



US and NC Agricultural Outlook

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Outline

□ World and US Agricultural Outlook

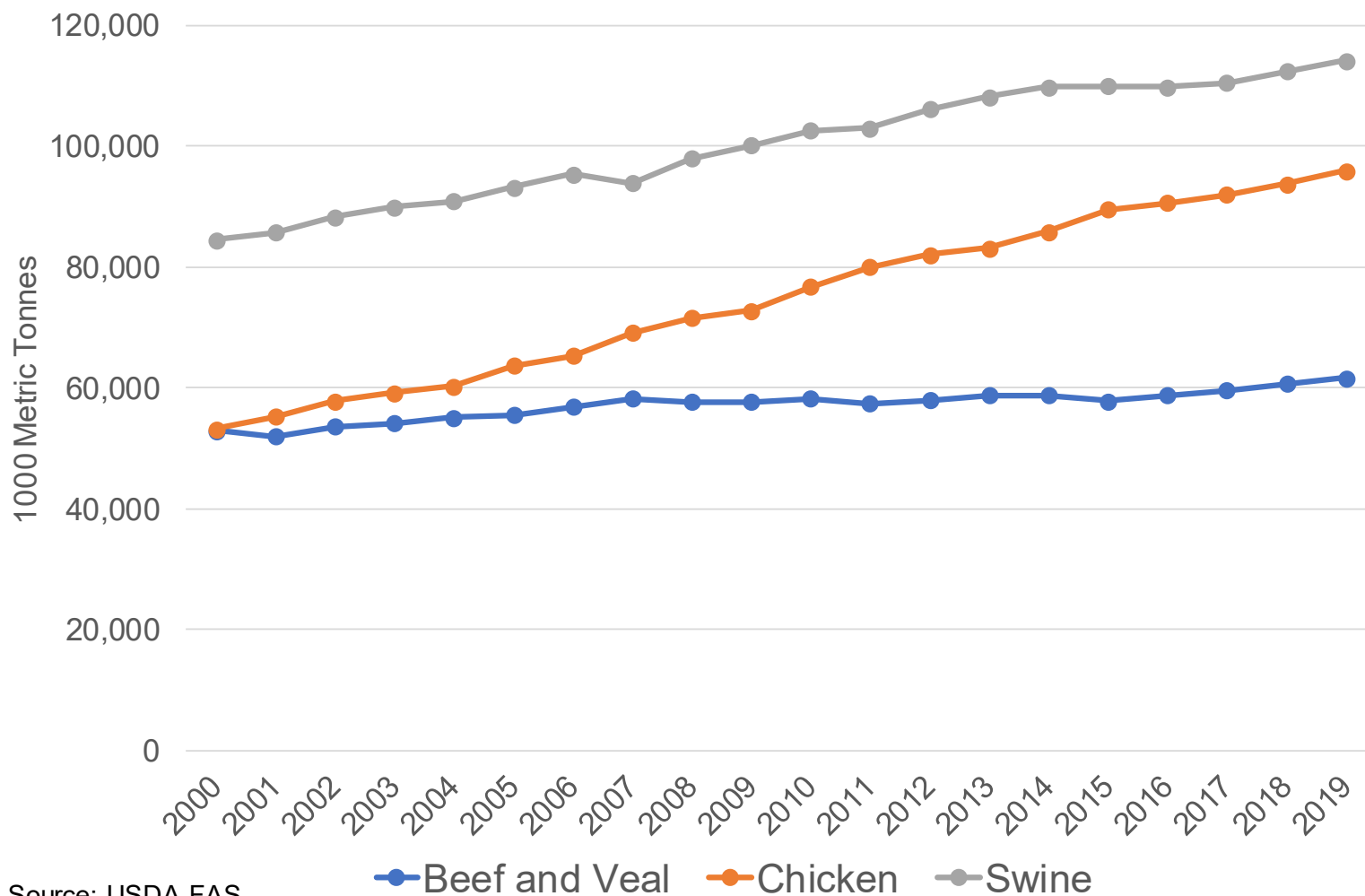
- **World demand for key agricultural products**
- **US Farm Sector Income Statement**
- **Major row crop planted acres in US**
- **Corn and soybean supply and disappearance**
- **Ending stocks impact on price volatility**

□ NC Agricultural Outlook

- **Concerns about declining feed grain acres**
- **Feed grain deficit accentuated in 2018**
- **Increases in NC corn basis**
- **Potential need for investment in NC logistics infrastructure**
- **Vulnerabilities for agriculture experienced during Florence**

