

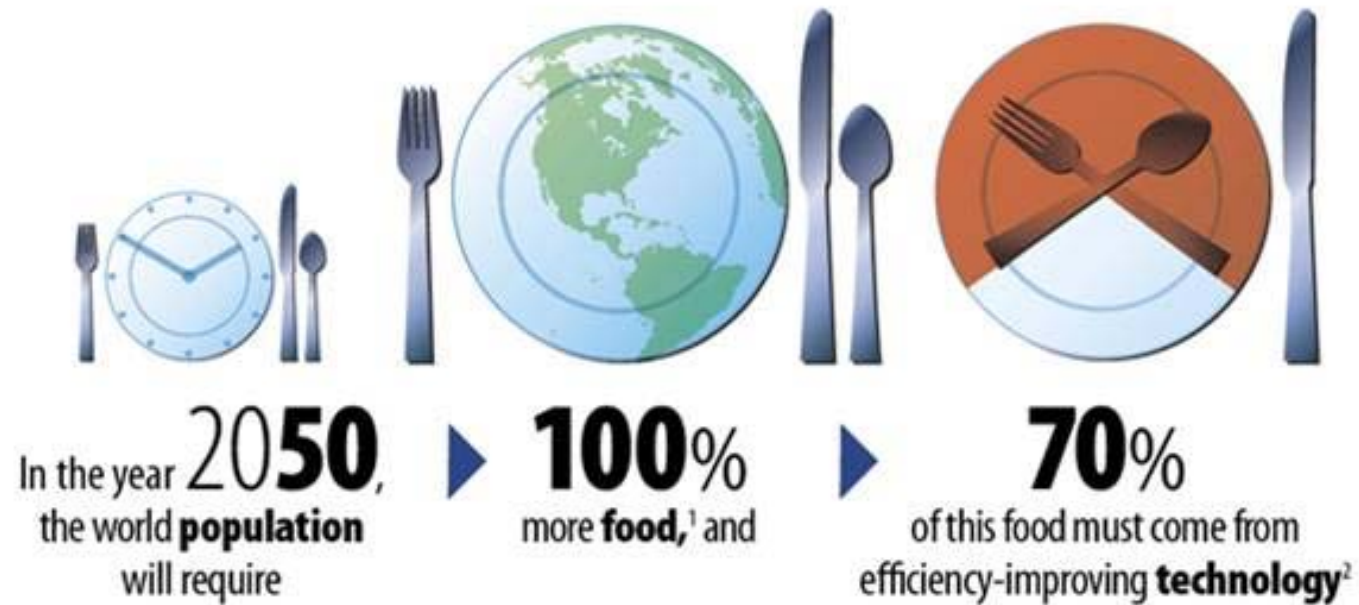
# Cornell CALS

Life-Changing Research, Education and Outreach

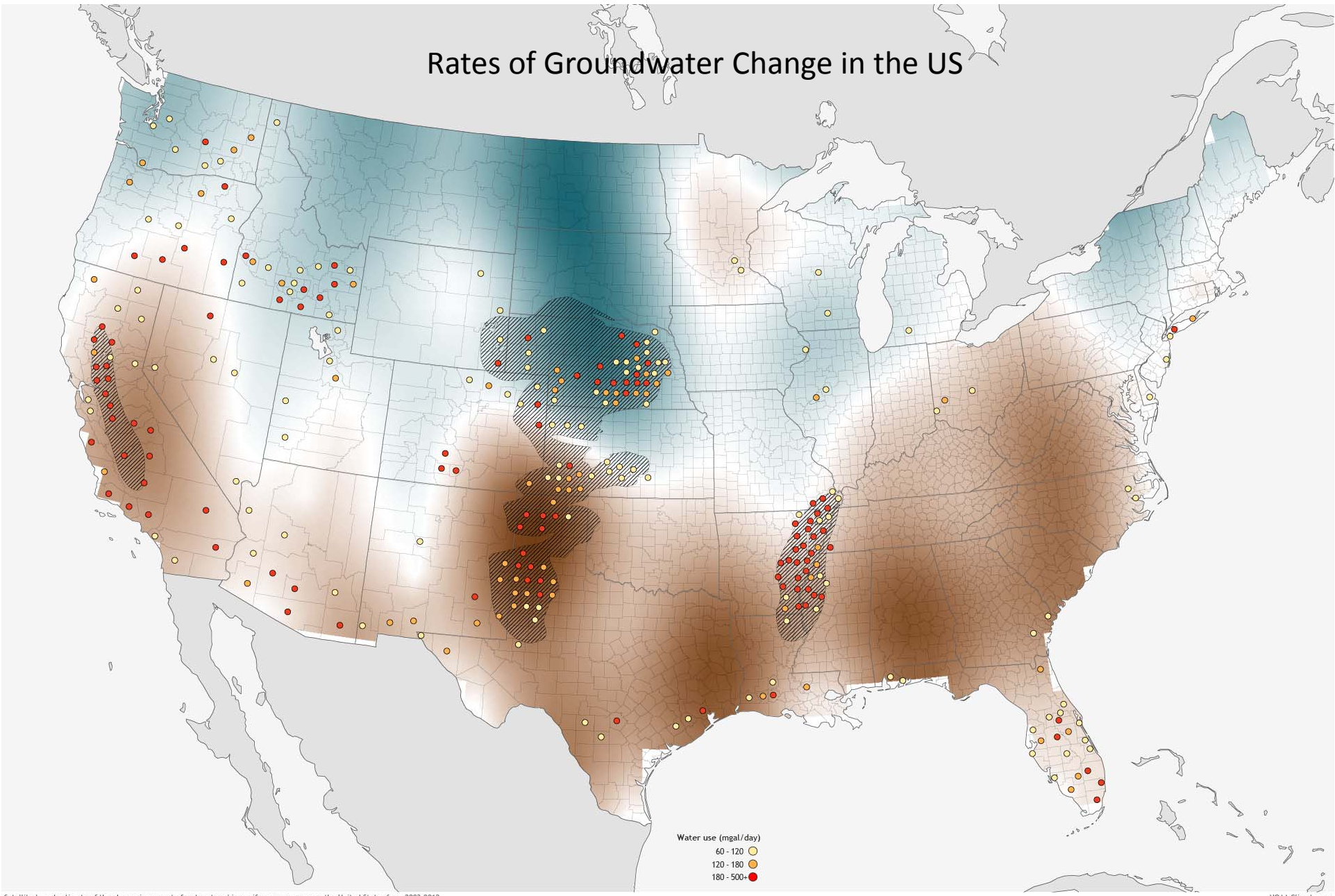


*Julie Suarez  
Associate Dean for Govt. Relations  
College of Agriculture and Life Sciences  
Cornell University*

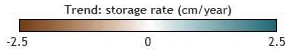
***The Land Grant Mission in 2018: Why R&D innovation in ag matters to farmers & consumers in the future***



# Rates of Groundwater Change in the US



Satellite-based estimate of the change in amount of water stored in aquifers per year across the United States from 2003-2012

