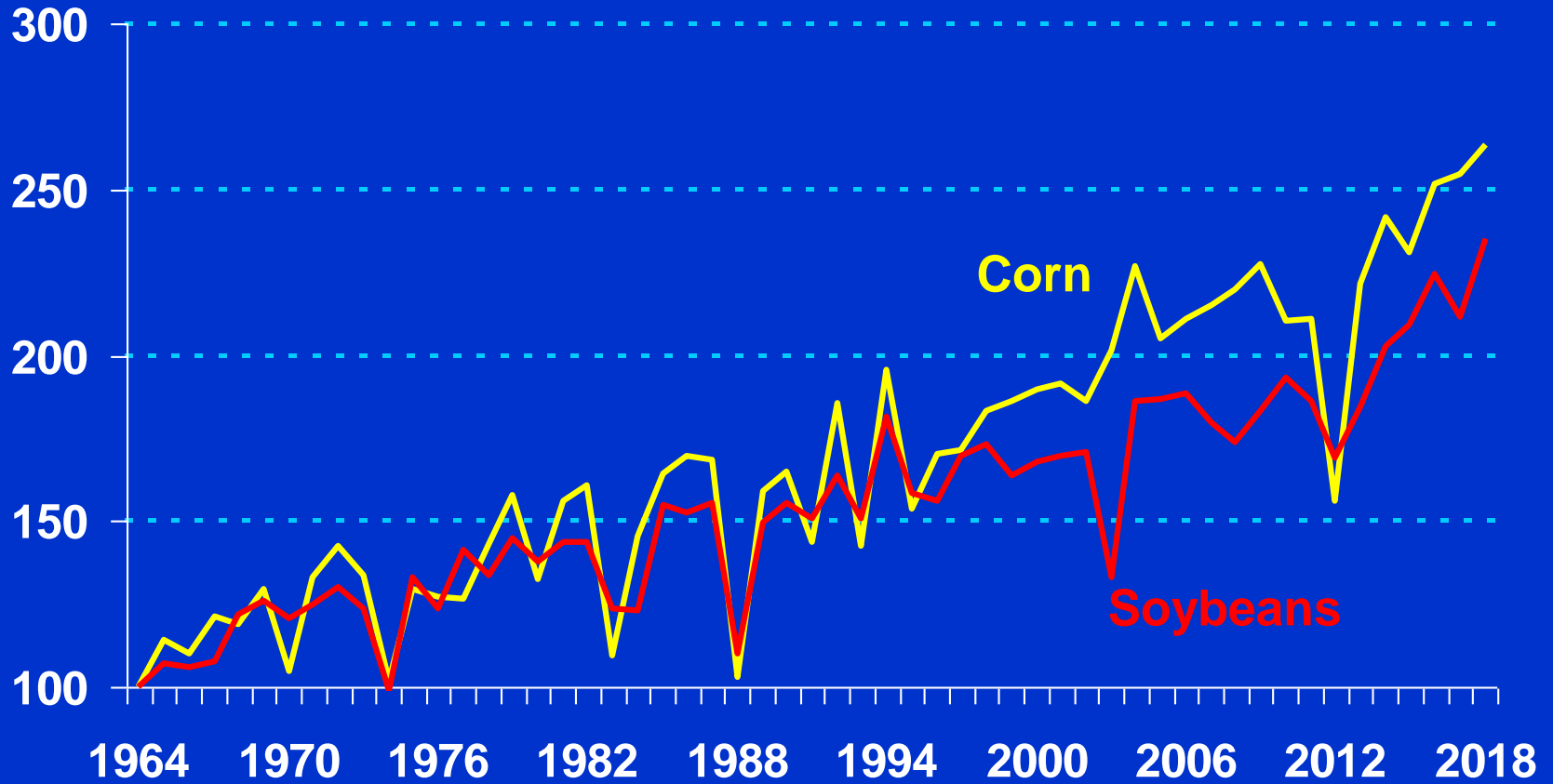

Agricultural Technology's Impacts on Farming and the Rural Midwest

**November 27, 2018
Chicago, Illinois**