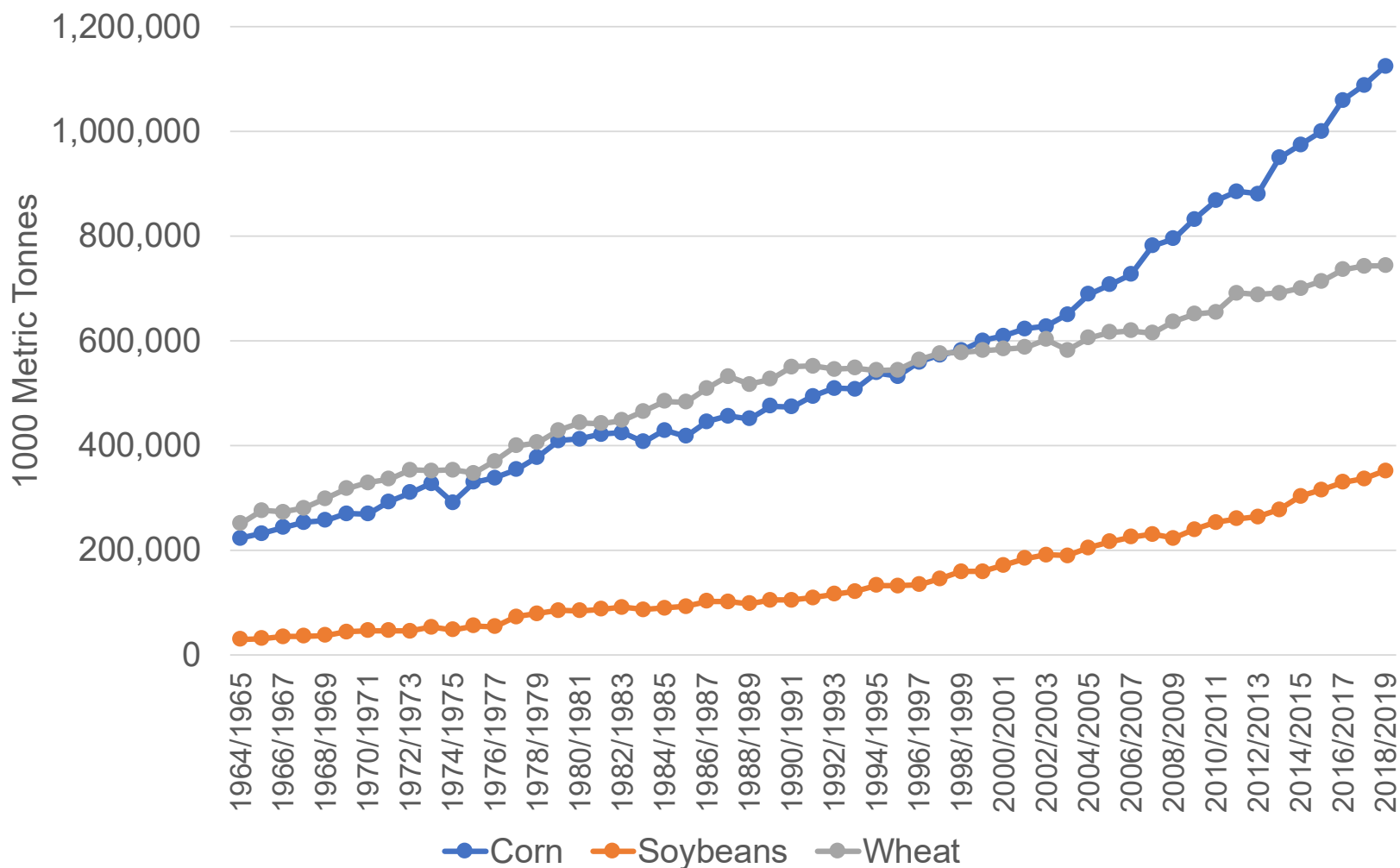


World Consumption of Beef and Veal, Chicken, and Swine 2000-2018





World Consumption of Corn, Soybeans, and Wheat 1964/65-2018/19F





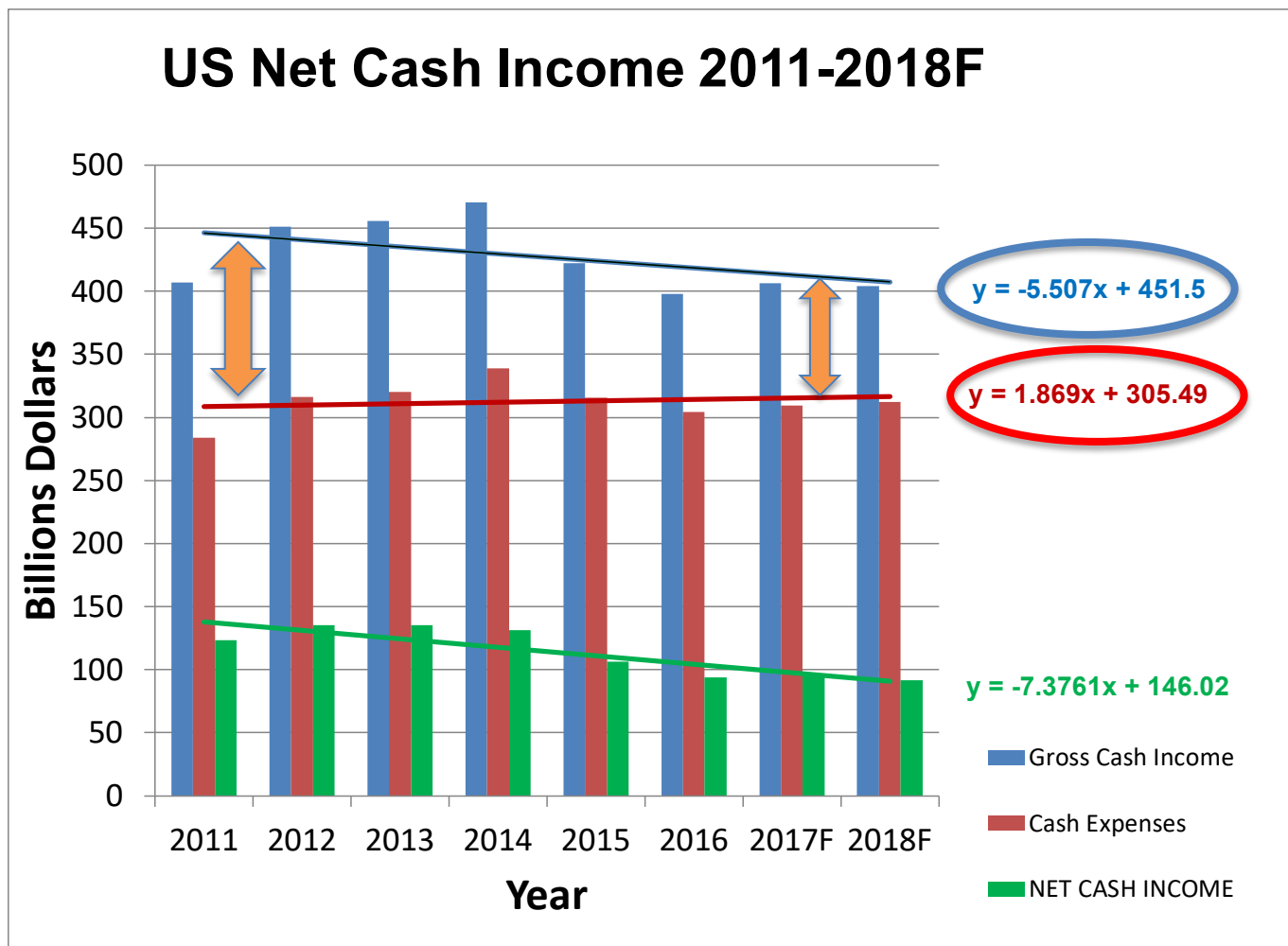
2018F US agricultural economy setting new lower levels from historical highs

Income Statement U.S. Farm Sector 2011-2018F

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017F | 2018F | 2018F v. 2017F | 2018F v. 2013 |
|------------------------|--------------|--------------|--------------|--------------|--------------|-------------|--------------|-------------|----------------------|---------------------|
| | \$ billion | | | | | | | | | |
| Cash Receipts | 365.9 | 401.4 | 403.6 | 424.2 | 377.1 | 357.9 | 374.3 | 374.0 | -0.1% | -7.3% |
| Crops | 201.0 | 231.6 | 220.8 | 211.4 | 187.6 | 195.0 | 198.3 | 197.6 | -0.3% | -10.4% |
| Livestock | 164.9 | 169.8 | 182.7 | 212.8 | 189.5 | 162.8 | 176.0 | 176.2 | 0.1% | -3.5% |
| Direct Govt. Pay | 10.4 | 10.6 | 11.0 | 9.8 | 10.8 | 13.0 | 11.5 | 9.5 | -17.4% | -13.5% |
| Farm-related income | 30.8 | 39.3 | 41.0 | 36.6 | 34.4 | 27.9 | 32.9 | 34.7 | 5.6% | -15.3% |
| Gross Cash Income | 407.1 | 451.3 | 455.5 | 470.6 | 422.3 | 398.7 | 418.7 | 418.2 | -0.1% | -8.2% |
| Cash Expenses | 283.9 | 316.1 | 320.0 | 339.0 | 315.9 | 303.8 | 314.8 | 326.7 | 3.8% | 2.1% |
| NET CASH INCOME | 123.2 | 135.3 | 135.6 | 131.6 | 106.3 | 94.9 | 104.0 | 91.5 | -12.0% | -32.5% |
| Selected ratios: | Percent | | | | | | | | | |
| Debt-to-equity | 14.5 | 12.7 | 12.8 | 13.3 | 14.0 | 14.5 | 15.1 | 15.5 | 2.7% | 21.1% |
| Debt-to-asset | 12.7 | 11.3 | 11.4 | 11.7 | 12.3 | 12.7 | 13.1 | 13.4 | 2.3% | 18.3% |

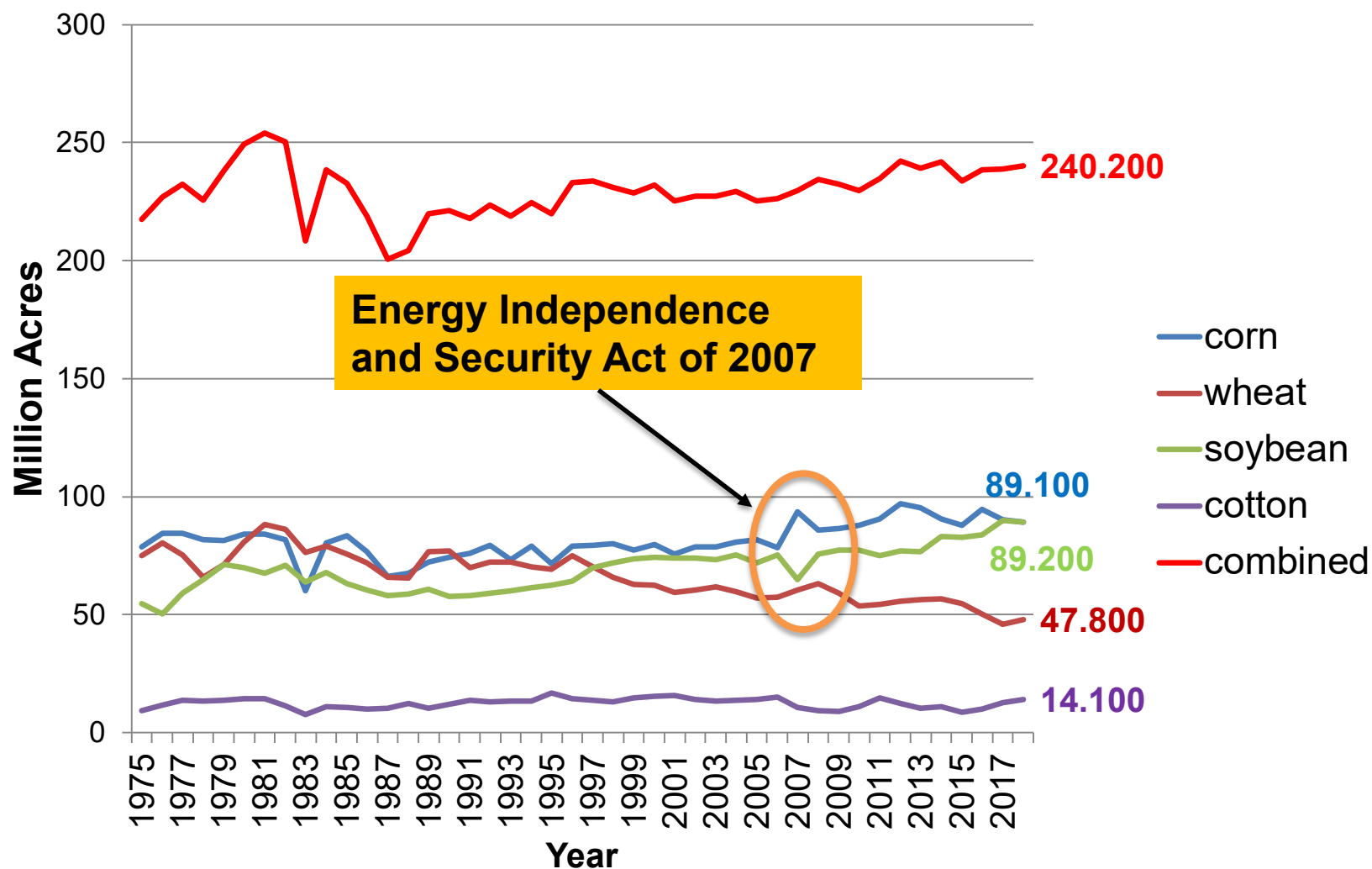


US agriculture experiencing a cost-price squeeze— increasing costs and simultaneously decreasing prices