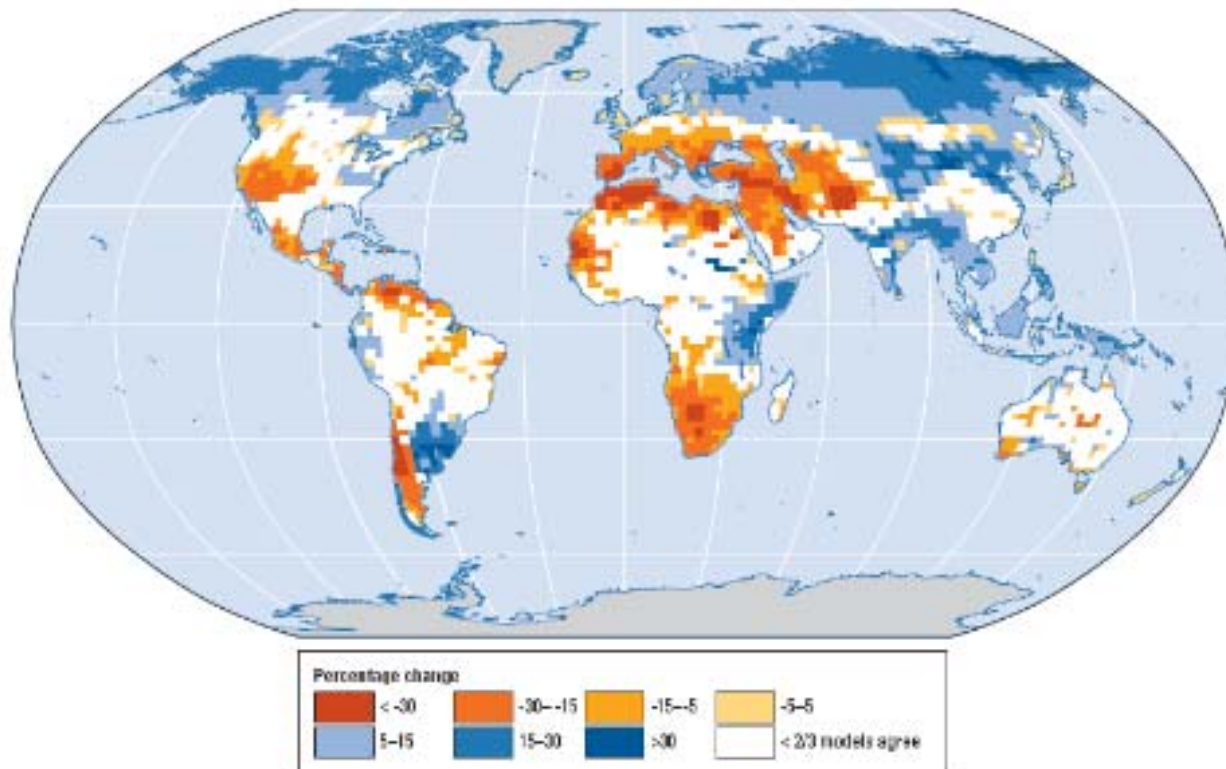


Water use (mgal/day)

- 60 - 120
- 120 - 180
- 180 - 500+

NOAA Climate.gov





