



# Update on North Carolina Feed Grain Deficit

***Nick Piggott***

***Dept of Agricultural & Resource  
Economics***

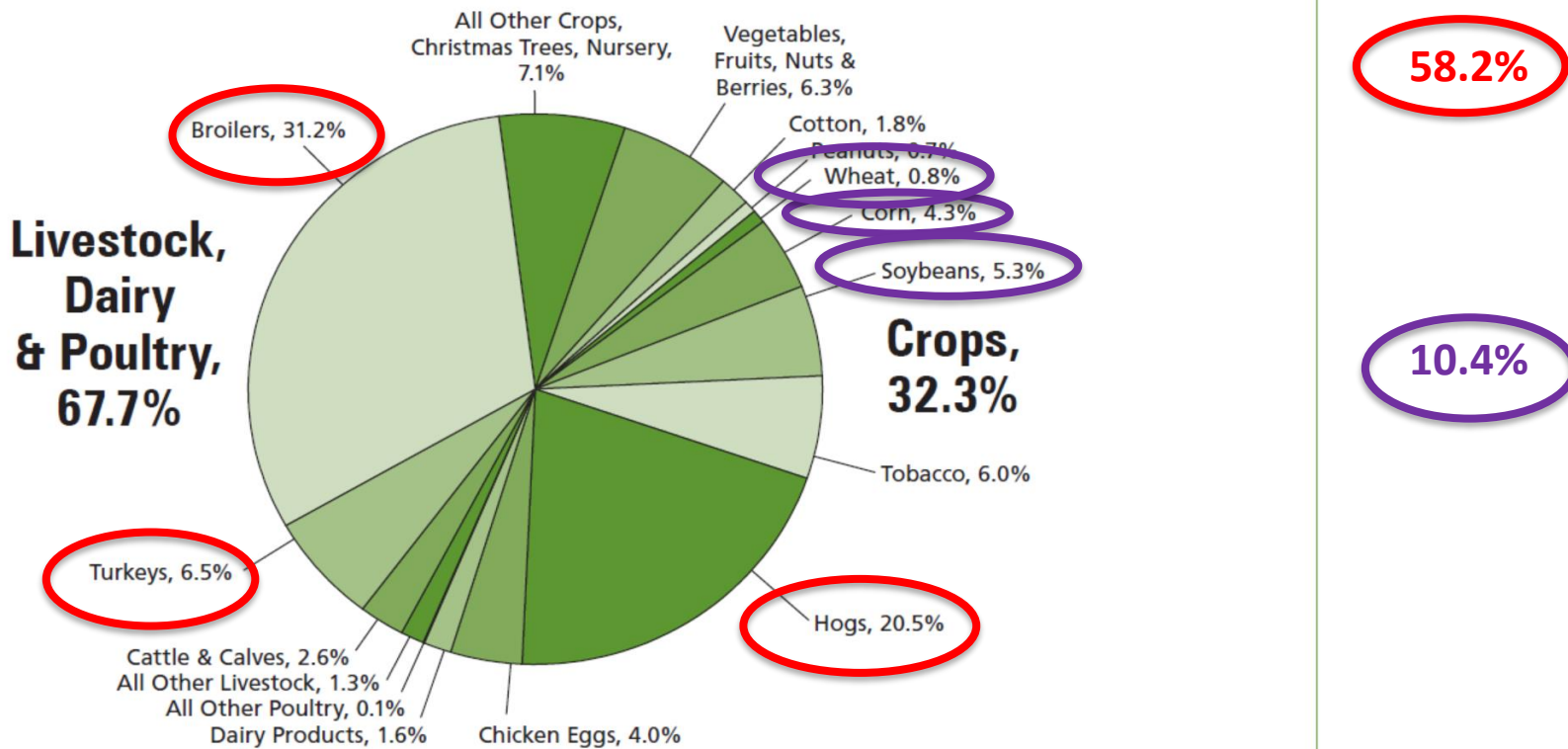
***North Carolina State University***

*NC Animal Agriculture - Economic Update  
NC Cooperative Extension State Conference  
October 29, 2019  
Raleigh, NC*



# SOURCE OF FARM CASH RECEIPTS, NORTH CAROLINA, 2017

\$11,432,976,000



58.2%

10.4%

<sup>1</sup> All Other Crops includes hay, greenhouse, floriculture, nursery, cut Christmas trees, mushrooms and other miscellaneous crops.



