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MISSISSIPPI AND US SOYBEAN YIELD TRENDS

In the Jan. 8, 2018 online edition of AgFax Weekend, an article titled "Soybeans: What's Up with Record Yields, Especially in the Southeast? 3 Reasons" refers to an article ("IFES 2017: What is up with soybean yields?") and presentation by Dr. Scott Irwin, Professor in the Dept. of Agricultural and Consumer Economics at the Univ. of Illinois, that appeared in that institution's *farmdoc daily* on Dec. 29, 2017. As the title implies, Dr. Irwin presents a narrative about high soybean yields in the US in the last four years, and states that the US average soybean yield set new records in a stair-step fashion between 2014 and 2016, with yields of 47.5, 48, and 52 bu/acre, respectively. The NASS-estimated average US yield of 49.5 bu/acre for 2017 is the second highest on record.

Dr. Irwin states that there are only three possible sources of this soybean yield gain. The first is growing season weather, the second is genetic improvement in soybean varieties, and the third is management. His analyses results showed that the high yields in the last four years could be explained by a continuation of the improvement in management technology and good growing season weather. He cites a study with results that indicate a linear progression of soybean genetic yield gain from 1970-2008, which shows that the historical pattern of soybean genetic gains in yield have been steady and marked jumps in the rate of improvement are rare. Overall, there is little evidence that soybean genetic gains have been improving at a faster rate in recent years. Click on the above presentation for details of Dr. Irwin's analyses.

Further analysis of soybean yield gains in the US in this article and presentation showed that yield trends in the Southeastern states have been increasing at a faster rate than in the rest of the country. Dr. Irwin states that this non-linear trend appears to be related to management practices that include planting earlier maturing soybean varieties earlier, rotating soybeans with corn, and using raised bed production systems. This increasing trend for Mississippi soybean yield in relation to the national average is shown in the below graphs.

Soybean yields in Mississippi and adjoining Midsouthern states in relation to national average yields during the last 6 years are shown in the below table. The four states shown in the table all had average yields >50 bu/acre in 2017, and all exceeded the national average. In a majority of state-year cases during the 2012-2017 period, average yields exceeded the national average.

A nagging drawback to producing soybeans in the early planting–early maturing system (ESPS) that has contributed to the increasing yield trend in the Midsouth has been the susceptibility of maturing/mature seed in these plantings to damage caused by conditions during and after maturity. The effect of this malady has been detailed in an earlier blog on this website. While significant seed damage has only occurred infrequently across the entire region, its effect is devastating when it more frequently occurs in isolated instances and results in significant lost revenue to producers who are affected. Recent genetic development of seed traits that appear to provide protection against the causes of this seed damage can be/soon will be incorporated into agronomically acceptable soybean varieties for use in ESPS plantings, and this improvement will be a boon for Midsouth soybean production.

