AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

farmdoc DAILY

Department of Agricultural and Consumer Economics, University of Illinois Urbana-Champaign

Has the Era of Decreasing Per Acre Corn Costs Come to an End?

Gary Schnitkey

Department of Agricultural and Consumer Economics
University of Illinois

June 21, 2018

***farmdoc daily* (8):114**

Recommended citation format: Schnitkey, G. "Has the Era of Decreasing Per Acre Corn Costs Come to an End?" *farmdoc daily* (8):114, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, June 21, 2018.

Permalink: http://farmdocdaily.illinois.edu/2018/06/era-of-decreasing-per-acre-corn-costs.html

Since 2014, non-land costs of producing corn on high-productivity farmland in central Illinois declined from $617 per acre in 2014 to $569 per acre in 2017, a decrease of $48 per acre. Three costs – fertilizer, drying, fuel and oil – contributed more than the $48 per acre to the total non-land cost decrease, meaning that other costs increased from 2014 to 2017. Levels of fertilizer, drying, and fuel costs are highly related to energy prices. Energy prices have been rising in recent months. Rising energy prices could signal the end to declines in non-land production costs for corn.

Non-land Costs for 2017

Final costs for 2017 crop production are now available in a publication entitled *Revenue and Costs for Corn, Soybeans, Wheat, and Double-Crop Soybeans* which is available in the management section of *farmdoc*. This document summarizes revenue and costs from farms enrolled in Illinois Farm Business Farm Management (FBFM). Table 1 shows a table from that publication for corn grown in central Illinois on high-productivity farmland.

In 2018, non-land costs totaled $569 per acre. As can be seen in Table 1, non-land costs included direct costs (fertilizer, pesticides, seed, drying, storage, and crop insurance), power costs (machine hire/lease, utilities, machine repair, fuel and oil, light vehicle, and machinery depreciation), and overhead costs (hired labor, building repair and rent, building depreciation, insurance, misc, and interest on non-land items). All financial costs except those related to farmland control are included in non-land costs. Land control costs are separated into the "land costs" category.

Non-land costs reached a high of $617 per acre in 2014. The 2017 non-land costs of $569 per acre are $49 less than the 2014 high. Obviously, large cost reductions of cost have occurred since 2014.

From 2014 to 2017, fertilizer had the largest decline, decreasing from $171 per acre to $135 per acre, a decrease of $36 per acre (see Figure 1). The next two categories with the largest cost decreases were drying ($12 per acre decrease) and fuel and oil ($9 per acre decrease). The values of these three costs are highly related to energy prices. The correlation coefficient between fertilizer costs and crude oil prices is .84 for the years from 1995 to 2017, .74 for drying, and .61 for fuel and oil. According to the U.S. Energy Information Administration, the spot price of a barrel of crude oil at Cushing, Oklahoma averaged $94 per barrel in 2014. Crude oil prices average $49 per barrel in 2018, $43 in 2016, and $51 in 2017.

We request all readers, electronic media and others follow our citation guidelines when re-posting articles from farmdoc daily. Guidelines are available here. The farmdoc daily website falls under University of Illinois copyright and intellectual property rights. For a detailed statement, please see the University of Illinois Copyright Information and Policies here.

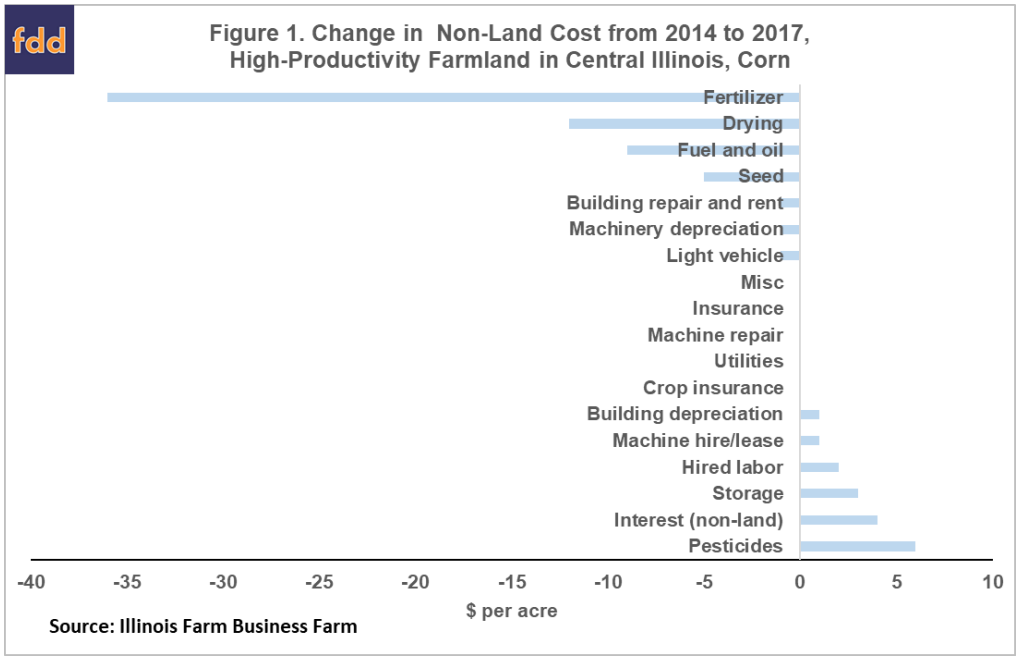
Table 1. Corn Revenues and Costs, Central Illinois -- High Productivity Farmland, Actual for 2011 through 2017, Projected for 2018.[1]