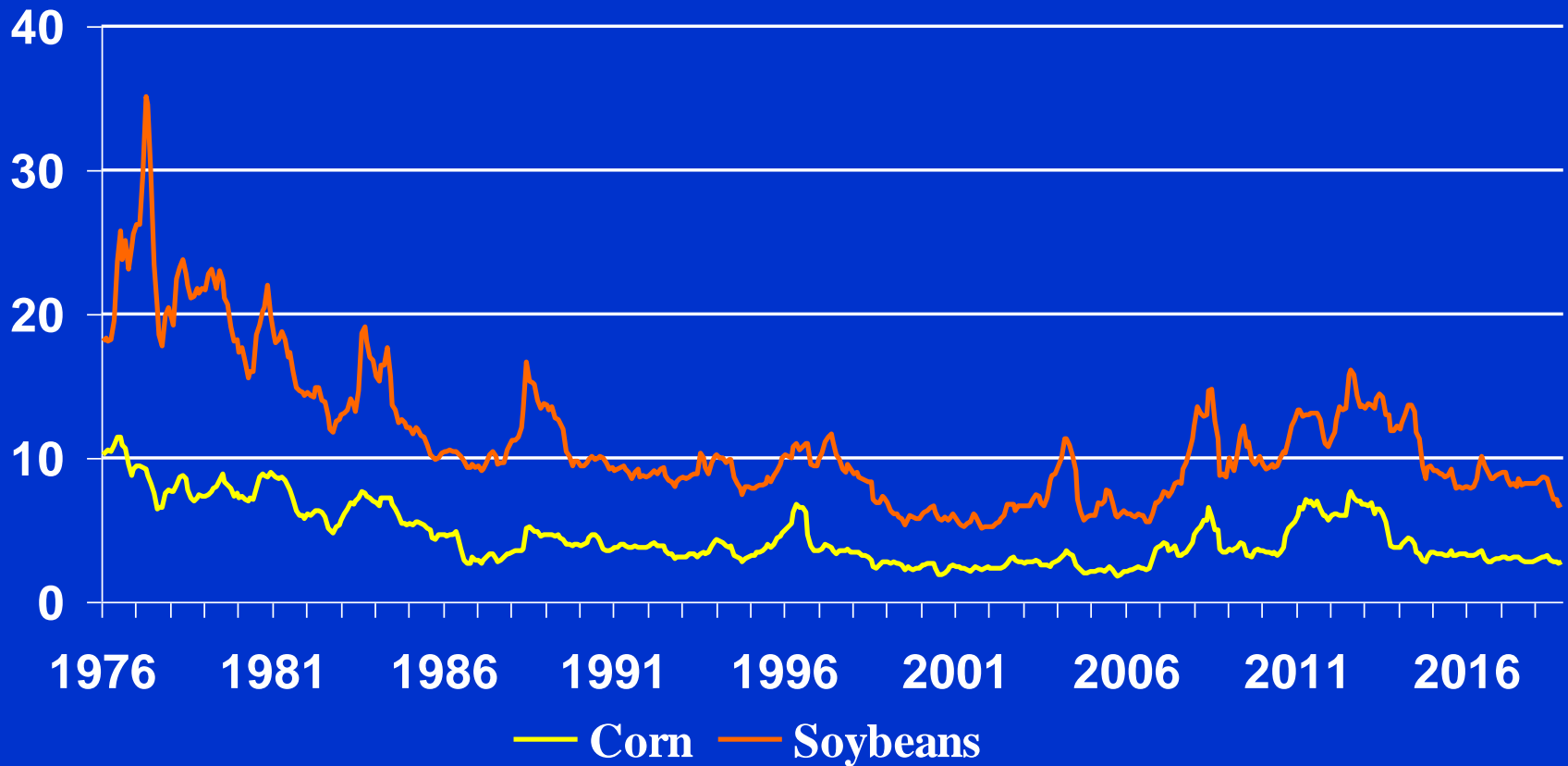
**David Oppedahl
Senior Business Economist
312-322-6122
david.oppedahl@chi.frb.org**

