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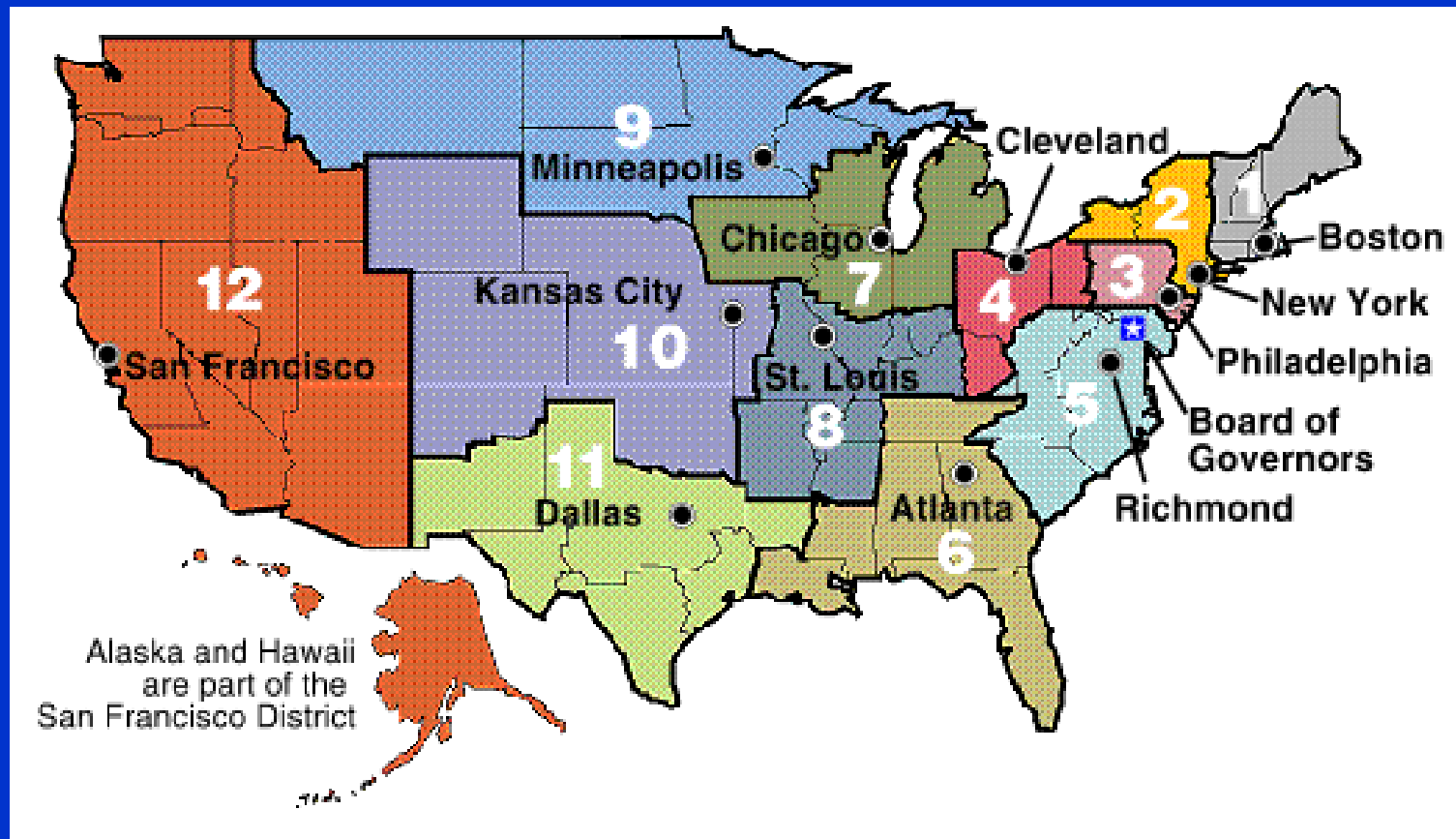
# Agricultural Productivity and the Role of Research