# Projections

Source: ClimAid, NYSERDA, DEC

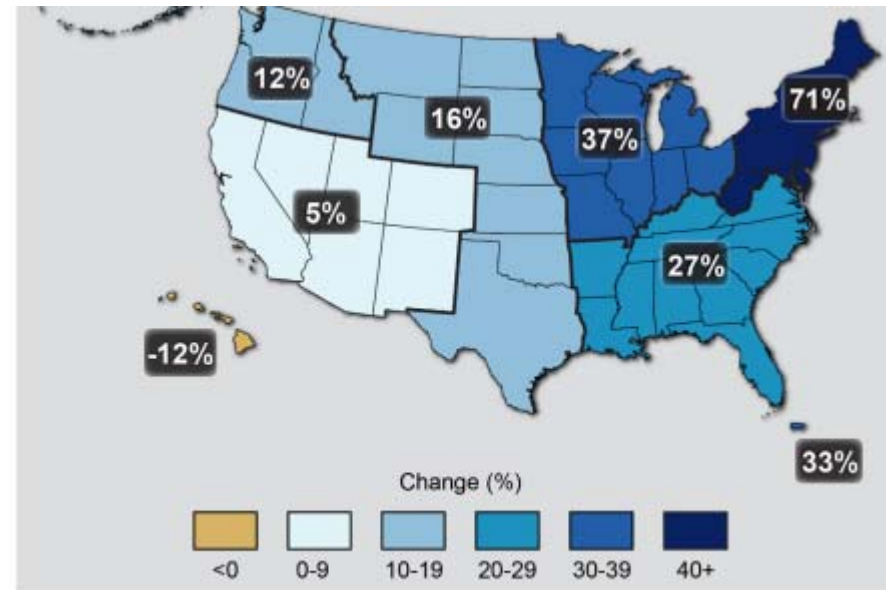
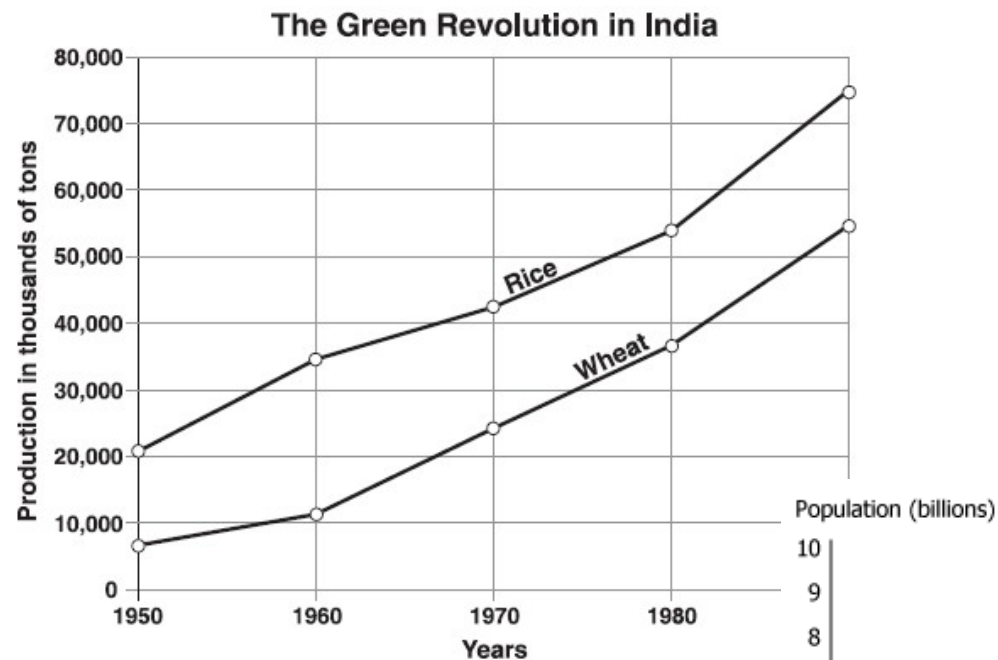