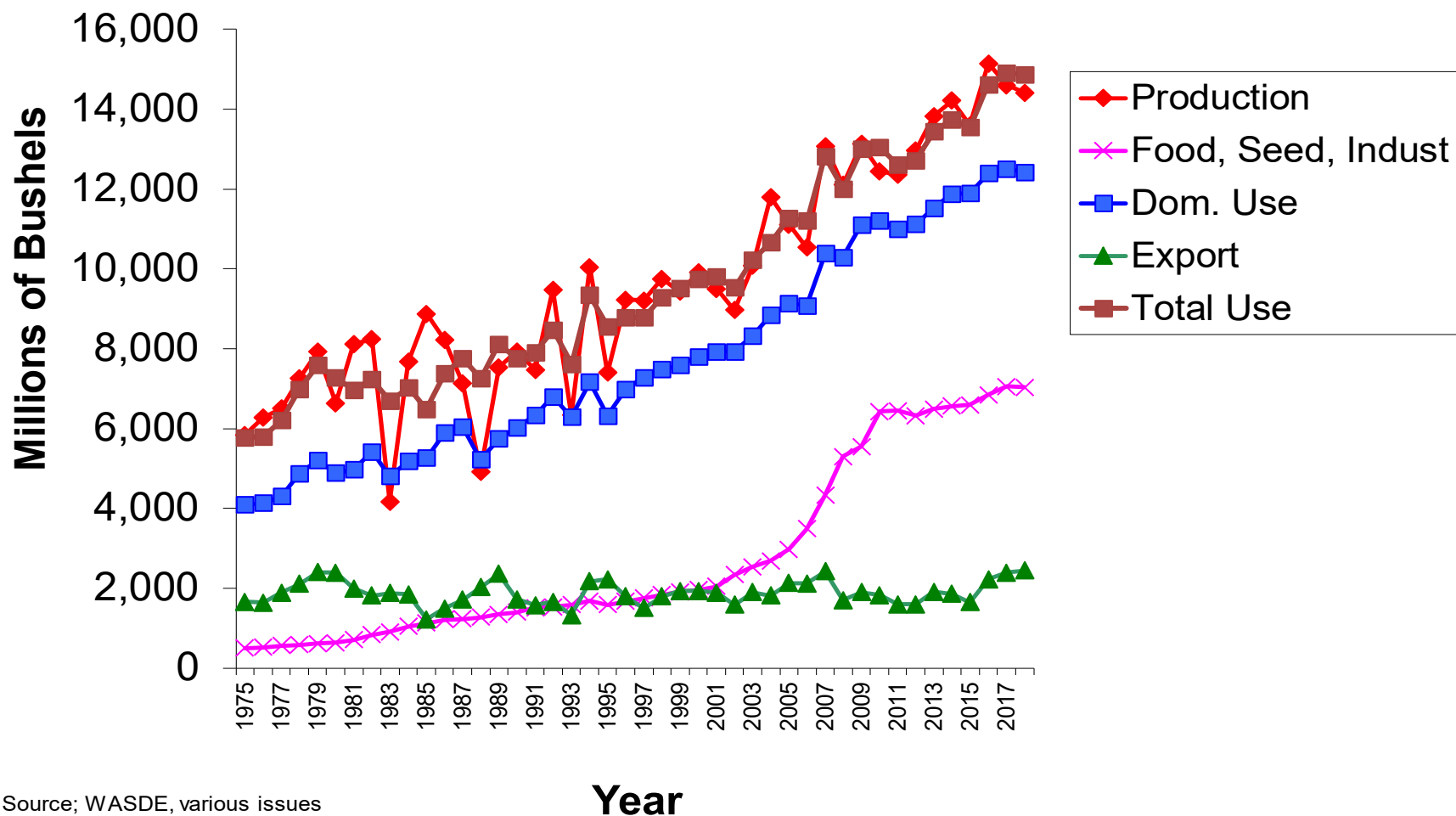


US Major Corn, Soybean, Wheat, and Cotton Acreage 1975-2018F





U.S. Corn Supply and Disappearance 1975/76-2018/19F



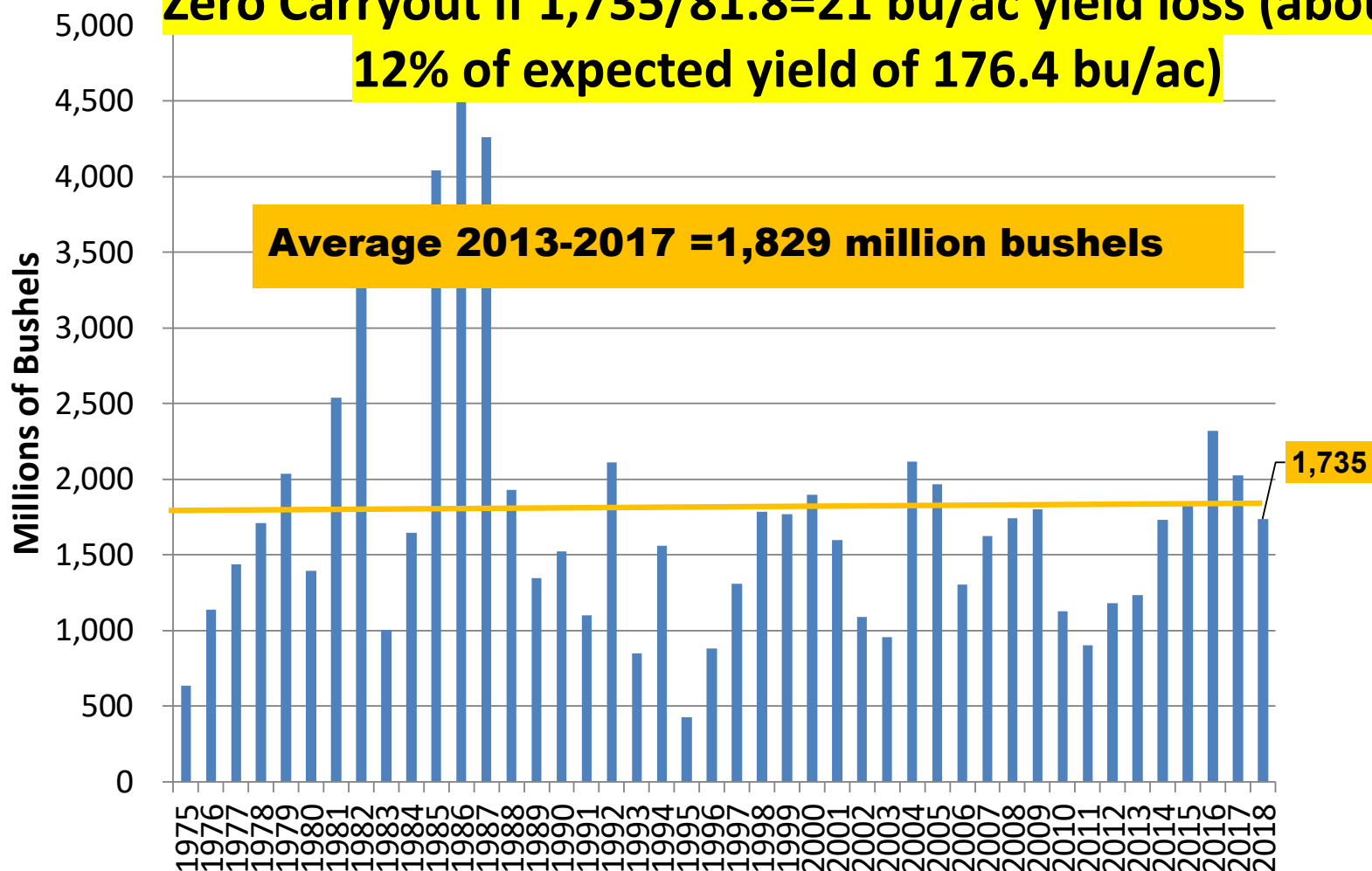
Source; WASDE, various issues



US Corn Ending Stocks 1975/76-2018/19F

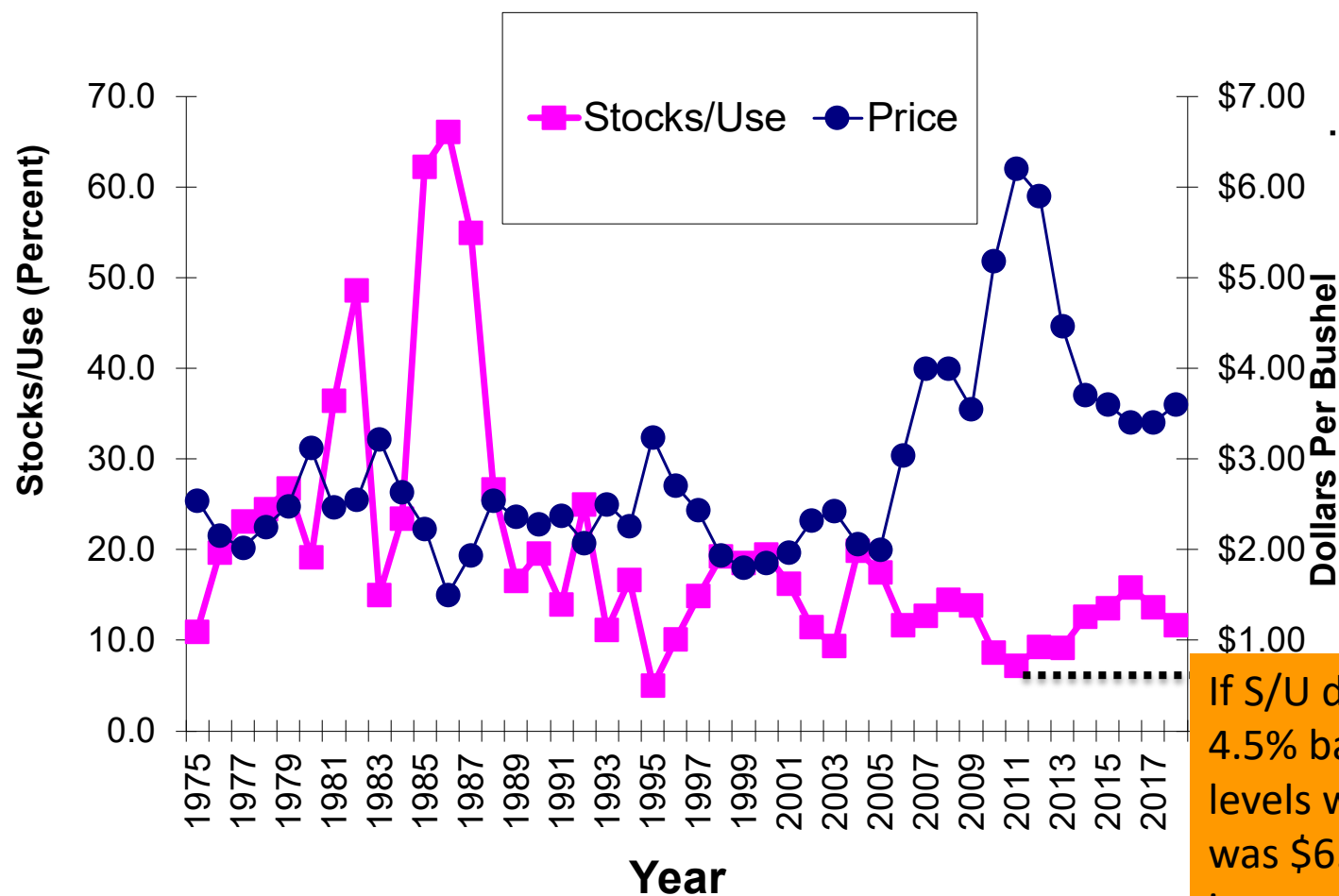