7th District Crop Yield Indexes (1964=100)

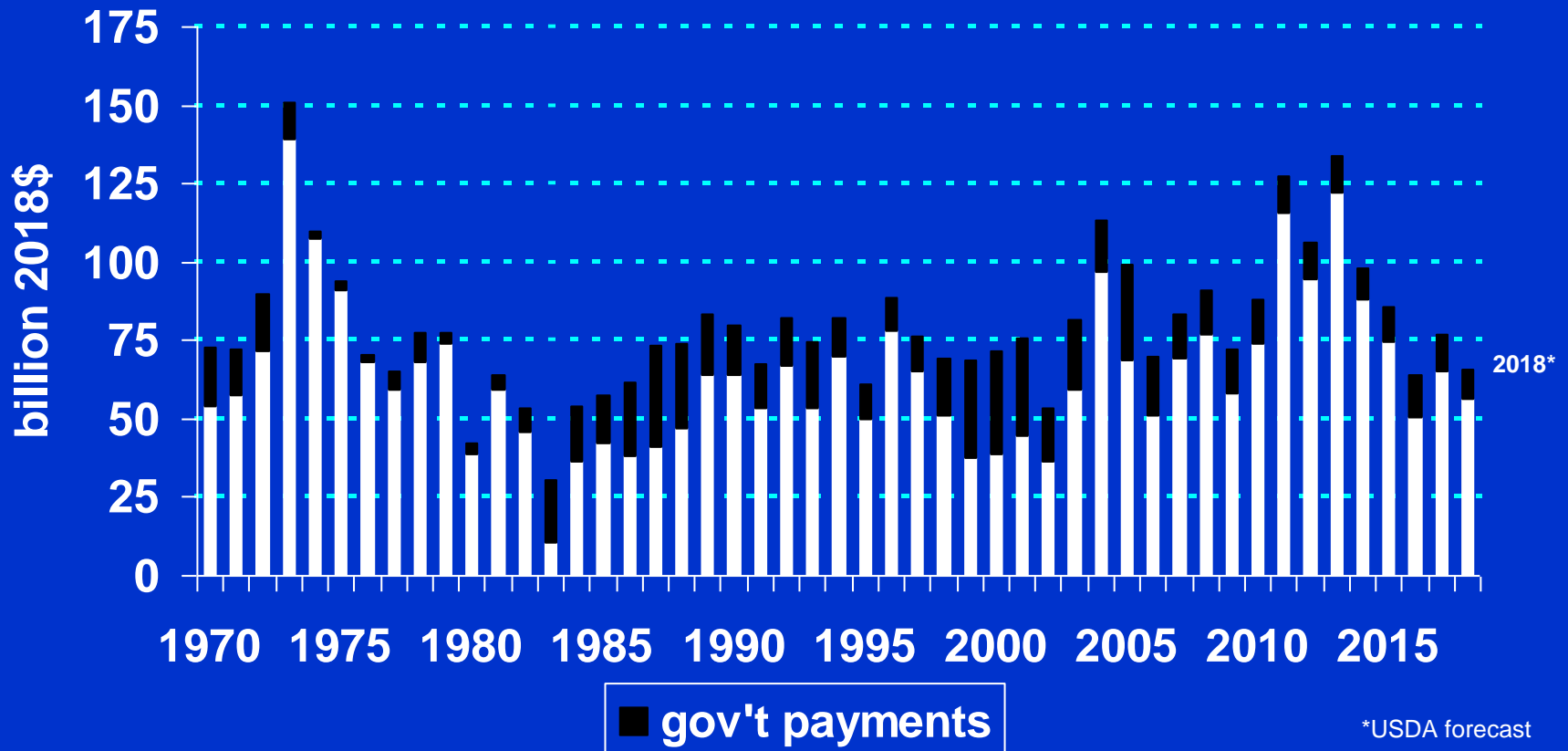


Real Cash Crop Prices

(\$/bushel for Central IL, adjusted by CPI-U for January 2010)