# NC Feed Grain Deficit Averages Around 53%, But Higher in 2018 and 2019

Feed Grain/Livestock	Acres (5 yr. aver. 2013-17)	Yield <i>Bushel/Acre</i>	Lbs per Bushel	Production (5yr average 2013-2017) <i>Million Bushels</i>	Production 2018	Production 2019
Corn	890,000	131.6	56	109.6	93.8	100.1
Wheat (80% fed)	668,000	52.8	60	34.2	21.1	12.6
Sorghum	22,271	55.0	56	1.5	0.5	--
<b>Total</b>				<b>145.3</b>	<b>115.4</b>	<b>112.7</b>
	<b>GCAU FACTOR</b>	<b>2017 Annual Head</b>	<b>2017 GCAU</b>	<b>Feed Demand in Bushels</b>		
Hogs	0.2285	9,000,000	<b>2,056,500</b>	171.6		
Broilers	0.0020	125,953,846	<b>251,908</b>	21.0		
Layers	0.0217	15,143,000	<b>328,603</b>	27.4		
Turkeys	0.0155	10,307,692	<b>159,769</b>	13.3		
Cattle	0.0000	830,000	<b>917,533</b>	76.6		
<b>Total</b>			<b>3,714,313</b>	<b>310.0</b>	<b>310.0</b>	<b>310.0</b>
<b>Feed Grain Deficit</b>				<b>164.7</b>	<b>194.6</b>	<b>197.3</b>
				<b>53%</b>	<b>63%</b>	<b>64%</b>

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



# Top 10 North Carolina Counties by Feed Needs

NC Average Livestock Head During the Year Daily	<b>161.2</b> million head
NC Average Livestock Weight During the Year	<b>2.722</b> billion lbs
NC Daily Feed Needs During the Year	<b>21,574</b> metric tons
NC Daily Feed Needs During the Year	<b>47.561</b> million lbs
NC Daily Feed Needs During the Year (corn bu equiv)	<b>0.849</b> million bushels

County	Estimated Grain Consuming Animal Units	Metric Tons of Energy Feeds Needed	Metric Tons All Feeds Needed	Truckloads All Feeds Needed <sup>a</sup>	Railcars All Feeds Needed <sup>b</sup>	Ships All Feeds Needed <sup>c</sup>
		Annual	Annual	Weekly	Weekly	4 Weeks
Duplin	537,824	817,493	1,140,187	1,007	241.7	1.67
Sampson	523,945	796,396	1,110,763	981	235.5	1.63
Bladen	181,201	275,425	384,146	339	81.4	0.56
Wayne	153,375	233,131	325,156	287	68.9	0.48
Robeson	105,321	160,088	223,281	197	47.3	0.33
Greene	89,171	135,540	189,043	167	40.1	0.28
Union	87,805	133,463	186,146	164	39.5	0.27
Iredell	80,260	121,995	170,151	150	36.1	0.25
Randolph	78,534	119,371	166,491	147	35.3	0.24
Lenoir	76,246	115,893	161,641	143	34.3	0.24

## Notes

- a. Assumed trailer length is 36"
- b. Car capacity assumed to be 4750cf
- c. Assumed vessel size is Panamax



# Corn and Soybean Prices 2008-2018

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

Range 6m 1y 5y 10y 15y 20y 25y 30y

Dec 2008 - Dec 2018: 9.180 (5.80 %)



Soybeans Monthly Price - US Dollars per Metric Ton

Range 6m 1y 5y 10y 15y 20y 25y 30y

Dec 2008 - Dec 2018: 20.530 (5.70 %)





# 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

Crop	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2008 vs 2018
<b>CORN<sup>a</sup></b>	1,090,000	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%
<b>WHEAT<sup>a</sup></b>	630,000	850,000	660,000	430,000	670,000	810,000	990,000	830,000	650,000	420,000	450,000	460,000	-45.9%
<b>SORGHUM<sup>b</sup></b>	12,000	16,000	16,159	13,262	14,936	70,366	79,187	26,640	39,516	45,000	20,000	20,000	25.0%
<b>COTTON<sup>a</sup></b>	500,000	430,000	375,000	550,000	805,000	585,000	465,000	465,000	385,000	280,000	375,000	430,000	0.0%
<b>SOYBEANS<sup>a</sup></b>	1,440,000	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%
<b>Total</b>	3,672,000	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%
<b>Feed Grains</b>	1,732,000	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%
<b>% Feed Grains</b>	47.2%	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						