	Year							
	2011	2012	2013	2014	2015	2016	2017	2018P
Yield per acre	174	126	197	231	200	228	227	205
Price per bu	$6.24	$6.93	$4.52	$3.76	$3.79	$3.47	$3.50	$3.60
Crop revenue	$1,086	$873	$890	$869	$758	$791	$795	$738
ARC/PLC or ACRE	0	0	0	4	45	12	1	0
Other gov't payments	24	24	22	0	0	0	0	0
Crop insurance proceeds	23	295	61	10	31	2	6	0
Gross revenue	**$1,133**	**$1,192**	**$973**	**$883**	**$834**	**$805**	**$802**	**$738**
Fertilizers	159	200	193	171	166	154	135	130
Pesticides	50	49	66	67	66	64	73	73
Seed	96	108	114	120	118	116	115	114
Drying	19	16	24	28	15	13	16	16
Storage	8	7	8	12	14	11	15	15
Crop insurance	30	25	27	24	24	22	24	24
Total direct costs	**$362**	**$405**	**$432**	**$422**	**$403**	**$380**	**$378**	**$372**
Machine hire/lease	8	10	11	12	12	12	13	13
Utilities	4	5	5	5	5	5	5	5
Machine repair	17	22	22	24	22	22	24	24
Fuel and oil	18	23	24	24	17	14	15	15
Light vehicle	1	2	2	2	1	1	1	1
Mach. depreciation	39	55	63	65	67	65	64	63
Total power costs	**$87**	**$117**	**$127**	**$132**	**$124**	**$119**	**$122**	**$121**
Hired labor	14	14	16	16	17	17	18	18
Building repair and rent	5	8	6	6	5	4	5	5
Building depreciation	6	9	5	11	12	12	12	12
Insurance	8	9	10	10	10	10	10	10
Misc	8	8	8	9	8	8	9	9
Interest (non-land)	13	11	11	11	13	13	15	16
Total overhead costs	**$54**	**$59**	**$56**	**$63**	**$65**	**$64**	**$69**	**$70**
Total non-land costs	**$503**	**$581**	**$615**	**$617**	**$592**	**$563**	**$569**	**$563**
Operator and land return	**$630**	**$611**	**$358**	**$266**	**$242**	**$242**	**$233**	**$175**
Land costs	248	270	290	293	278	273	267	264
Farmer return	**$382**	**$341**	**$68**	**-$27**	**-$36**	**-$31**	**-$35**	**-$89**

[1]Results for 2011 through 2017 are summarized from grain farms enrolled in Illinois Farm Business Farm Management. Projections are made for 2018.

Prepared by: Gary Schnitkey, University of Illinois, schnitke@illinois.edu, 217 244-9595, June 2018.
Available in the management section of *farmdoc* (www.farmdoc.illinois.edu).

The three costs of fertilizer, drying, and fuel taken together declined by $57 per acre from 2014 to 2017. Total non-land cost decreased by $49 per acre, less than the $57 decline in energy-related costs, meaning that some cost categories increased. The largest increase was associated with pesticides, which increased $6 per acre (see Figure 1). Interest costs increased by $4 per acre, storage costs increased $2 per acre, hired labor increased by $2 per acre, machine hire by $1 per acre, and building depreciation by $1 per acre.



Variability in Energy-Related Costs

In recent years, much of the year-to-year variability in non-land costs is due to variability in energy-related costs. To illustrate, Figure 2 shows total non-land costs from 1990 to 2017. Note that total non-land costs went from $209 per acre in 1990 up to $280 in 1997. From 1997 to 2003, non-land cost decreased by $39 per acre to $241 per acre in 2003. Non-land costs more than doubled from 2003 to 2009, reaching $534 per acre in 2009. Non-land costs then fell to $452 in 2010 before rising to $581 in 2012 and $617 in 2014. Then, non-land costs fell to $592 per acre in 2015 and $563 in 2012, before increasing slightly to $569 in 2017.