Zero Carryout if $1,735/81.8=21$ bu/ac yield loss (about 12% of expected yield of 176.4 bu/ac)

Average 2013-2017 = 1,829 million bushels





US Corn Stocks/Use and Average Farm Price 1975/76-2018/19F

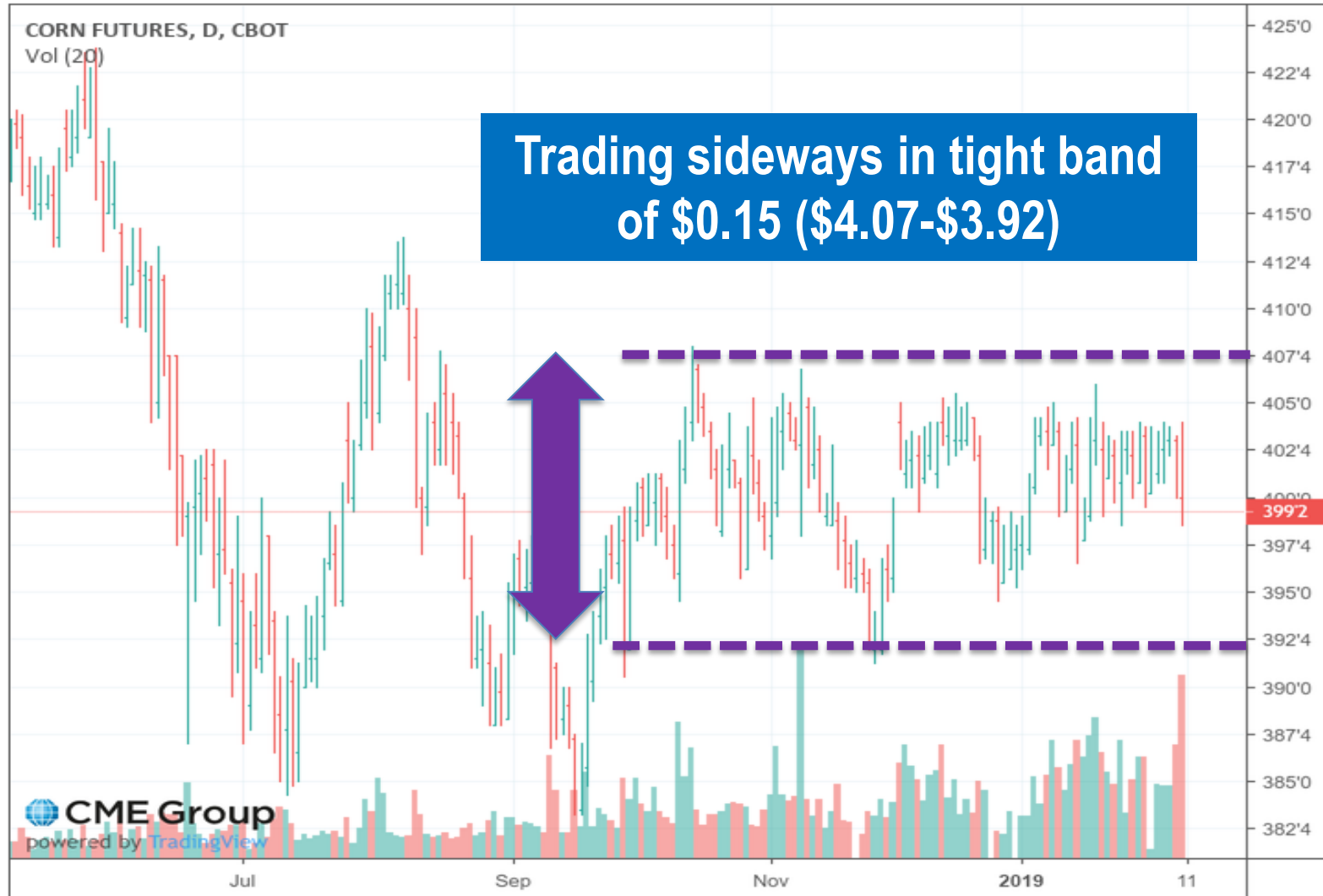


If S/U declines by 4.5% back to 2011 levels where price was \$6.20—an increase of \$2.60