# Current Average Profitability of NC Row Crops 2019 Planting Period: Owned Land

Budget Comparison 2019 Crop Year of Crop Choices Given Current Market Conditions and Expected Yields					
Enter Average Land Rent Value Here	0				
	Corn	Soybean	Wheat	Sorghum	Cotton
Yield (bu/acre) <sup>1</sup>	127	36	53	55	
Yield (lbs./acre)--Cotton	--	--	--	--	837
Yield (lbs./acre)--Cotton Seed	--	--	--	--	1,398
Price (New Crop Futures Price from CME & NYBOT 4/23/2019)	\$4.24	\$9.12	\$5.00	\$4.03	\$0.77
Cotton Seed	--	--	--	--	\$0.08
Current New Crop Basis	\$0.70	(\$0.14)	\$0.00	\$0.67	(\$0.02)
<b>EXPECTED NET PRICE (New Crop Futures + Basis)<sup>2</sup></b>	<b>\$4.94</b>	<b>\$8.98</b>	<b>\$5.00</b>	<b>\$4.69</b>	<b>\$0.75</b>
<b>Gross Revenue</b>	<b>\$625.40</b>	<b>\$326.87</b>	<b>\$264.00</b>	<b>\$258.12</b>	<b>\$739.75</b>
<b>VARIABLE EXPENSES<sup>1</sup></b>					
<b>Total Variable Costs</b>	<b>\$430.00</b>	<b>\$252.13</b>	<b>\$198.68</b>	<b>\$264.69</b>	<b>\$649.24</b>
<b>Return above Variable Costs</b>	<b>\$195.41</b>	<b>\$74.74</b>	<b>\$65.32</b>	<b>-\$6.58</b>	<b>\$90.51</b>
<b>FIXED EXPENSES</b>					
*TRACTOR/MACHINERY	\$65.70	\$82.63	\$33.31	\$80.66	\$113.16
**OVERHEAD	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
<b>Total Fixed Costs</b>	<b>\$65.70</b>	<b>\$82.63</b>	<b>\$33.31</b>	<b>\$80.66</b>	<b>\$113.16</b>
<b>Total Cost</b>	<b>\$495.70</b>	<b>\$334.76</b>	<b>\$231.99</b>	<b>\$345.35</b>	<b>\$762.40</b>
<b>NET RETURNS TO FARMER AND RISK:</b>	<b>\$129.71</b>	<b>(\$7.89)</b>	<b>\$32.01</b>	<b>(\$87.24)</b>	<b>(\$22.65)</b>
Break Even Yield	100	37	46	74	1017
Break Even Price	\$3.92	\$9.20	\$4.39	\$6.28	\$0.78
Break Even Yield % of 5 yr. aver.	79.3%	102.4%	87.9%	140.2%	121.4%



