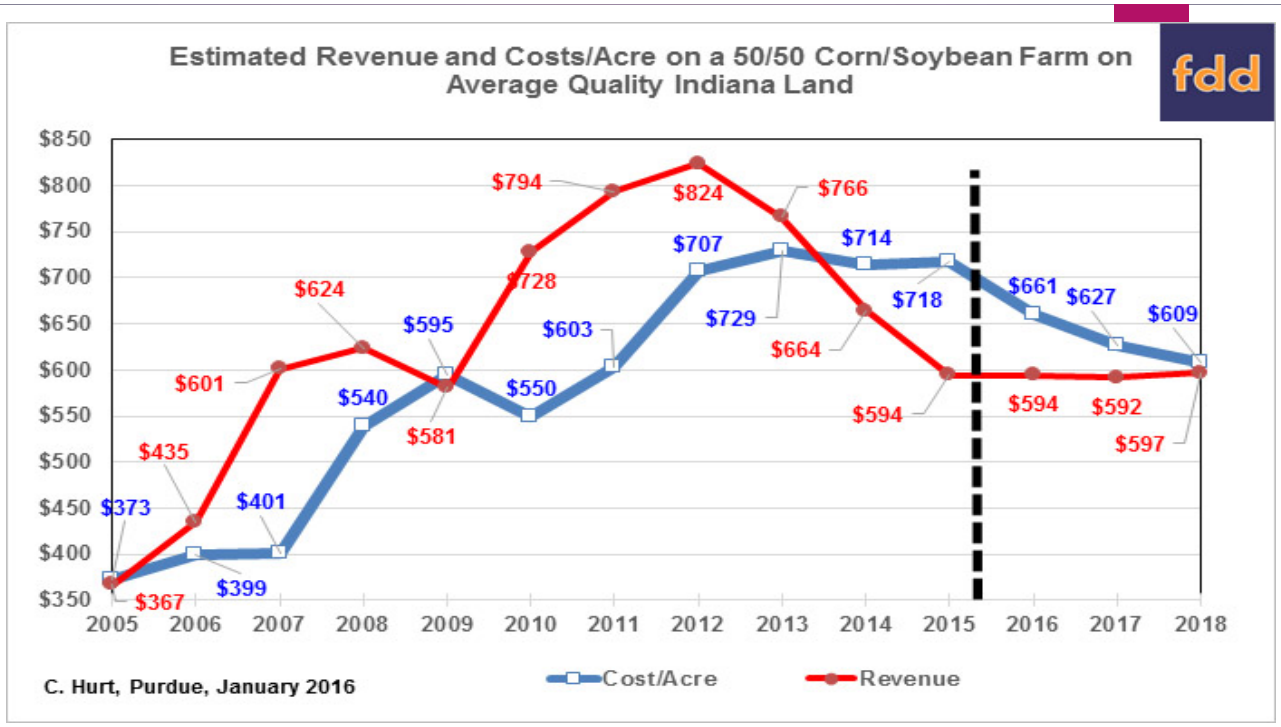
U.S. Grain Transportation & Trade

- **Transportation Logistics have Impacted Grain Exports**
  - *U.S. exports have been limited by **higher shipping costs** to key markets versus the Black Sea, Australia & other competitors*
  - ***Panama Canal improvements** may help U.S. export competitiveness to Asian markets*
  - ***U.S. Railroad Shipping Capacity Issues***
    - *Periodic winter weather events cause slowdowns in shipping grains from the U.S. Midwest to either the Louisiana Gulf or Pacific NW*

Grain Market Behavior Over Time

Economic principles shown in market patterns over time

- **Prices tend to return to breakeven cost over time**
  - **High grain prices & profits** lead to economic responses that eventually cause **lower prices & losses** (& vice verse)
  - Evidence in **U.S. Corn**, **Soybean** & **Wheat** markets over the 2005-2016 period
  - The economic principal of "***Mean Reversion***" in prices over time



The Dynamic, Cyclical Nature of U.S. Agricultural Supply-Demand & Profitability

- ***"Thinking Beyond Stage 1"*** (Economist Thomas Sowell)
- ***D. O'Brien[KSU] Perspective:***
  - *"Short term profits & losses impact U.S. farmers' profit maximizing decisions regarding crop & livestock production, what they pay for farm assets, & grain-livestock prices."*
  - *"We need to be aware of the dynamic nature of U.S. agricultural supply-demand & profitability over time."*

Questions?

Daniel O'Brien – Extension Agricultural Economist

Kansas State university

dobrien@ksu.edu

KSUGrains on Twitter & Facebook

www.AgManager.info

KANSAS STATE UNIVERSITY | Department of Agricultural Economics