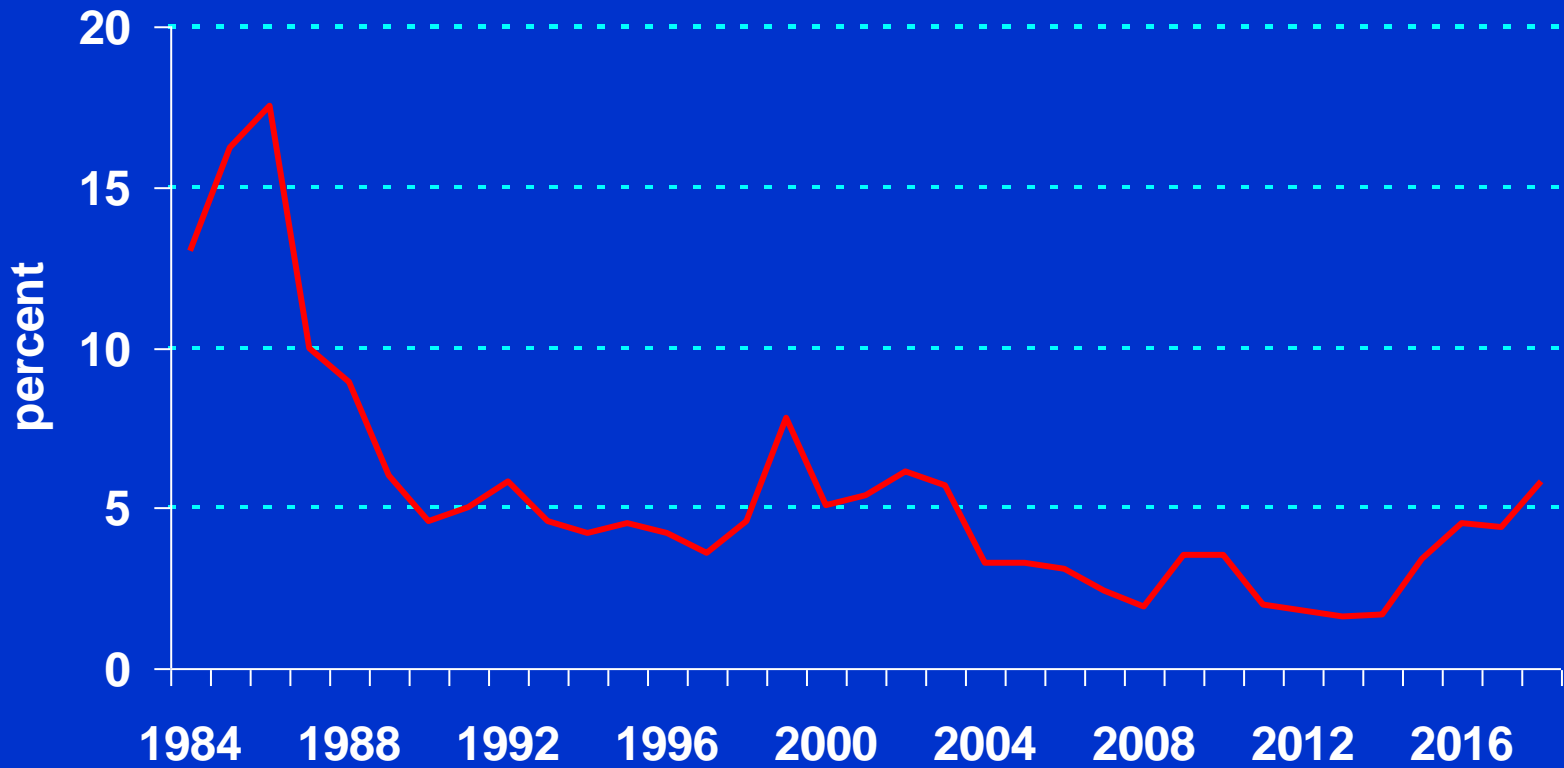


Real net farm income edged up in 2017, but is expected to be down in 2018



Source: USDA, Economic Research Service

Farm loan volume with “major” or “severe” repayment problems in 7th Federal Reserve District (at end of every second quarter)