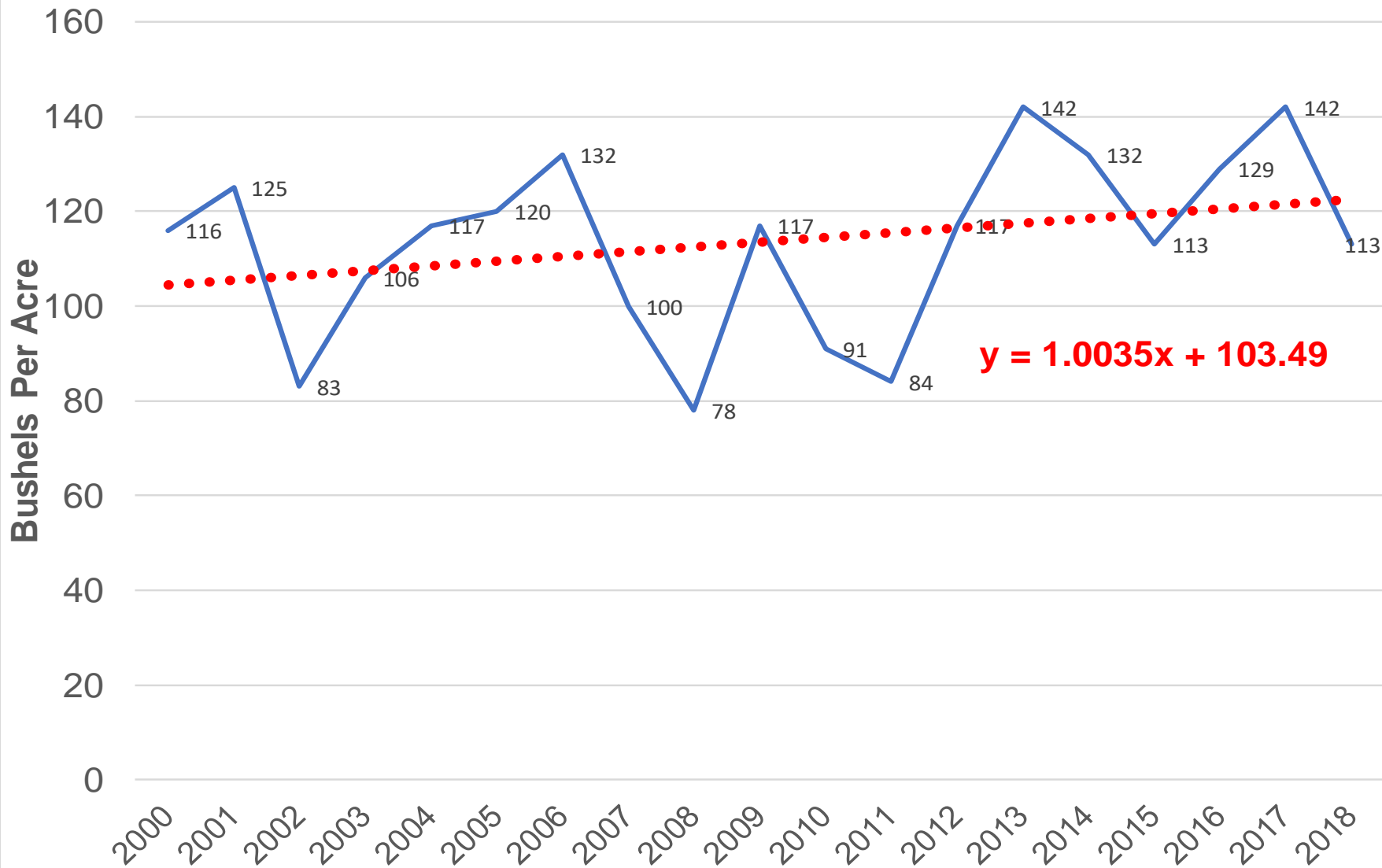
# Current Average Profitability of NC Row Crops 2019 Planting Period: Rented Land

Budget Comparison 2019 Crop Year of Crop Choices Given Current Market Conditions and Expected Yields					
Enter Average Land Rent Value Here	110				
	Corn	Soybean	Wheat	Sorghum	Cotton
Yield (bu/acre) <sup>1</sup>	127	36	53	55	
Yield (lbs./acre)--Cotton	--	--	--	--	837
Yield (lbs./acre)--Cotton Seed	--	--	--	--	1,398
Price (New Crop Futures Price from CME & NYBOT 4/23/2019)	\$3.82	\$9.09	\$4.43	\$3.63	\$0.77
Cotton Seed	--	--	--	--	\$0.08
Current New Crop Basis	\$0.70	(\$0.14)	\$0.00	\$0.67	(\$0.02)
<b>EXPECTED NET PRICE (New Crop Futures + Basis)<sup>2</sup></b>	<b>\$4.52</b>	<b>\$8.95</b>	<b>\$4.43</b>	<b>\$4.29</b>	<b>\$0.75</b>
<b>Gross Revenue</b>	<b>\$572.23</b>	<b>\$325.78</b>	<b>\$233.90</b>	<b>\$236.17</b>	<b>\$739.75</b>
<b>VARIABLE EXPENSES<sup>1</sup></b>					
Total Variable Costs	\$540.00	\$362.13	\$308.68	\$374.69	\$759.24
Return above Variable Costs	\$32.24	-\$36.35	-\$74.78	-\$138.52	-\$19.49
<b>FIXED EXPENSES</b>					
Total Fixed Costs	\$65.70	\$82.63	\$33.31	\$80.66	\$113.16
Total Cost	\$605.70	\$444.76	\$341.99	\$455.35	\$872.40
<b>NET RETURNS TO FARMER AND RISK:</b>	<b>(\$33.46)</b>	<b>(\$118.98)</b>	<b>(\$108.09)</b>	<b>(\$219.18)</b>	<b>(\$132.65)</b>
Break Even Yield	134	50	77	106	1163
Break Even Price	\$4.78	\$12.22	\$6.48	\$8.28	\$0.91
Break Even Yield % of 5 yr. aver.	105.8%	136.5%	146.2%	202.0%	138.9%