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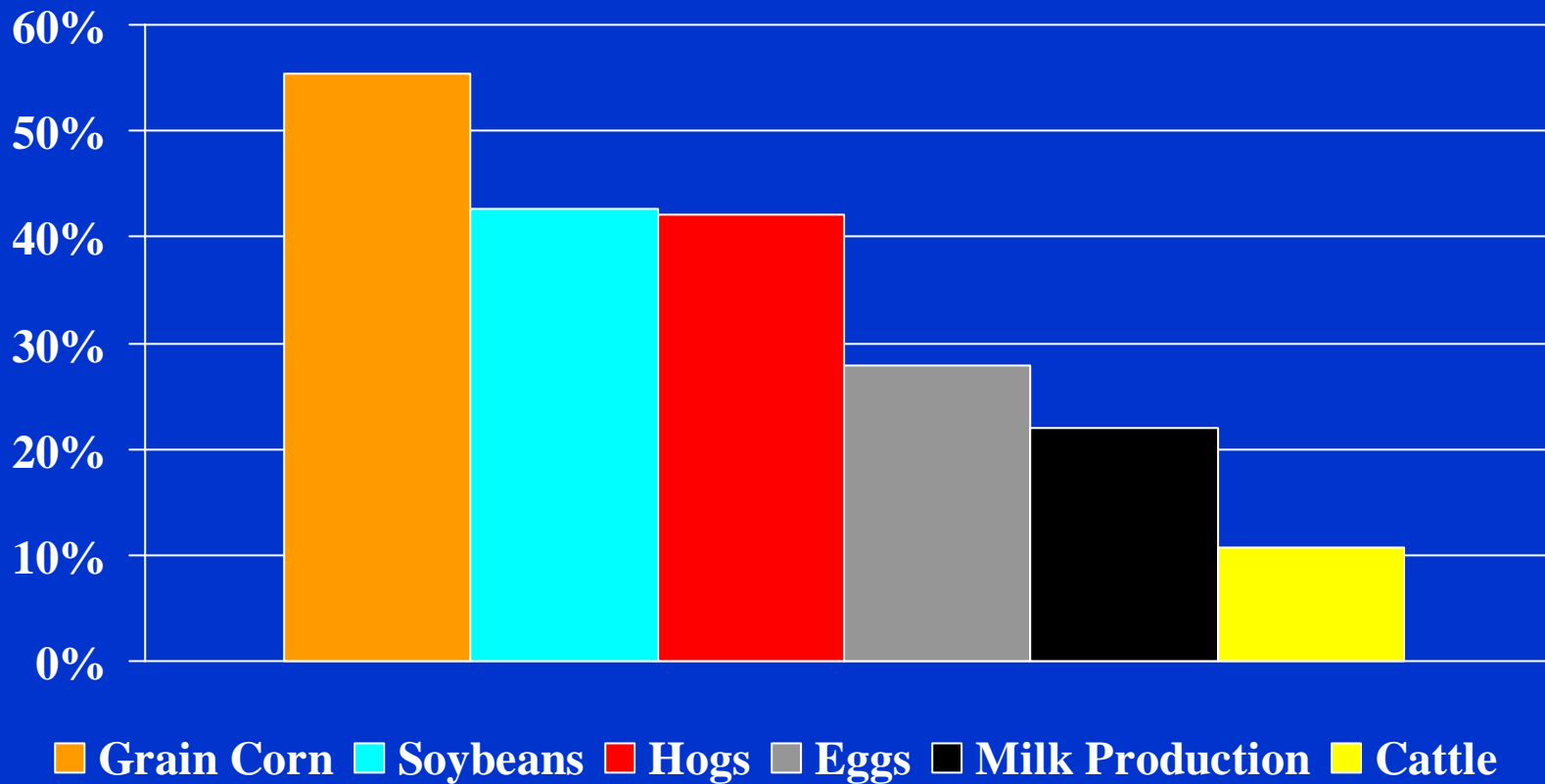
**September 24, 2007**  
**Federal Reserve Bank  
of Chicago**