Source: Federal Reserve Bank of Chicago

Survey results for October 1, 2018

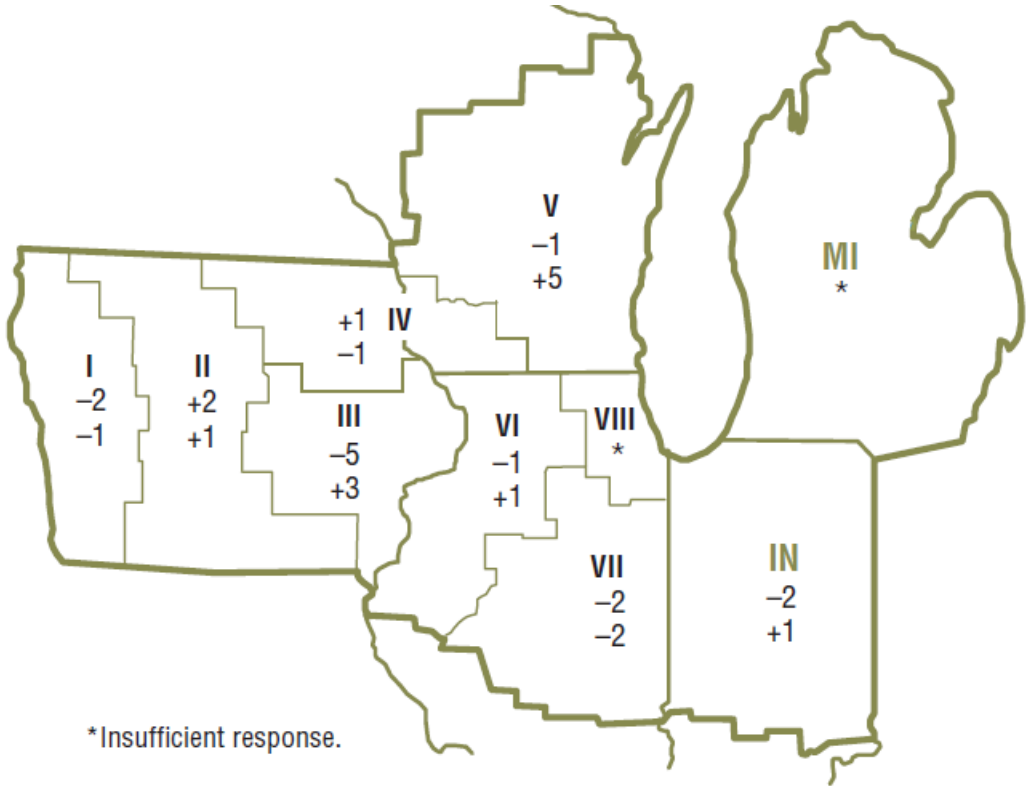


Percent change in dollar value of “good” farmland

Top: July 1, 2018 to October 1, 2018

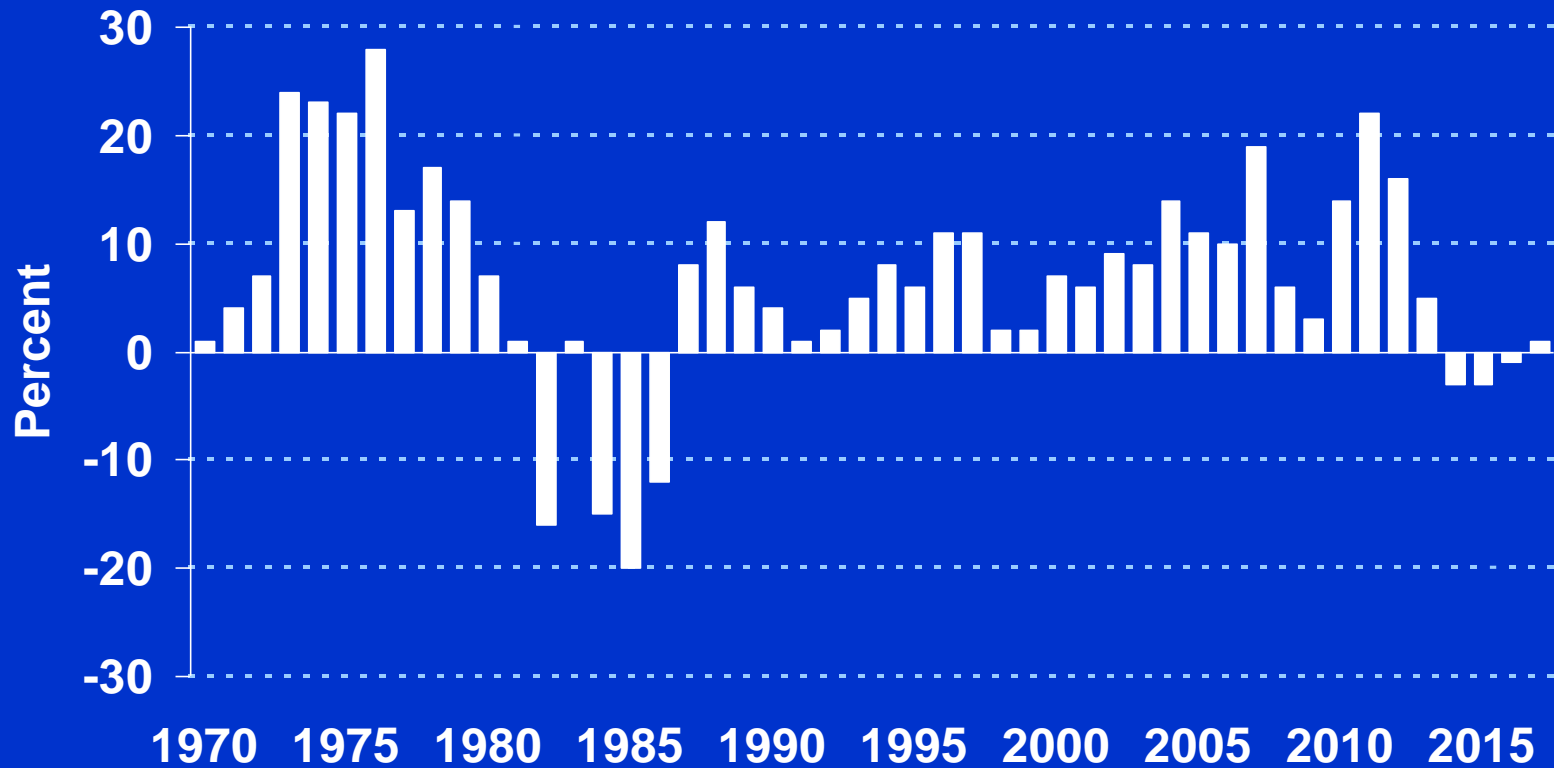
Bottom: October 1, 2017 to October 1, 2018

	<u>July 1, 2018 to October 1, 2018</u>	<u>October 1, 2017 to October 1, 2018</u>
Illinois	-1	-1
Indiana	-2	+1
Iowa	-1	+1
Michigan	*	*
Wisconsin	-1	+4
Seventh District	-1	+1