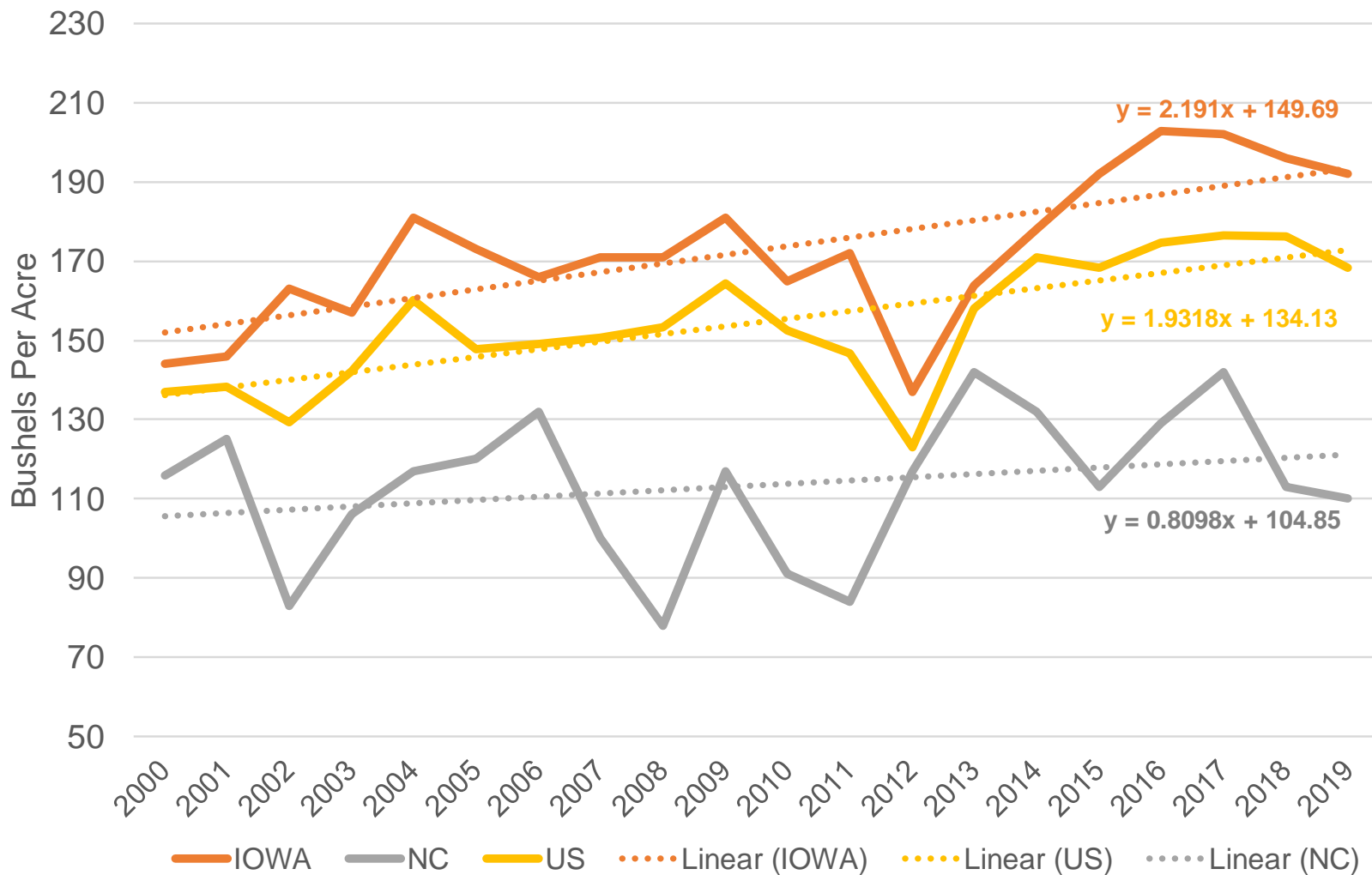


# NC Corn Yields 2000-2018





# Corn Yields