**David Oppedahl**  
**Business Economist**  
**312-322-6122**  
**[david.oppedahl@chi.frb.org](mailto:david.oppedahl@chi.frb.org)**

# Federal Reserve System

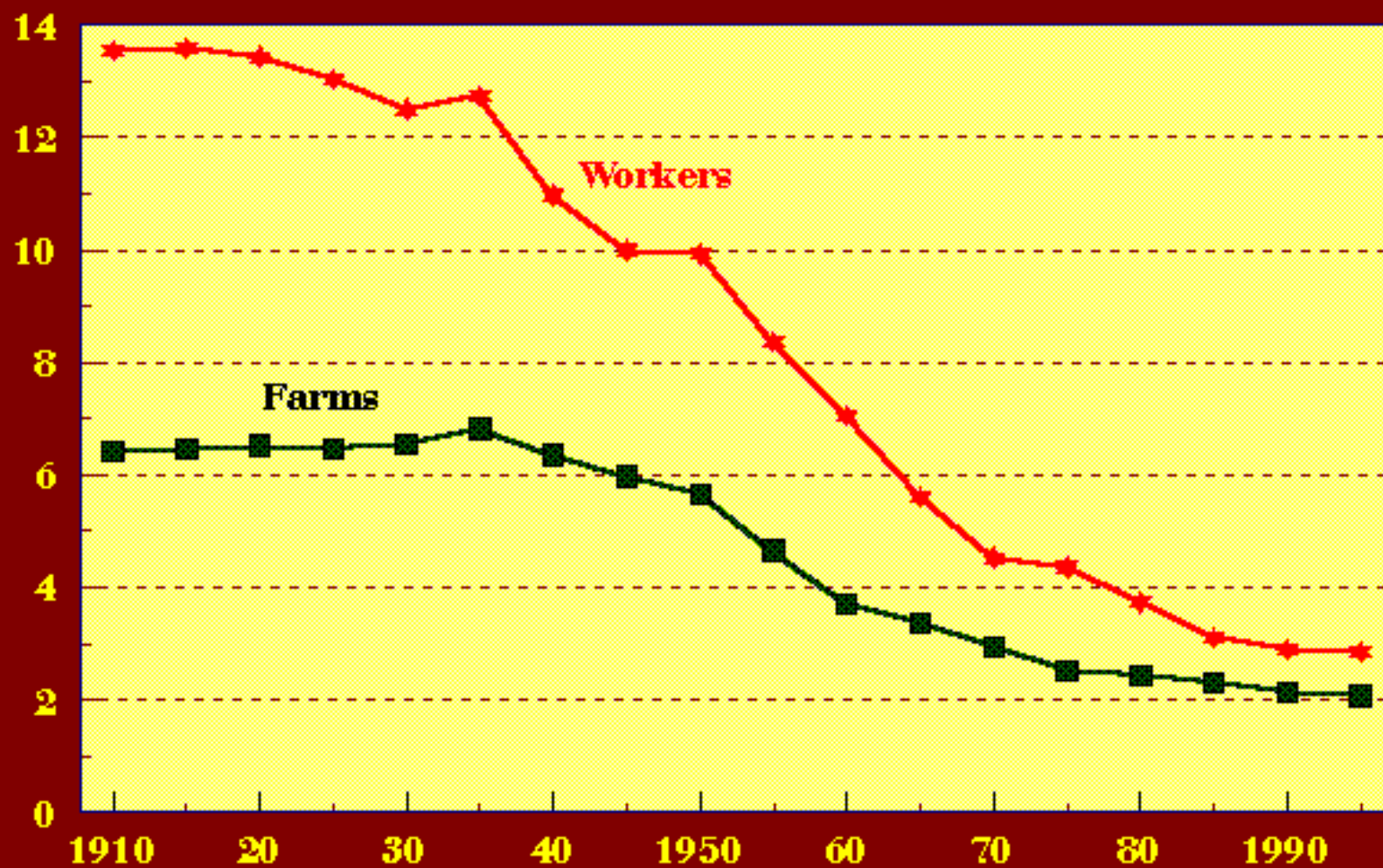


# *7th District Agriculture Products (as % of U.S. total, 2006)*

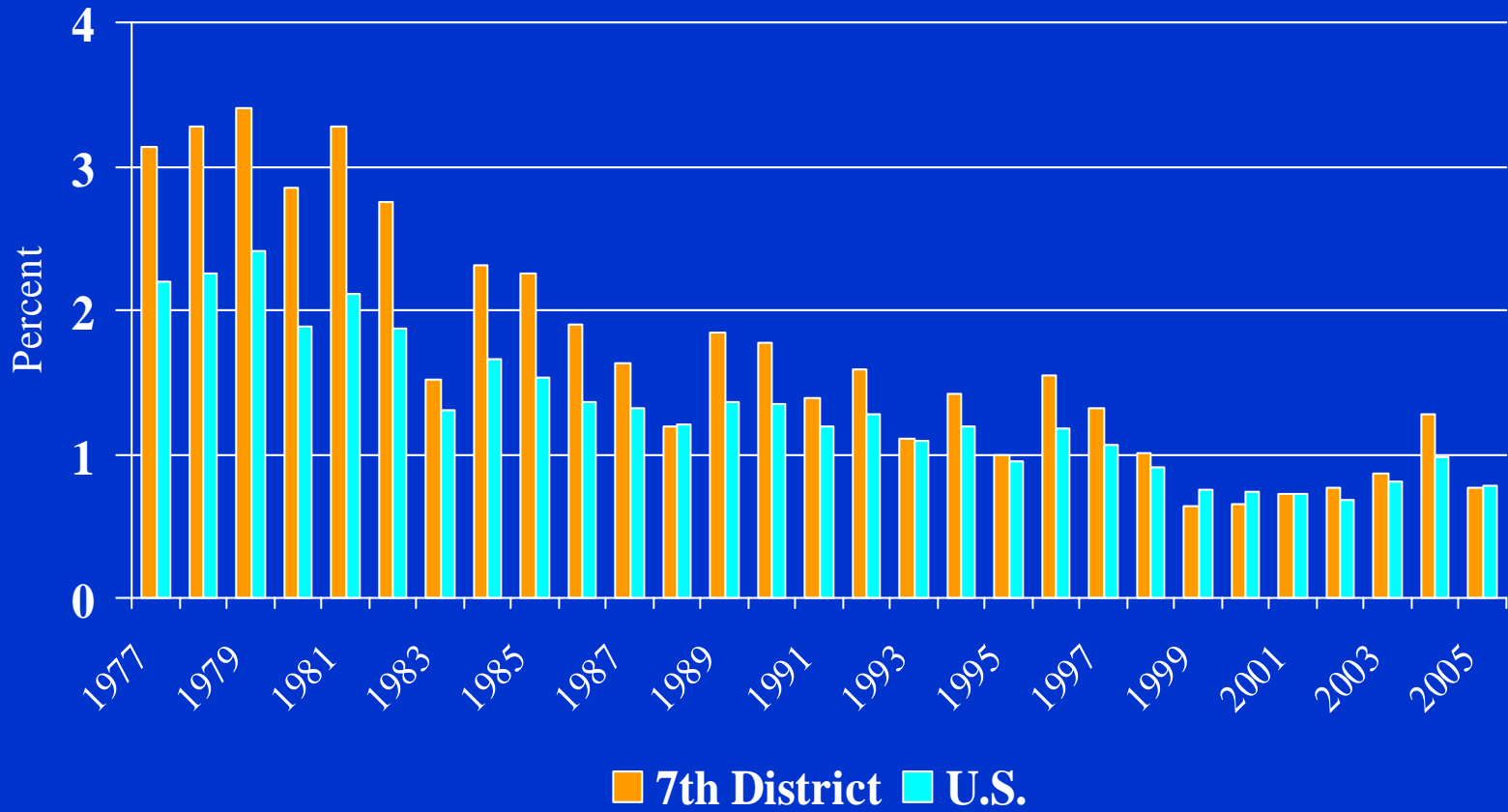


# U. S. Number of Farms & All Farm Workers 1910 - 1995

Millions



# *District and U.S. output shares from farming*



# What a dollar spent for food paid for in 1997

Labor

Packaging

Transportation

Depreciation

Advertising

Fuels and electricity

Before-tax profits

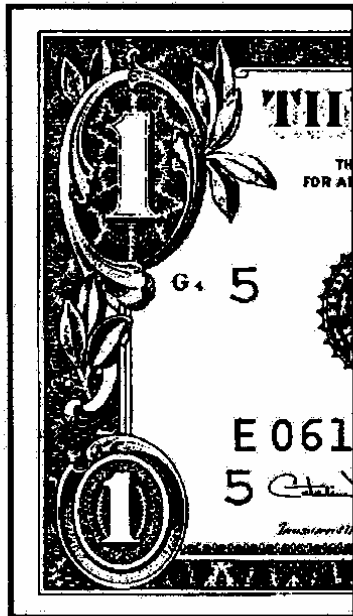
Rent

Interest (net)