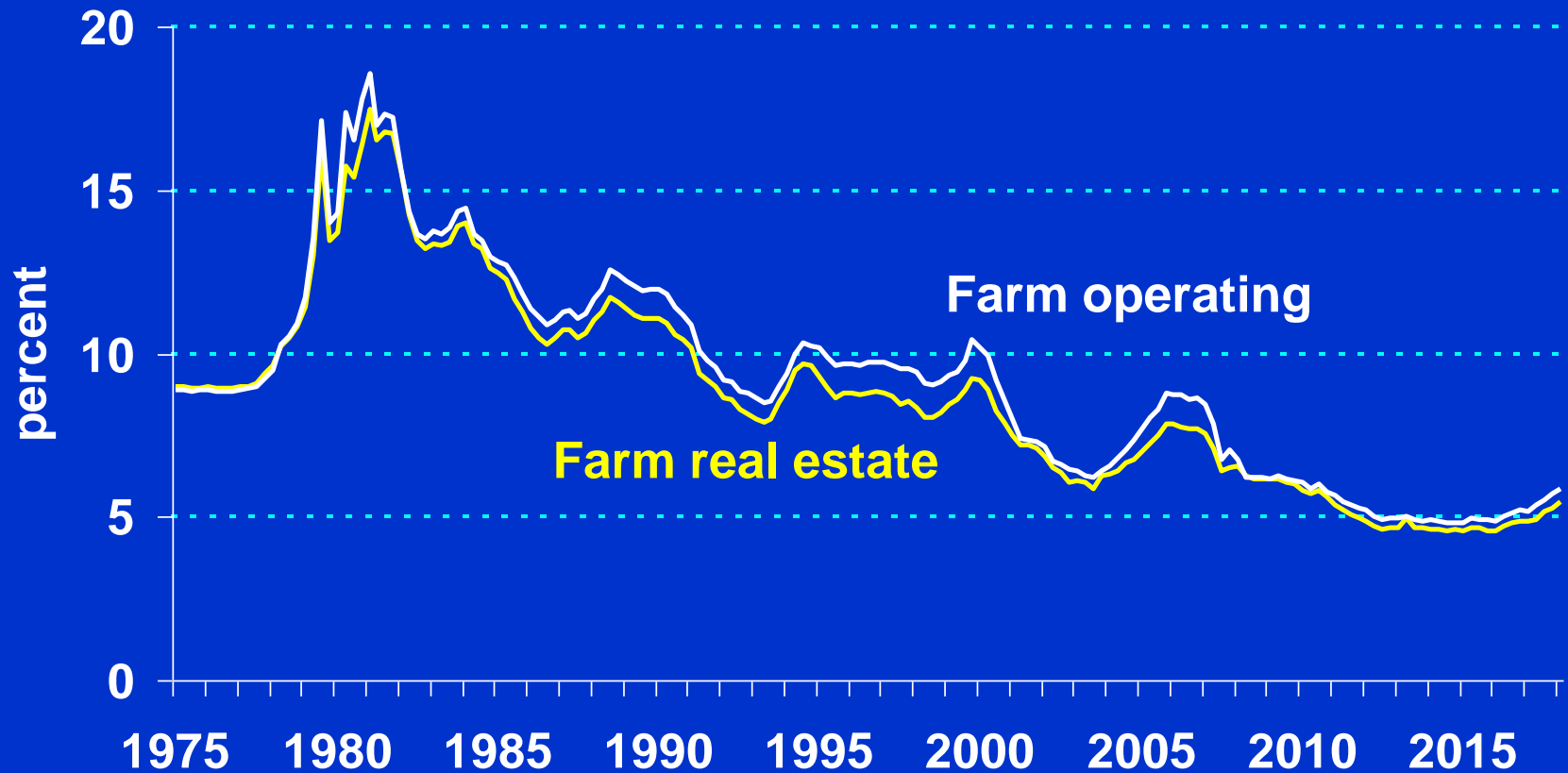
* Insufficient response.