Figure 1. Observed increase in precipitation 1958-2010.<sup>9</sup>

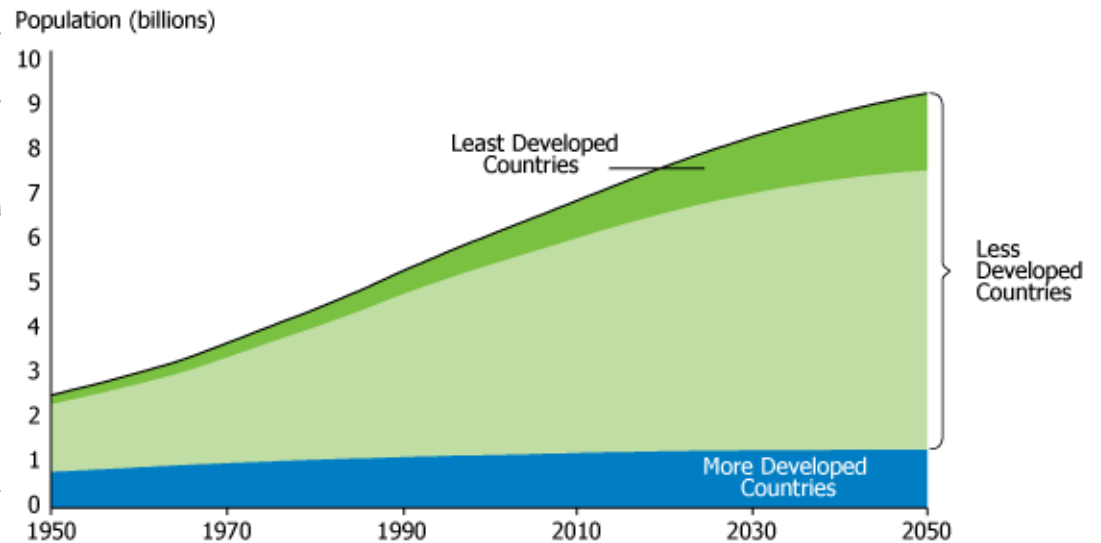
## 7. Saratoga Springs (Region 5). Full range of changes in extreme events: Low Estimate (10<sup>th</sup> Percentile), Middle Range (25<sup>th</sup> – 75<sup>th</sup> Percentile), High Estimate (90<sup>th</sup> Percentile).