for North Carolina, Iowa, and United States 2000-2019





# NC Wheat Yields 2000-2018

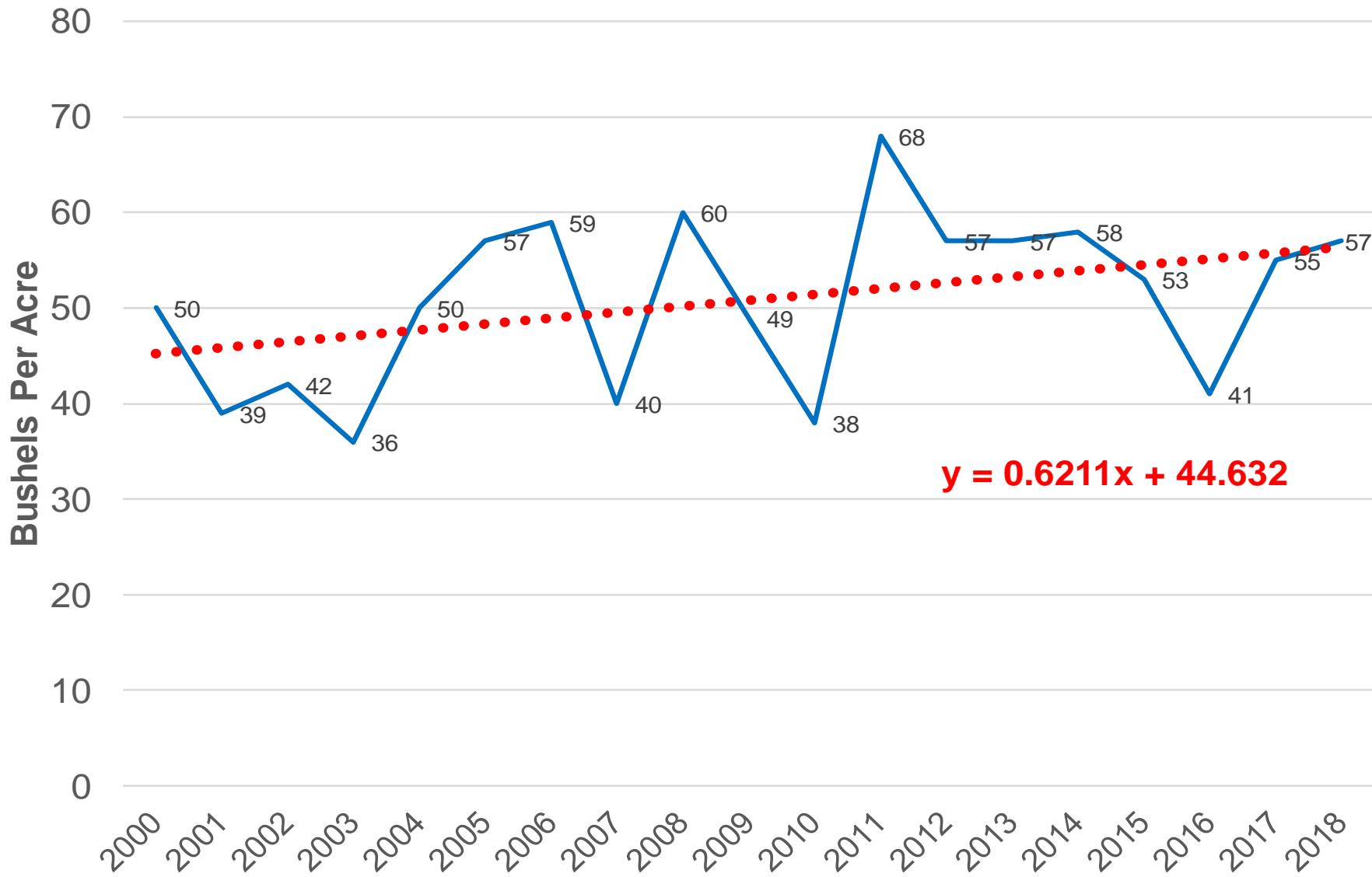
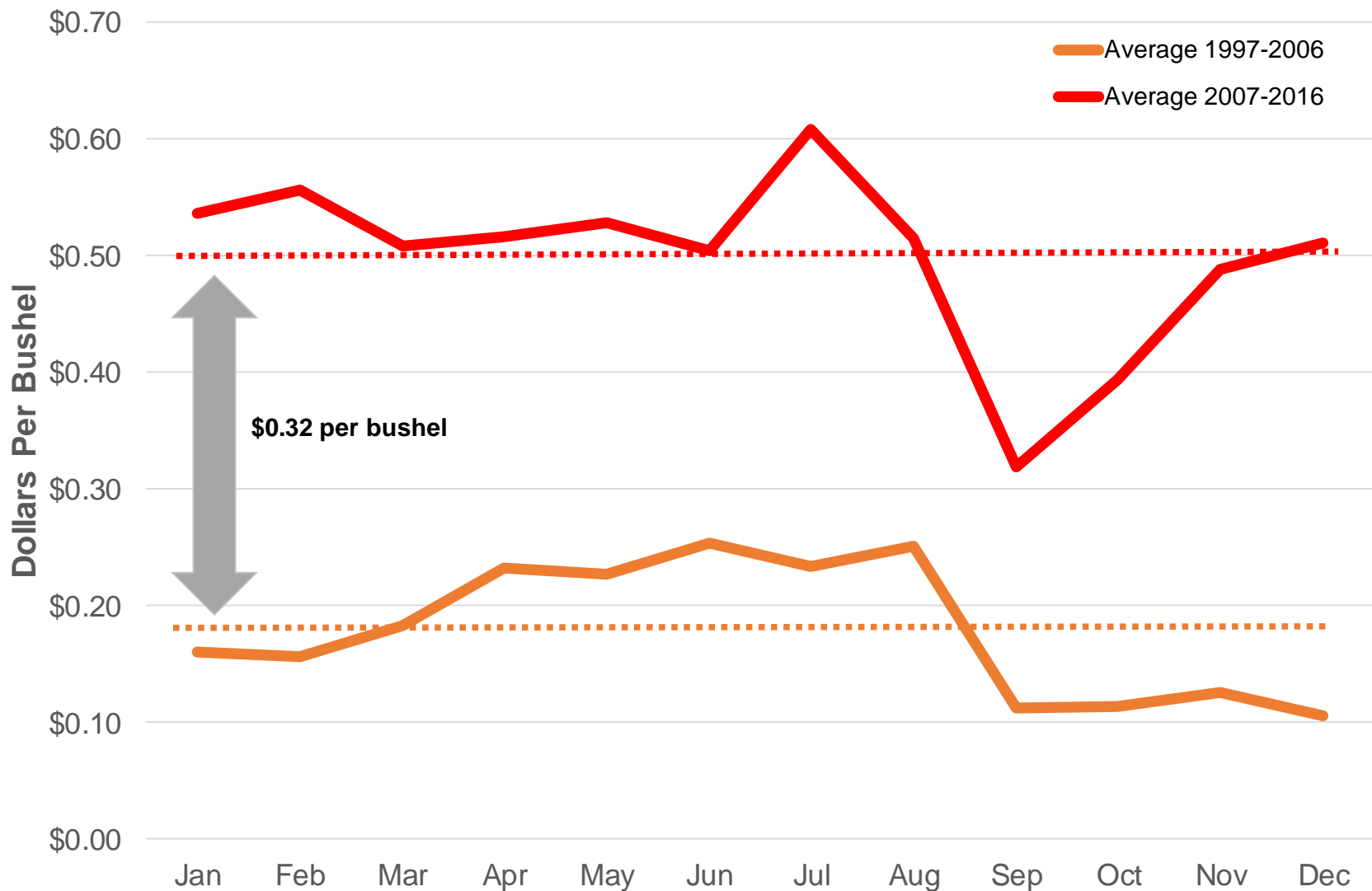