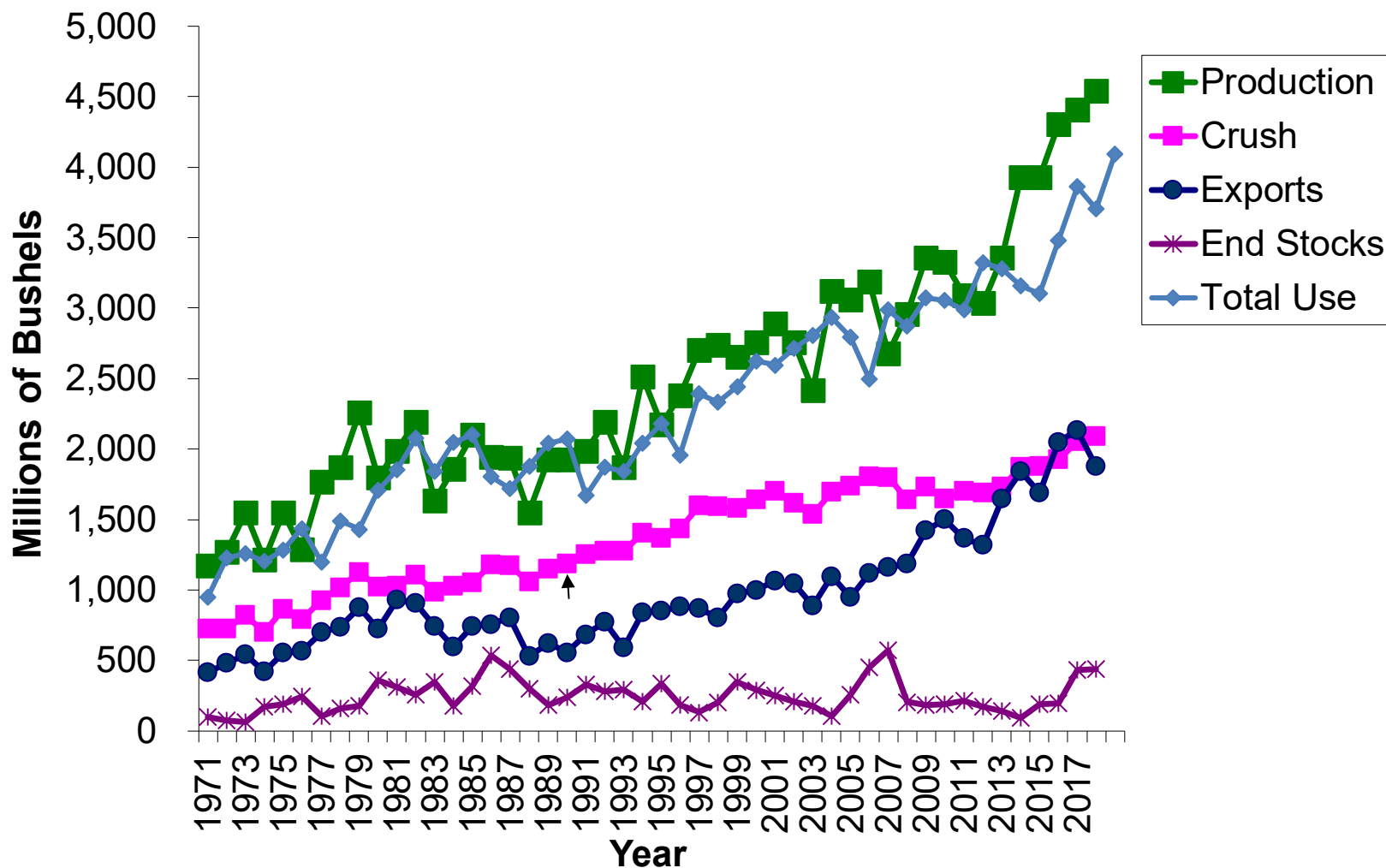
Corn Futures C-Dec19

CBOT:ZCZ2019, D 399'2 ▼ -1'0 (-0.25%) O:400'0 H:404'0 L:398'4 C:399'2



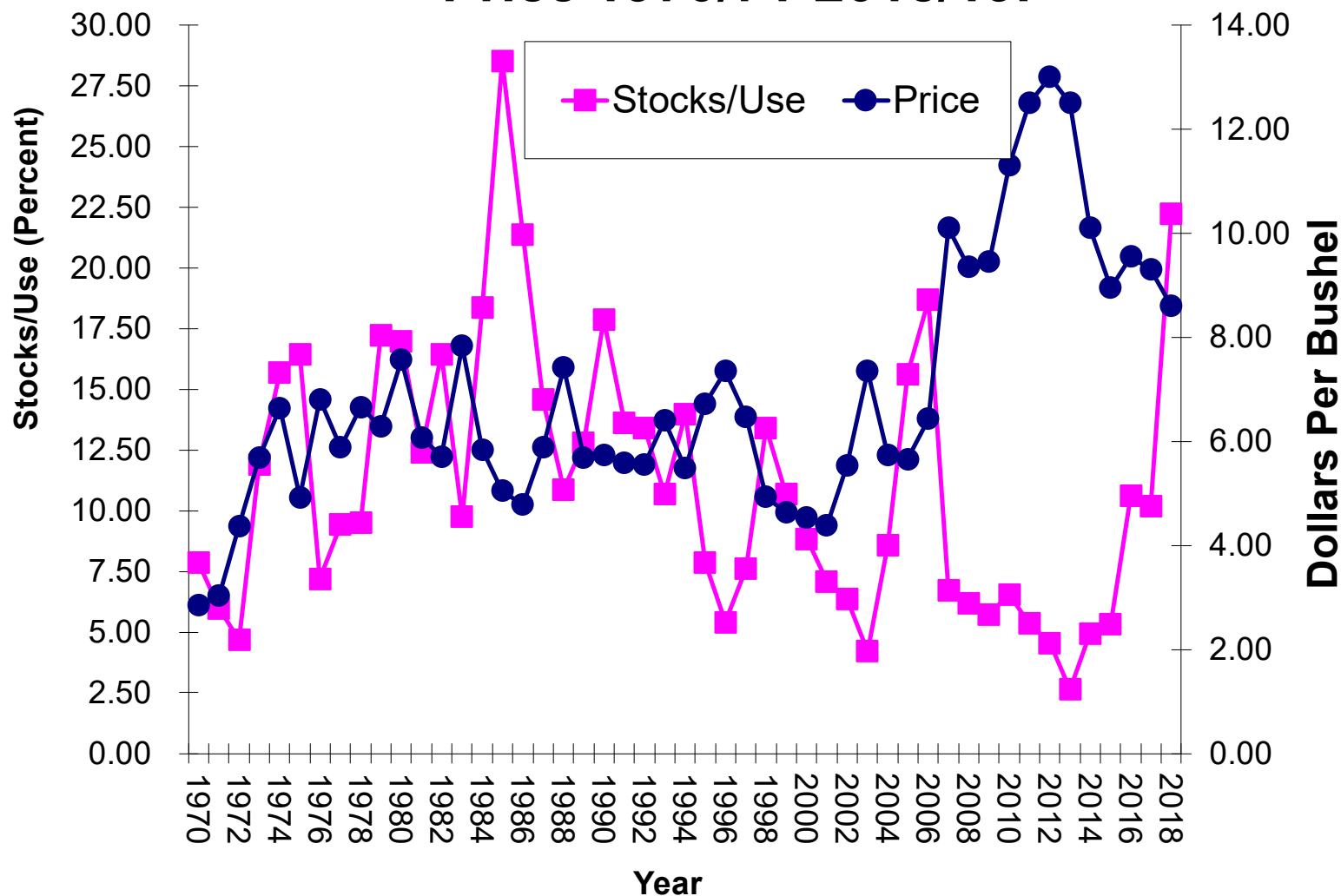


US Soybean Supply and Disappearance 1971/72-2018/19F





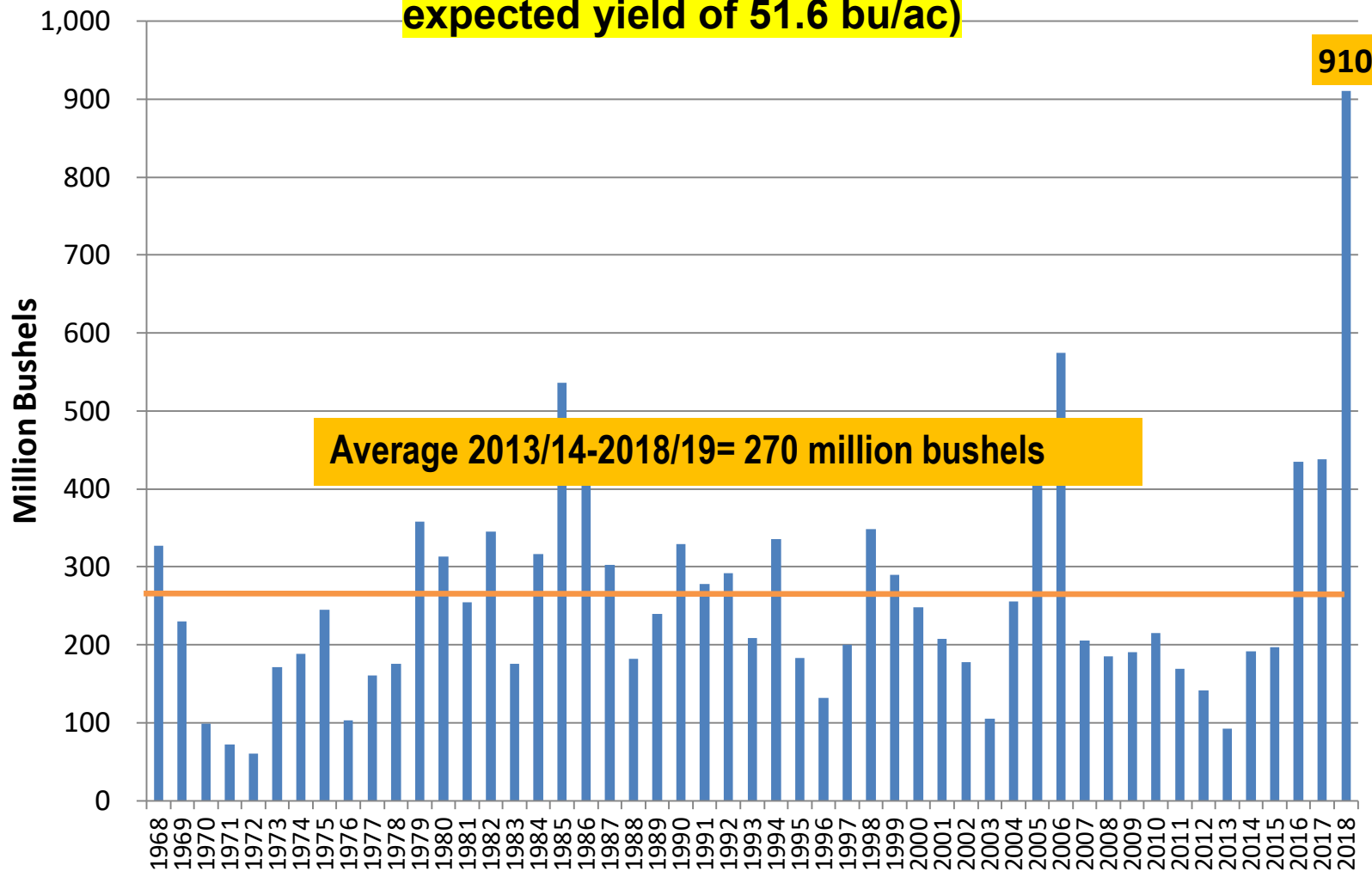
US Soybean Stocks/Use and Average Farm Price 1970/71-2018/19F