Annual change in farmland values in 7th Federal Reserve District



Source: Federal Reserve Bank of Chicago

Interest rates charged on new farm loans in the 7th Federal Reserve District



The New York Times

As Immigrant Farmworkers Become More Scarce, Robots Replace Humans



An automated harvesting machine at Taylor Farms in Salinas, Calif., uses a high pressure water stream to cut romaine lettuce heads. It replaces a crew of many farmworkers.

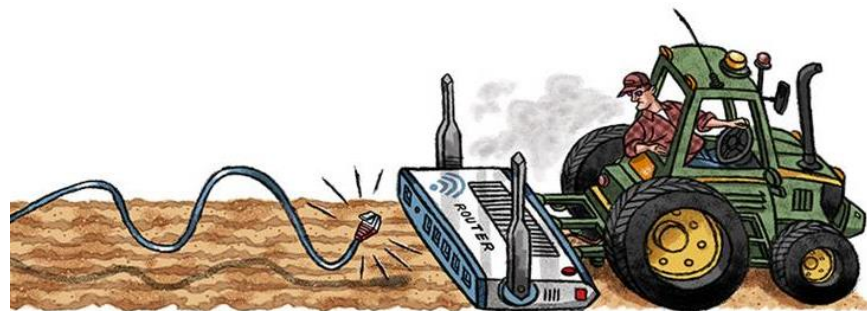
Jim Wilson/The New York Times



Traditional ag-related firms are investing in new technologies

CME Forms Data Partnerships with Two Satellite Imagery Companies

7 MAY 2018



DESPITE DOWNTURN, R&D MONEY IS FLOWING INTO AGRICULTURE

“A LOT OF PEOPLE ARE BETTING ON AGRICULTURE
RIGHT NOW,” SAYS BAYER’S ADRIAN PERCY.

NEWS RELEASES SEPTEMBER 06, 2017

Deere to Advance Machine Learning Capabilities in Acquisition of Blue River Technology

Runs on diesel,
sweat and millions
of data points.

Farmers use Watson to analyze
crops, imagery and weather
systems from the IoT Cloud to
monitor soil conditions, reduce
water waste and increase yields.

FarmBeats: AI & IoT for Agriculture

Established: May 14, 2015



New players in the digital ag space



Let's put
smart
to work.



Many innovative ag technologies

AGTECH LANDSCAPE 2018



In-field Sensors & Systems

Post-Harvest Monitoring & Efficiency

In-field Sensors & Systems			Post-Harvest Monitoring & Efficiency			
Automation 	UAV for Ag 	Big Data Aggregators 	Livestock/Herd Management - Software 	Freshness 	Food Safety Track & Trace 	Food Recovery
VRT Applications 	Imagery Systems 	Data Analytics (Platform) 	Animal Health Technologies 	Cold Chain Monitoring 	ERP 	B2B Marketplace
Input Efficiency 	Field Monitoring Sensors & Solutions 	Imagery Analytics 	Animal Health Technologies 	Quality Management 	Supply Chain 	Trading & Finance
Sensors 	Adaptive Irrigation 	IOT Field Monitoring Platforms 	Crop / Farm Management Software 	Supply Chain Analytics 	3rd Party Logistics 	Market Information
		Food Safety Detection 	Equipment / Asset Tracking 	Equipment / Asset Tracking 		
			Collaboration Technology 			

Agricultural Technology's Impacts on Farming and the Rural Midwest

- Keynote: Karen I. Plaut, Glenn W. Sample Dean of Agriculture, Purdue University
- Session I: The Role of Agricultural Technology in the Future of Midwest Farms
- Session II: Agricultural Technology's Effects on Rural Communities
- Session III: The Role of Broadband for Agricultural Technologies and the Rural Economy of the Midwest
- Session IV: Panel discussion – How will new agricultural technologies be implemented and funded?

#chifedagconf



www.chicagofed.org