Figure 1: Difference in Monthly Average Nearby Basis at Rose Hill, North Carolina for the Periods 1997-2006 and 2007-2016



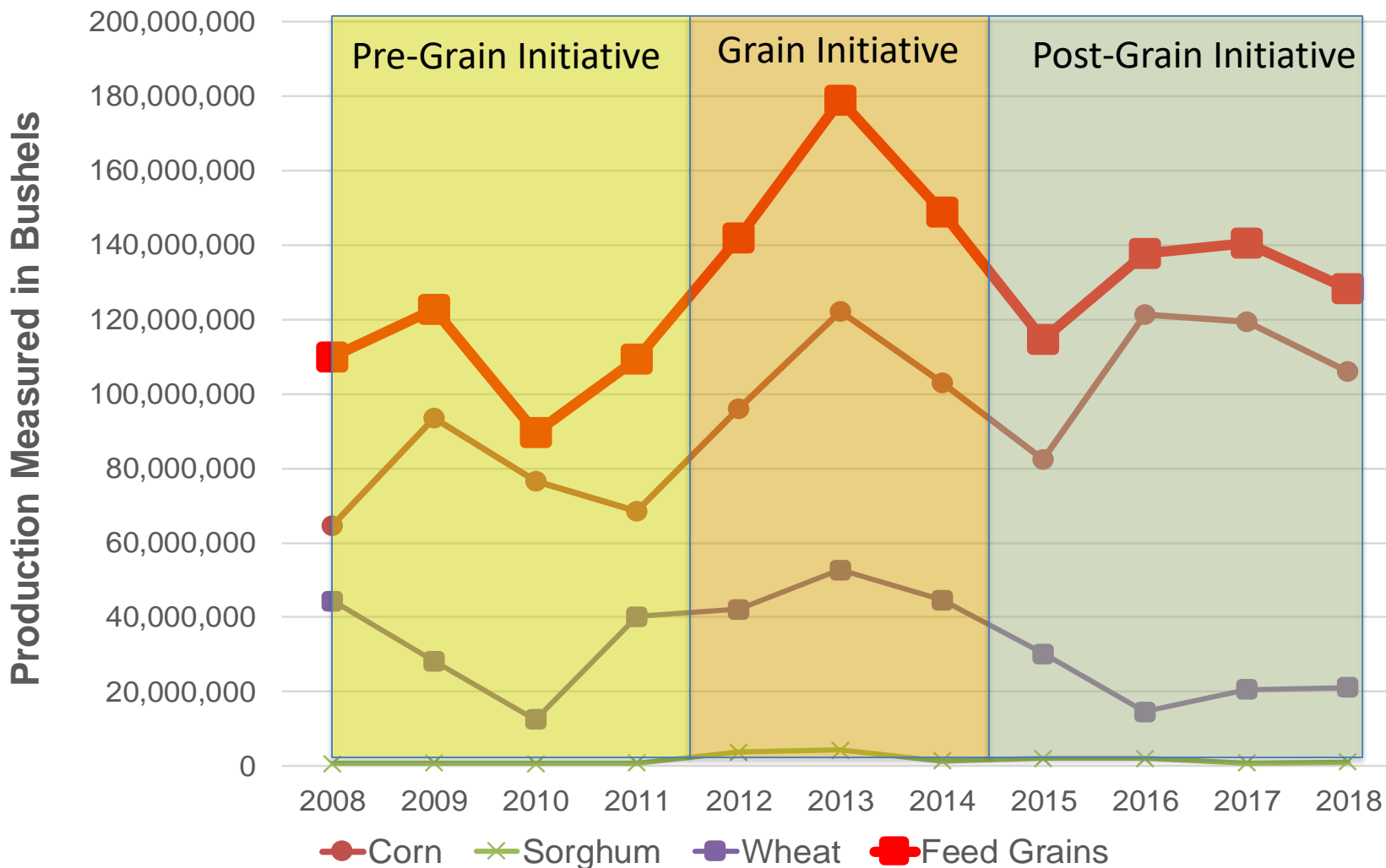


# The Problem

- Mutually beneficial partnership with diverging goals between two parties
  - NC livestock industry needs to procure feed grains at the lowest cost possible to be profitable
  - NC row crop farmers need to sell feed grains at the highest price possible to be profitable
- Each party faces unique challenges
  - NC livestock faces risk with respect to having to procure almost half its needs from out-of-state the cost of doing so is increasing
  - NC row crop farmers face low prices that are currently not profitable



# NC Feed Grain Crop Production 2008-2017





# Potential for a Win-Win Strategy

- For NC to become more self-sufficient in feed grains thereby reducing the deficit. To do this requires:
  - more feed grain acres planted consistently year-over-year
  - further yield increases and a reduction in variation
  - more local storage
- Calls for a change in the way the two parties do business
  - livestock industry must incentivize new crop acres by increasing the use of contracts (forward or basis) that makes it profitable
  - row crop farmers must be prepared to engage in the use of contracts (forward or basis) that gives the livestock industry guaranteed acreage



# Innovative Contracting Possibilities

- Preferred grower contracts for multiple feed grain crops for example corn and wheat jointly
  - Livestock industry offers terms that incentivize growers to commit to planting a portfolio of feed grain acres profitably
  - Goal is to increase and then maintain higher levels of feed grain production than currently is the case
  - Livestock industry benefits from sourcing more of its feedstock locally with reduction in procurement risk and uncertainty
  - Row crop growers benefit from locking in profitable production and reducing price risk
- This would require some growers' approach to marketing to be transformed through education





# Final Thoughts

- ❑ Livestock sector is the backbone of the NC agricultural economy based on cash receipts
- ❑ Its long-term vitality relies on an affordable and reliable source of feed. Cost of importing feed rising.
- ❑ Makes sense to increase feed grain production locally
- ❑ Low feed grain prices have impacted NC feed grain acreage and production, particularly wheat
- ❑ Feed grain acreage will recover when it becomes more profitable
- ❑ Both buyers and sellers are incentivized to be innovative in contracting alternatives