US Soybeans Ending Stocks 1968/69-2018/19F

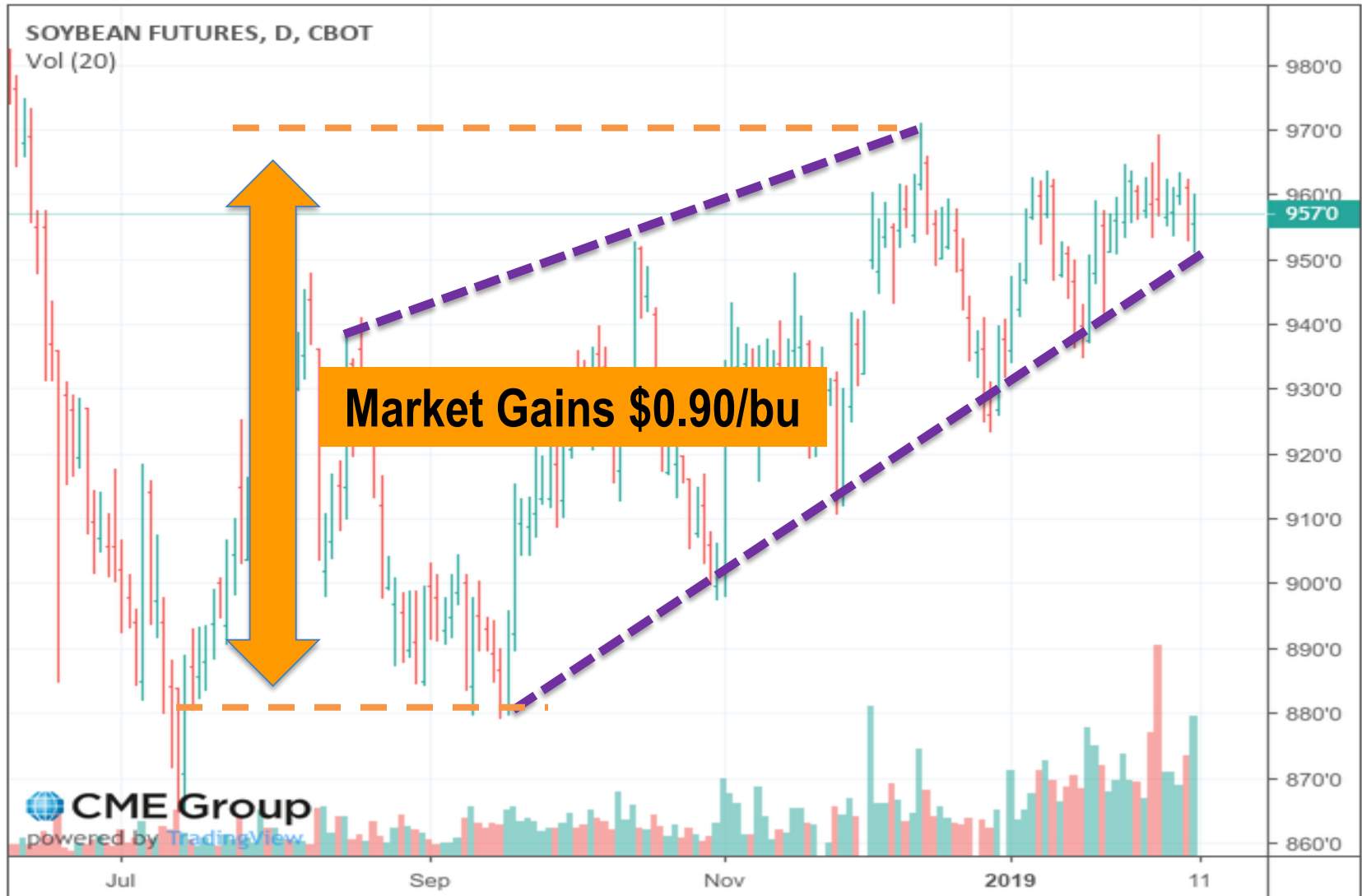
Zero Carryout if $910/88.1=10$ bu/ac yield loss (about 20% of expected yield of 51.6 bu/ac)