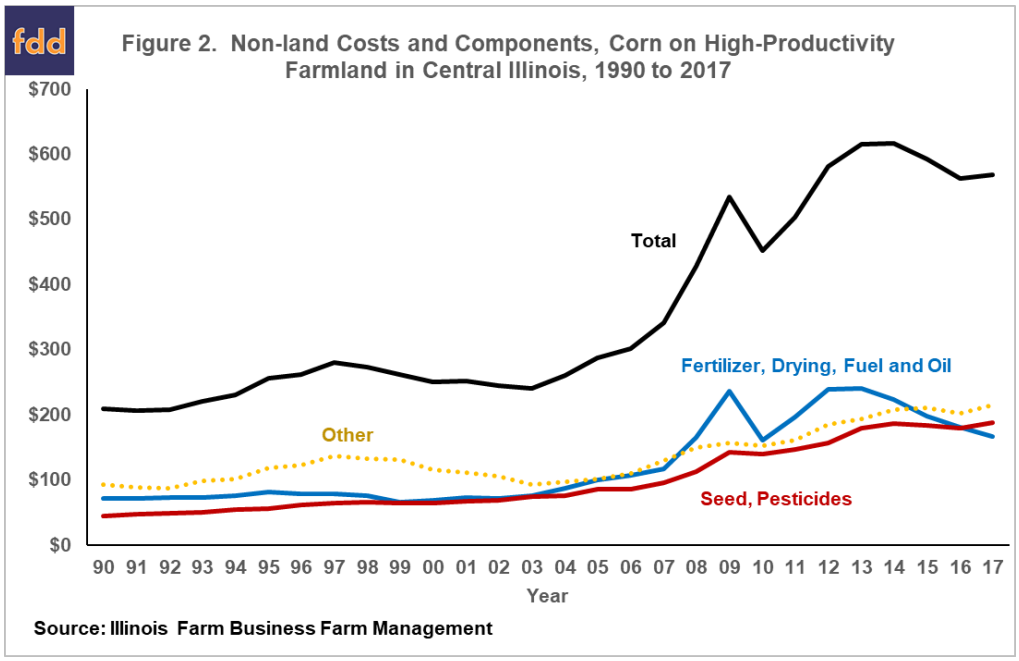


Figure 2 also shows divisions in total non-land costs in three categories:

1. Fertilizer, drying, and fuel — energy-related costs.
2. Seed and pesticides — the two other major production inputs.

3. Other costs — machinery-related costs, crop insurance, storage, hired labor, interest, and other overhead costs.

Energy-related costs were the only category with major variability from year-to-year. For example, the energy-related costs decreased between 2009 to 2010, then increased from 2010 to 2013 before falling each year since 2013 (see Figure 2). Total non-land costs follow the energy-related costs.

Since 2003, costs in the seed and pesticides and in the other categories have generally been increasing (for a more detailed evaluation of fertilizer, pesticide, and seed costs see farmdocDaily, July 12, 2016). There have been some years of small declines. Take 2016 as an example. From 2015 to 2016, seed and pesticides declined by $4 per acre and costs in the other category declined by $8 per acre. This decline is somewhat unusual. From 2003 to 2017, seed and pesticide increased an average of $8 per year while costs in the other category increased by $9 per year.

Implications

In recent years, non-land costs declines have mostly occurred because of decreases in energy-related costs. Non-energy-related costs have generally been increasing. Therefore, some of the energy-related declines have been muted by increases in non-energy-related costs.

Energy prices now appear to be rising. During the week from June 11 to June 18, crude oil prices were near $65 per acre (U.S. Energy Information Administration), above the high $40 to low $50 per barrel averages during 2015 to 2017, but still below the $94 per barrel average during 2014. If historical patterns hold, higher energy prices will result in increasing energy-related costs. At this point, declines in seed, pesticide, and other costs seem unlikely. Rising energy prices could signal the end of decreasing non-land costs.

References

Schnitkey, G. "Revenue and Costs for Corn, Soybeans, Wheat, and Double-Crop Soybeans, Actual for 2011 through 2016, Projected 2017 and 2018." Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 2018.

U.S. Energy Information Administration. *Petroleum & Other Liquids Data:* Cushing, OK WTI Spot Price FOB. Released June 20, 2018, accessed June 21, 2018. https://www.eia.gov/dnav/pet/hist/RWTCD.htm