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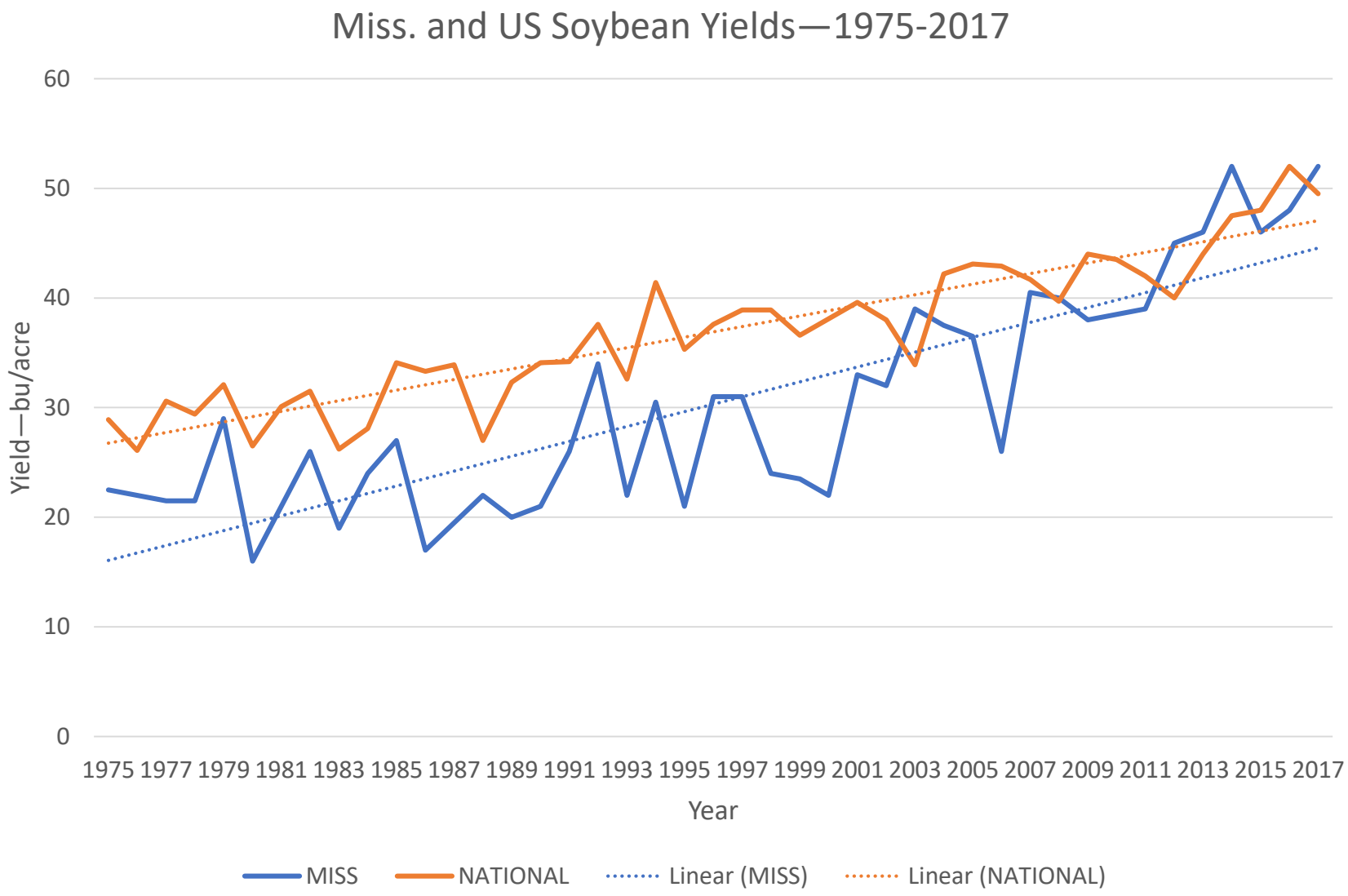
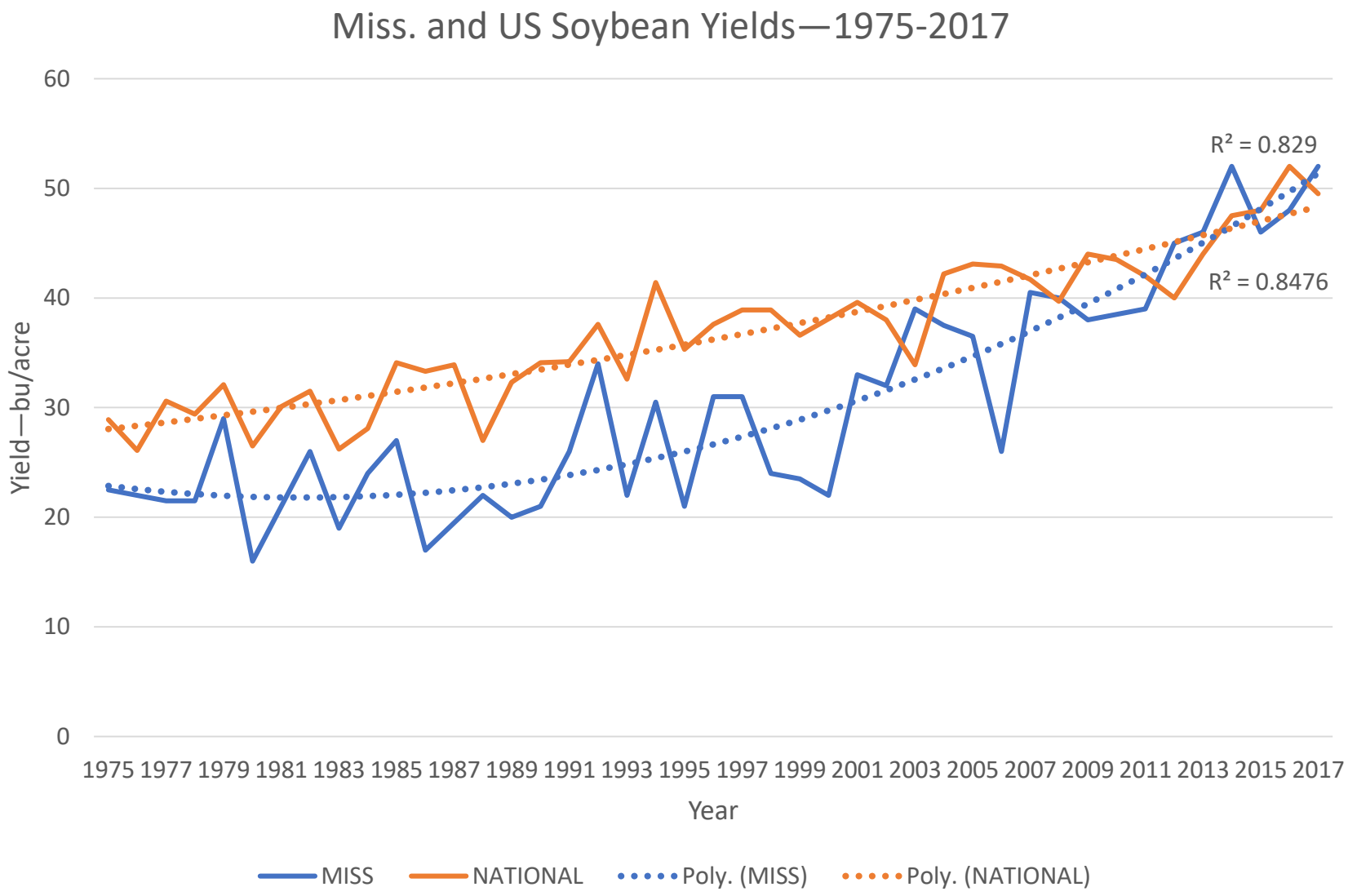
NATIONAL AND MIDSOUTHERN US STATES' AVERAGE SOYBEAN YIELDS–2012-2017*		
Year	**State**	**Yield**
		bu/acre
2017	Arkansas	**50.0**
2017	Louisiana	**54.0**
2017	Mississippi	**52.0**
2017	Tennessee	**51.0**
2017	National avg.	49.5
2016	Arkansas	47.0
2016	Louisiana	48.5
2016	Mississippi	48.0
2016	Tennessee	45.0
2016	National avg.	52.0
2015	Arkansas	**49.0**
2015	Louisiana	41.0
2015	Mississippi	46.0
2015	Tennessee	46.0
2015	National avg.	48.0
2014	Arkansas	**49.5**
2014	Louisiana	**56.6**
2014	Mississippi	**52.0**
2014	Tennessee	46.0
2014	National avg.	47.7
2013	Arkansas	**43.5**
2013	Louisiana	**48.5**
2013	Mississippi	**46.0**
2013	Tennessee	**46.5**
2013	National avg.	44.0
2012	Arkansas	**43.5**
2012	Louisiana	**46.5**
2012	Mississippi	**45.0**
2012	Tennessee	38.0
2012	National avg.	40.0
*NASS		


Miss. and US Soybean Yields—1975-2017
60
50
40
30
20
10
0
Yield—bu/acre
1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Year
MISS
NATIONAL
Linear (MISS)
Linear (NATIONAL)


Miss. and US Soybean Yields—1975-2017
60
50
40
30
20
10
0
Yield—bu/acre
R² = 0.829
R² = 0.8476
1975 1977 1979 1981 1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017
Year
MISS
NATIONAL
Poly. (MISS)
Poly. (NATIONAL)