Soybean Futures S-Nov19

CBOT:ZSX2019, D 957'0 ▲ +1'2 (+0.13%) O:955'4 H:960'0 L:951'2 C:957'0





Corn and Soybean Prices 2008-2018

Maize (corn) Monthly Price - US Dollars per Metric Ton

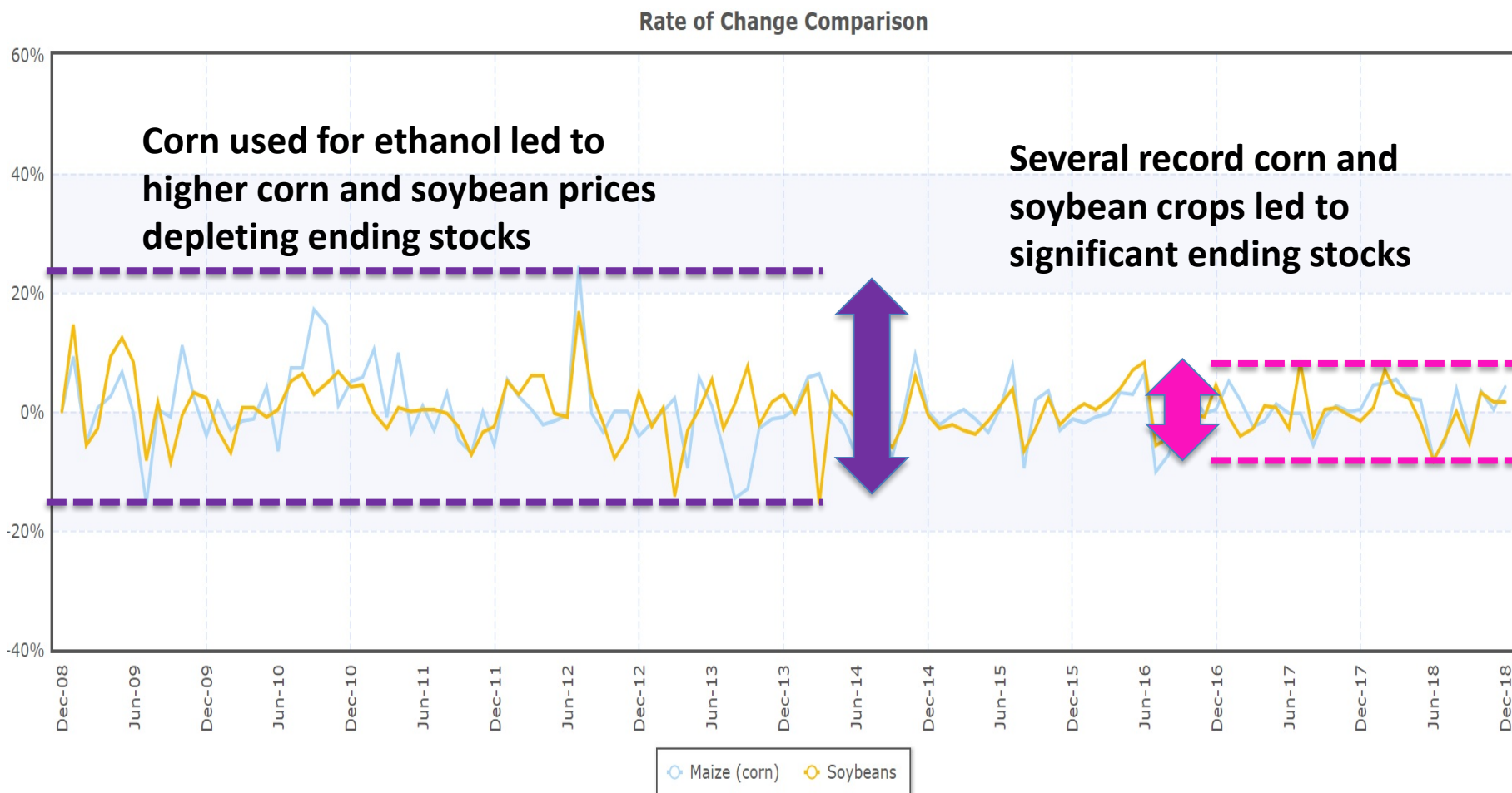


Soybeans Monthly Price - US Dollars per Metric Ton





Ending Stocks and Price Volatility





NC Major Row Crop Acreage: 2008-2018

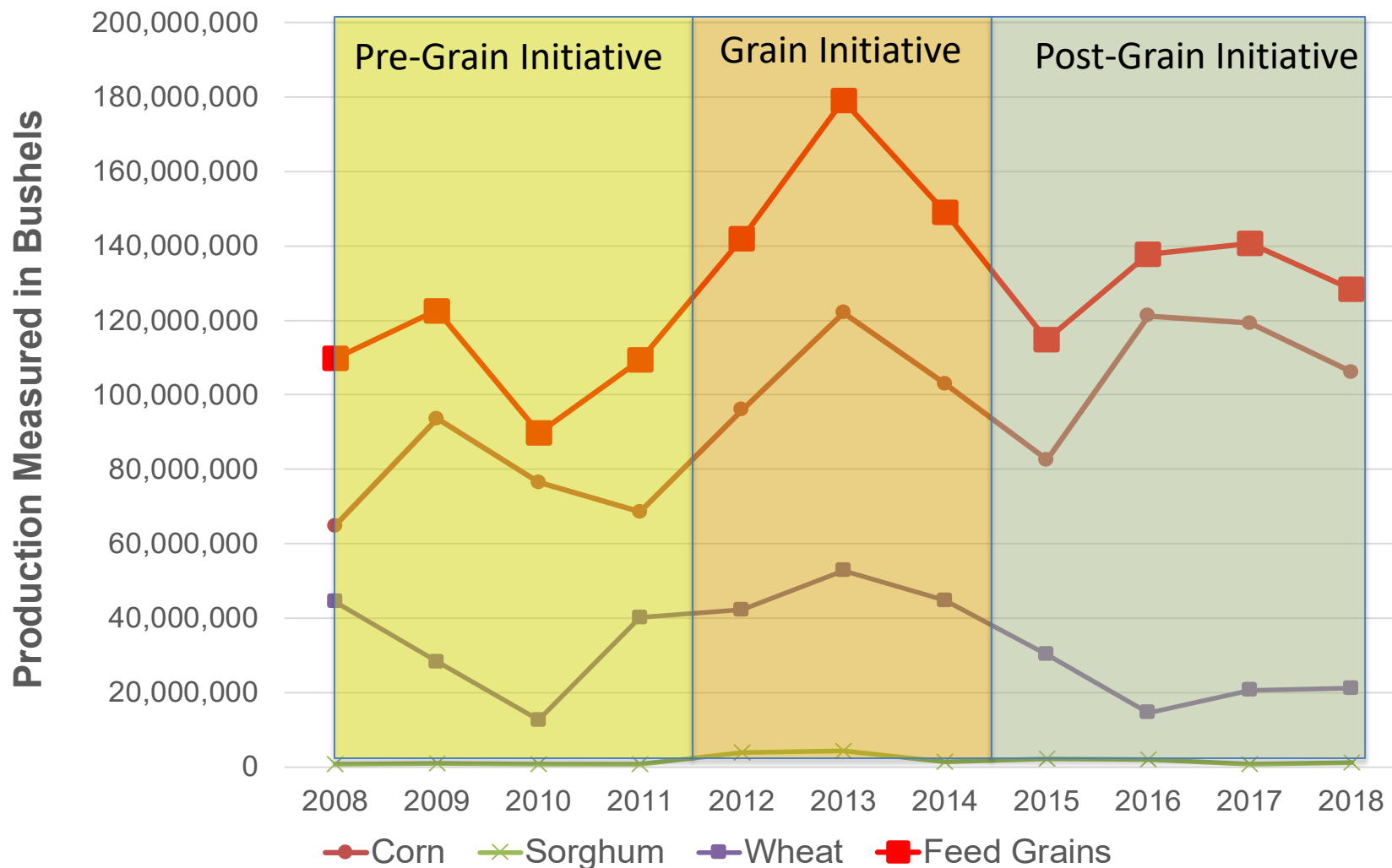
- ❑ Past 11 years reveals, over the pre- and post-feed grain initiative, a decline in total acres of **10.7%**, with a decline in feed grain acres (**21%**).
- ❑ Corn acres have slightly increased **1.1%**
- ❑ Wheat acreage has declined by **45.9%** but this masks a significant run-up between 2010 and 2013 when wheat acres more than doubled but then significantly steadily declined
- ❑ Sorghum acres peaked during feed grain initiative then declined

| | NC Acres Planted 2008-2018 | | | | | | | | | | | | |
|-----------------------------------|----------------------------|-----------|---------------------------|-----------|-----------|-----------|------------------------------|-----------|-----------|-----------|-----------|--------------|--|
| Crop | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2008 vs 2018 | |
| CORN ^a | 900,000 | 870,000 | 910,000 | 870,000 | 870,000 | 930,000 | 840,000 | 790,000 | 1,000,000 | 890,000 | 910,000 | 1.1% | |
| WHEAT ^a | 850,000 | 660,000 | 430,000 | 670,000 | 810,000 | 990,000 | 830,000 | 650,000 | 420,000 | 450,000 | 460,000 | -45.9% | |
| SORGHUM ^b | 16,000 | 16,159 | 13,262 | 14,936 | 70,366 | 79,187 | 26,640 | 39,516 | 45,000 | 20,000 | 20,000 | 25.0% | |
| COTTON ^a | 430,000 | 375,000 | 550,000 | 805,000 | 585,000 | 465,000 | 465,000 | 385,000 | 280,000 | 375,000 | 430,000 | 0.0% | |
| SOYBEANS ^a | 1,690,000 | 1,800,000 | 1,580,000 | 1,380,000 | 1,590,000 | 1,480,000 | 1,750,000 | 1,820,000 | 1,690,000 | 1,700,000 | 1,650,000 | -2.4% | |
| Total | 3,886,000 | 3,721,159 | 3,483,262 | 3,739,936 | 3,925,366 | 3,944,187 | 3,911,640 | 3,684,516 | 3,435,000 | 3,435,000 | 3,470,000 | -10.7% | |
| Feed Grains | 1,766,000 | 1,546,159 | 1,353,262 | 1,554,936 | 1,750,366 | 1,999,187 | 1,696,640 | 1,479,516 | 1,465,000 | 1,360,000 | 1,390,000 | -21.3% | |
| % Feed Grains | 45.4% | 41.6% | 38.9% | 41.6% | 44.6% | 50.7% | 43.4% | 40.2% | 42.6% | 39.6% | 40.1% | -11.9% | |
| | | | Pre-Feed Grain Initiative | | | | During Feed Grain Initiative | | | | | | |
| Source: a=Nass, USDA, b=FSA, USDA | | | | | | | | | | | | | |

Source: a=Nass, USDA, b=FSA, USDA



NC Feed Grain Crop Production 2008-2017





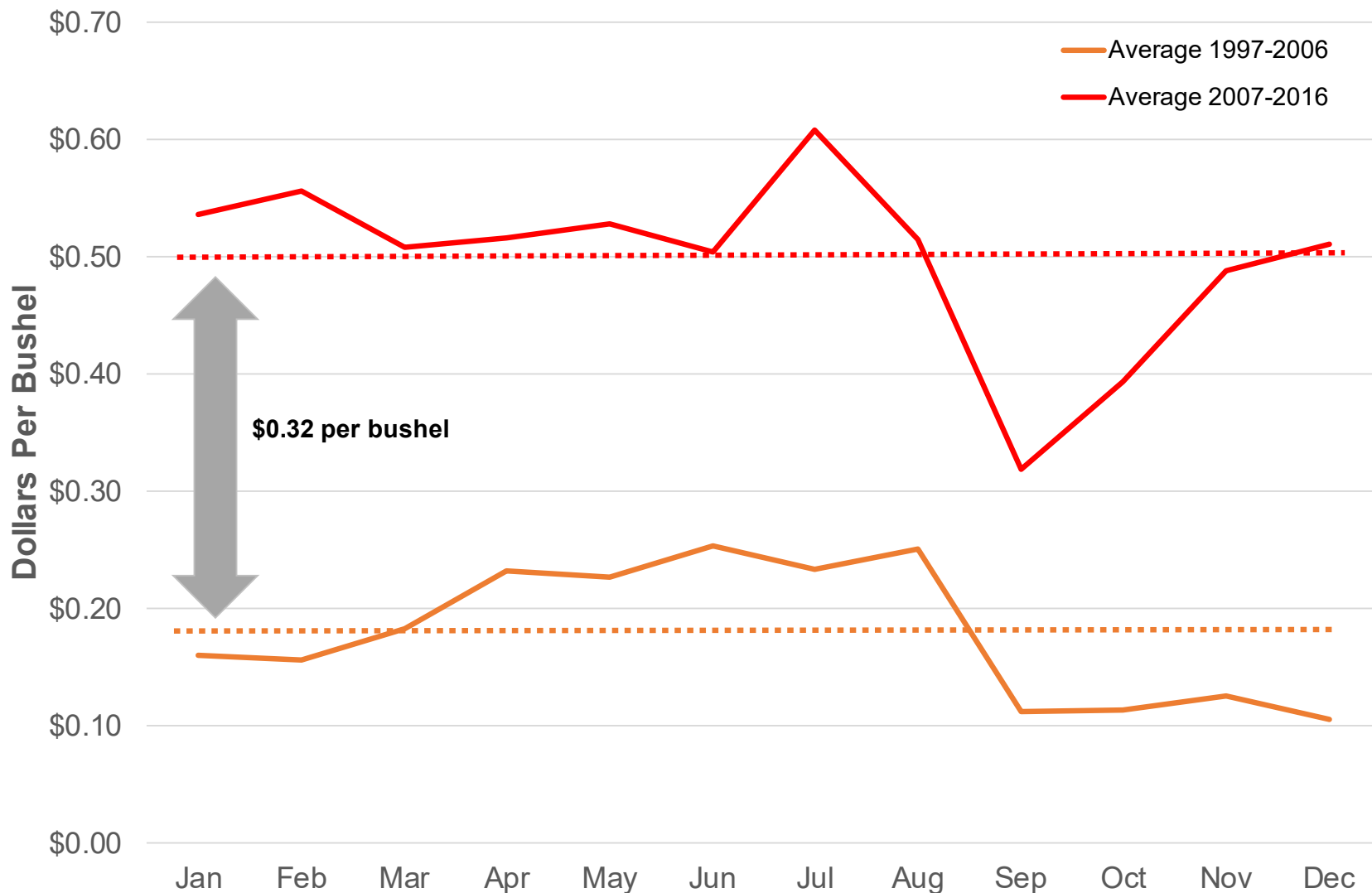
NC Feed Grain Deficit Averages Around 50%, But Higher in 2018