	Extreme event	Baseline	2020s	2050s	2080s
Heat Waves & Cold Events	Number of days per year with maximum temperature exceeding				
	90°F	10	14 (17 to 22) 23	22 (27 to 41) 50	27 (35 to 70) 82
	95°F	1	1 (2 to 4) 7	3 (3 to 10) 18	3 (6 to 25) 42
	Number of heat waves per year	1	2 (2 to 3) 4	3 (4 to 6) 7	4 (5 to 8) 9
	average duration	4	4 (5 to 5) 5	5 (5 to 6) 6	5 (5 to 7) 9
Intense Precipitation	Number of days per year with min. temp. ≤ 32°F	155	123 (127 to 136) 139	98 (104 to 119) 125	77 (84 to 109) 120
	Number of days per year with rainfall exceeding				
	1 inch	10	10 (10 to 11) 12	10 (11 to 12) 13	10 (11 to 13) 14
	2 inches	1	1 (1 to 2) 2	1 (1 to 2) 2	1 (1 to 2) 2

# The Next Norman Borlaug?



Source: Library of Congress, Federal Research Division (a



# Why does this matter to your farm?

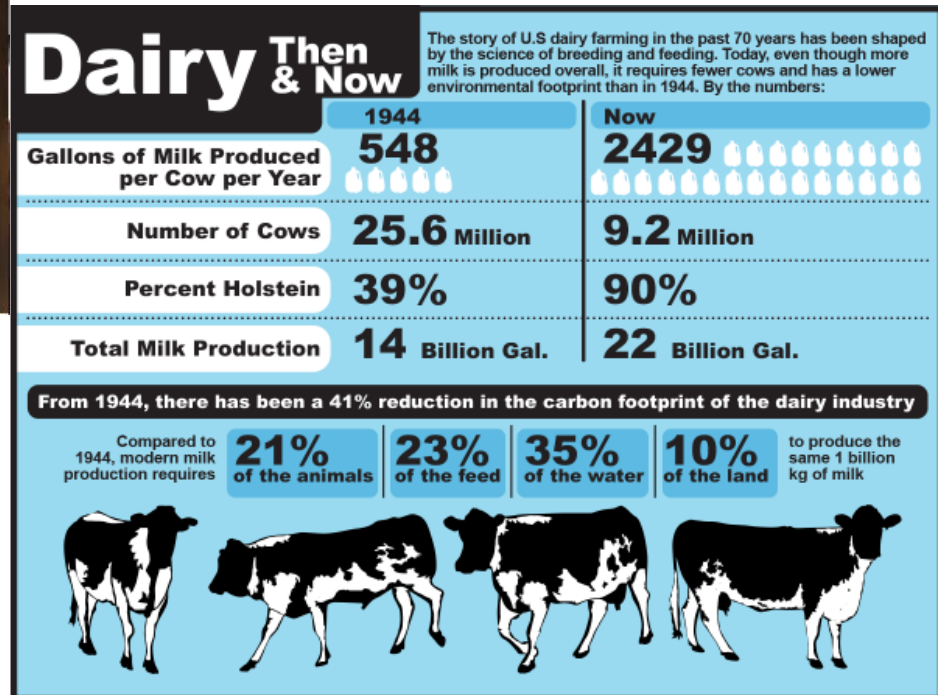


- Assuming favorable free trade conditions, there's a lot of economic opportunity for NY farmers in the coming decades.
- We will have water.
- We will have reasonable weather.
- We will have access to markets.