Repairs

Business Taxes

Other costs



21¢

Farm value



38.5¢

8.5¢

3.5¢

3.5¢

4¢

3.5¢

4¢

4¢

3.5¢

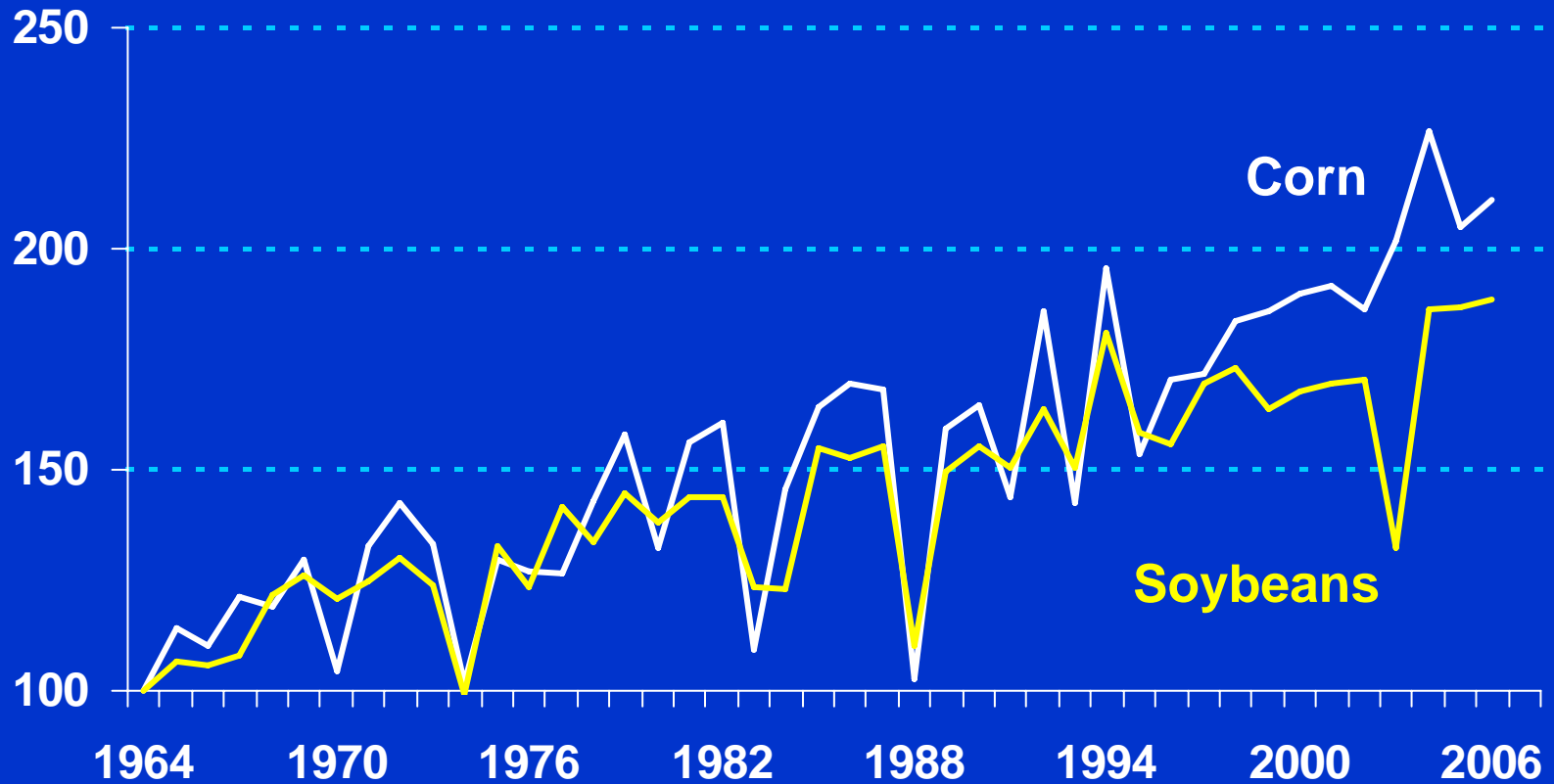
2.5¢

2¢

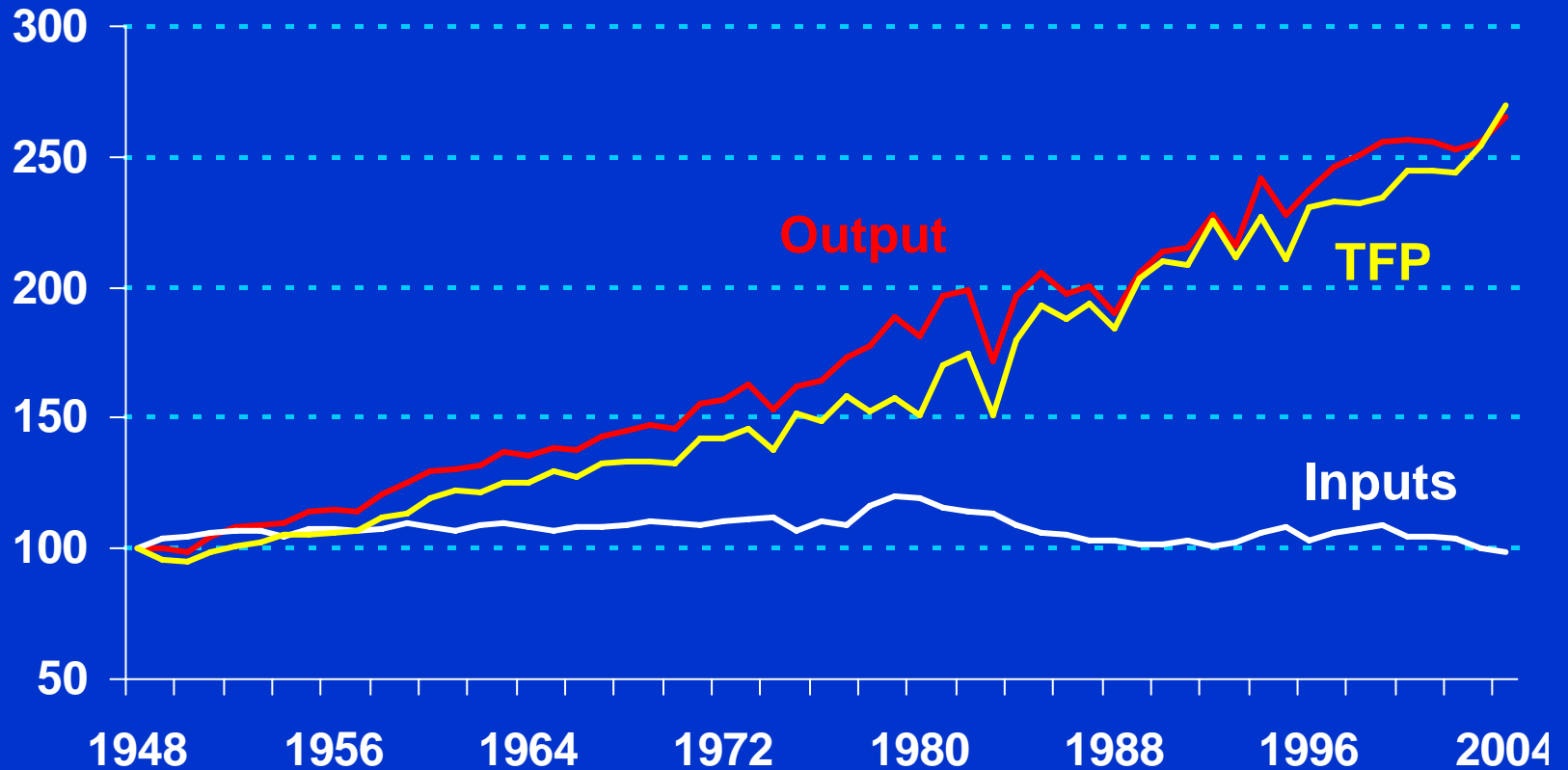
1.5¢

Marketing bill

# 7th District Crop Yield Indexes (1964=100)



# *U.S. agricultural output, inputs, and total factor productivity (TFP)* (1948=100)





# *Shares of growth in agricultural labor productivity*

	<b>1948-1980</b>	<b>1981-2004</b>
<b>Increase in inputs per worker</b>	<b>74</b>	<b>33</b>
<b>Improvements in labor quality</b>	<b>3</b>	<b>1</b>
<b>Growth in TFP</b>	<b>24</b>	<b>66</b>
<b>Total</b>	<b>100</b>	<b>100</b>