| Feed Grain/Livestock | Acres (5 yr. aver. 2012-16) | Yield | Lbs per Bushel | Production (5yr average 2012-2016) | 2018 |
|---------------------------|--------------------------------|-------------------------|------------------|---------------------------------------|--------------|
| | | <i>Bushel/Acre</i> | | <i>Million Bushels</i> | |
| Corn | 886,000 | 126.6 | 56 | 112.2 | 98.3 |
| Wheat (80% fed) | 740,000 | 53.2 | 60 | 39.4 | 21.1 |
| Sorghum | 52,142 | 55.0 | 56 | 2.9 | 2.9 |
| Total | | | | 154.4 | 122.2 |
| | GCAU FACTOR | 2017 Annual Head | 2017 GCAU | Feed Demand | |
| Hogs | 0.2285 | 9,000,000 | 2,056,500 | 171.6 | |
| Broilers | 0.0020 | 125,953,846 | 251,908 | 21.0 | |
| Layers | 0.0217 | 15,143,000 | 328,603 | 27.4 | |
| Turkeys | 0.0155 | 10,307,692 | 159,769 | 13.3 | |
| Cattle | 1.1055 | 830,000 | 917,533 | 76.6 | |
| Total | | | 3,714,313 | 310.0 | 310.0 |
| Feed Grain Deficit | | | | 155.6 | 187.8 |

Note: 1 GCAU=2.12 Metric tonnes (or 4,673.8 lbs) in 2017 (dry-weight quantity of feed consumed by an average milk cow); 1 bushel is 56 pounds



Figure 1: Difference in Monthly Average Nearby Basis at Rose Hill, North Carolina for the Periods 1997-2006 and 2007-2016





Inherent Geographical Advantage— Demand and Supply Side

❑ LOCATION-LOCATION-LOCATION

- NC agriculture has two substantial advantages over most other agricultural producing states:
 1. NC is less than a day's drive to most of the densely populated areas of the US—North East corridor which demands a lot of food with limited ability to produce
 2. NC has a coast and therefore a direct window to the increasing demand for food and commodities in the international economy via the Atlantic Ocean but our ports are largely under utilized for agriculture. Potential to be a major supplier of the world's protein.





NC Ports' Strategic Location

Market Accessibility

Within 700 miles/1,110 km
of North Carolina's
Borders Are:

- ❖ 170 million U.S. and Canadian consumers
- ❖ 65 of the country's top 100 metropolitan areas
- ❖ 58.2% of total U.S. retail sales
- ❖ Central East Coast location



Source: Robert Hosford, International Marketing Division NCDA&CS



Investment in NC Logistics Infrastructure

- ☐ If the costs of transporting out-of-state sources continues to rise, it will only further increase the costs of corn the most important input to the livestock industry.
- ☐ To preserve the vitality of the NC agricultural economy, it would be prudent to consider further investments into the logistical infrastructure that will address current inefficiencies and potentially lower the costs of importing feedstuffs from out-of-state.
- ☐ Investing in improved railways and ports will not only be beneficial to the NC livestock industry, there will be significant positive spillovers to other industries that are dependent on transportation into and out of NC, so it should help to improve the overall economy in NC.
- ☐ In the interim we can expect continued strong and further strengthening in corn basis which will benefit NC feed grain producers. Continued high or even higher corn basis may, in turn, encourage greater corn production in NC which, in turn, could temper future corn deficiencies.

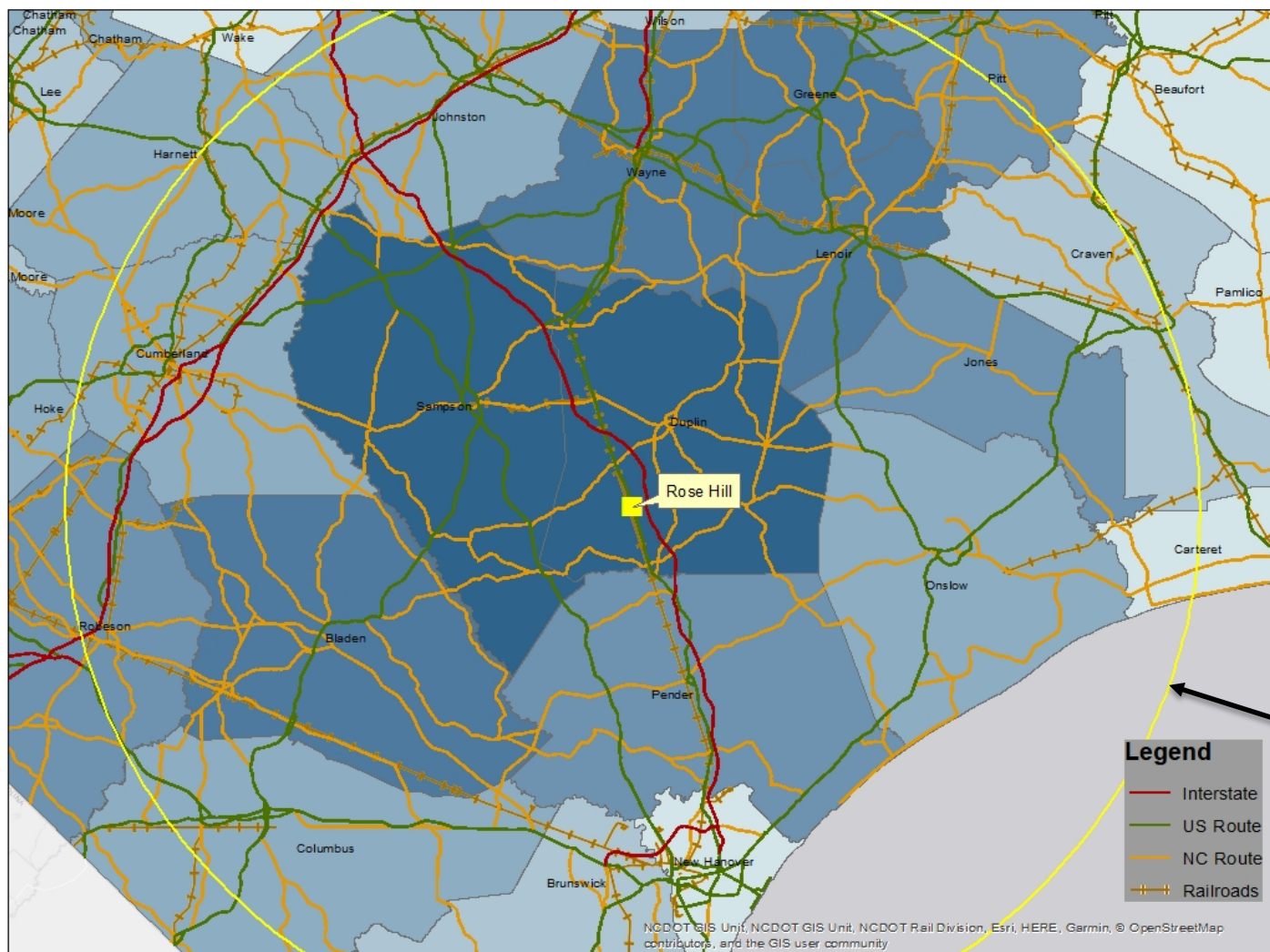


Vulnerabilities for Agriculture Experienced from Florence

- ❑ **NC is vulnerable to severe weather during hurricane season which can lead to extensive crop damage and extreme flooding.**
- ❑ **Agriculture is particularly vulnerable in two ways:**
 1. **Row crop production occurs during hurricane season making for additional production risk. Corn and soybean crop losses and impacted planted wheat acres can accentuate the feed grain deficit.**
 2. **Animal agriculture is threatened; animals drown, interruptions of feed and veterinary supply deliveries, and negative impact on marketings**
- ❑ **Adaptions worthy of consideration for emergency response**
 - **Strategic input supplies pre-positioned? Where? How much?**
 - **Investment and/or co-ordination in logistical infrastructure (capital and modes of distribution) which facilitates continuity of critical input deliveries and orderly marketing of outputs**



Livestock Feed Demand and Infrastructure



**60 mile
radius
around
Rose Hill**

Source: Heidi Schweizer, ARE-NCSU



Final Thoughts

- ❑ **World demand for key agricultural products is *strong* as a result of rising incomes and populations**
- ❑ **US Farm Sector Income Statement**
 - ❑ **reveals significant downturn and cost price squeeze**
- ❑ **Consecutive record US corn and soybean crops have resulted in significantly larger ending stocks**
 - ❑ **Lower prices but less price volatility**
- ❑ **Declining feed grain acreage is a concern for the vitality of the NC livestock industry**
- ❑ **Row crop farmers will respond with additional acres with price incentives which will require improved basis offers**
- ❑ ***More analysis needed***
 - **Further investments into logistical infrastructure will potentially lower the costs of importing corn from out-of-state.**
 - **Potential capital investment in logistical infrastructure to increase resiliency in the agricultural supply chain during extreme weather events.**