# Ag research is vital

- “Policies that affect the longrun rate of productivity growth are more important for the longrun performance of the agricultural sector. These include macro-economic policies that encourage new investment and policies that encourage agricultural research and innovation.”

*Fuglie, MacDonald, and Ball, September 2007*

- “There is a consensus that the payoff from the government’s investment in agricultural research has been high.”

*Fuglie and Heisey, September 2007*

## *Points to Remember*

- U.S. agriculture produces over 2.5 times more with less than 6 decades ago
- Research promotes the long-term health of agriculture (via productivity)
- High returns to research in most commodities
- Significant “spillovers” across state and national boundaries
- Private ag research generates social returns

**For more information check:**

**[www.chicagofed.org](http://www.chicagofed.org)**

**Data Sources:**

**“Productivity Growth in U.S. Agriculture,” (Economic Brief Number 9)**

**Keith O. Fuglie, James M. MacDonald, and Eldon Ball,  
*Economic Research Service, USDA, September 2007***

**“Economic Returns to Public Agricultural Research,” (Economic**

**Brief Number 10), Keith O. Fuglie and Paul W. Heisey,  
*Economic Research Service, USDA, September 2007***

***National Agricultural Statistics Service, USDA***

***Bureau of Economic Analysis, Dept. of Commerce***