# But will we have technology?



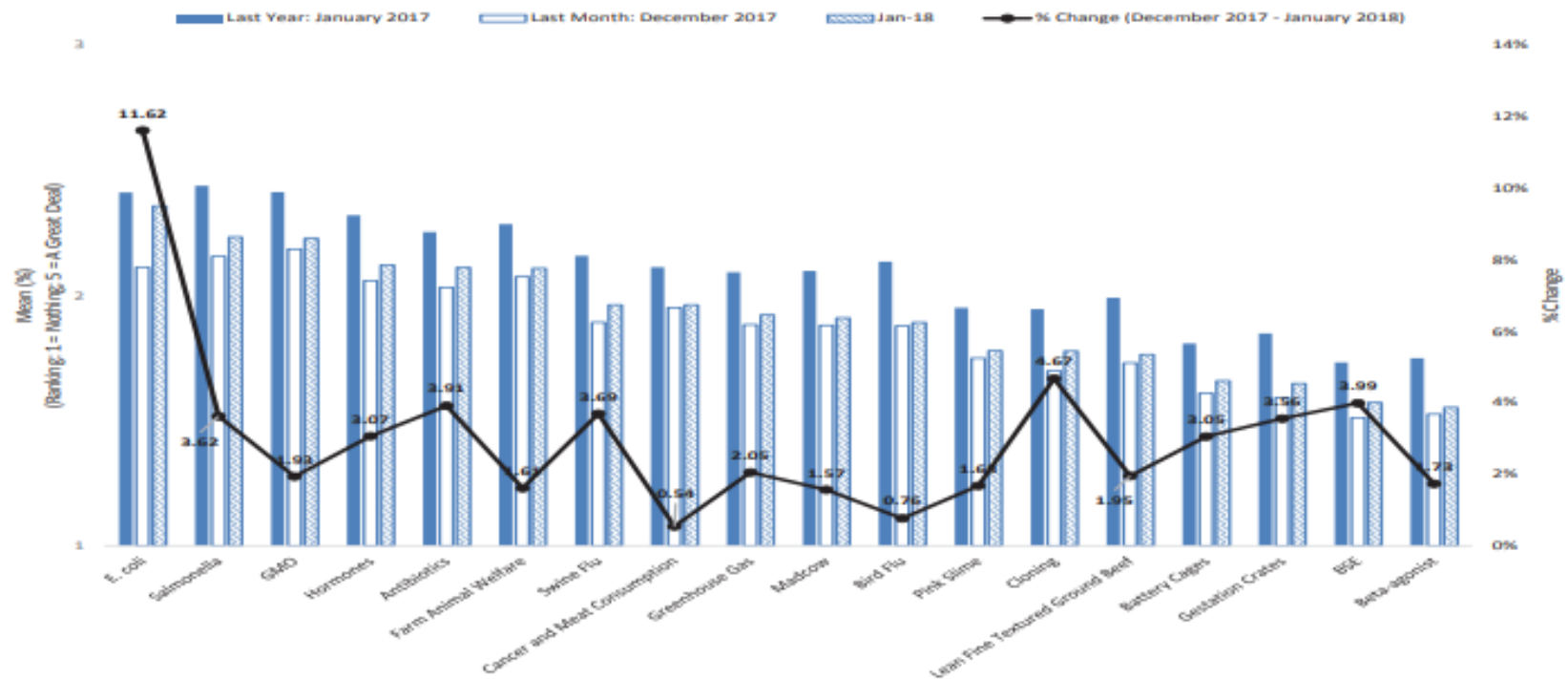
Oklahoma State University survey in 2015 found that 80% of Americans surveyed believed that all foods containing DNA should be labeled.





# Oklahoma State Food Demand Survey - Consumer Concerns

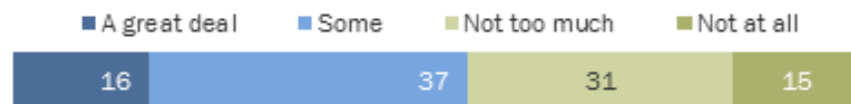
## Awareness of Food Issues





## One-in-six Americans care a great deal about the GM foods issue

% of U.S. adults who say they care \_\_\_\_\_ about the issue of genetically modified foods



Note: Respondents who did not give an answer are not shown.

Source: Survey conducted May 10-June 6, 2016.

"The New Food Fights: U.S. Public Divides Over Food Science"

PEW RESEARCH CENTER



TRANSPARENCY

# Land Grant Foci



- Digital Agriculture
- Plant Breeding
- CEA
- Food Science



# Digital Ag Tools from Cornell



## FARMVIEW

Ever wonder what type of soil your field has on it? Well wonder no longer! Our FarmView lets you find your fields on a map and view soil data, precipitation data and more! Sign up for an account, so you can save your fields for next time as well.

CHECK IT NOW

## JOHN DEERE OPERATIONS CENTER CONNECTED

Ag-Analytics.Org @Cornell Integration with the John Deere Operations Center will allow farmers to securely and seamlessly integrate their precision agriculture data to extract deeper intelligence with the Ag-Analytics risk tools.

INTEGRATE WITH DEERE

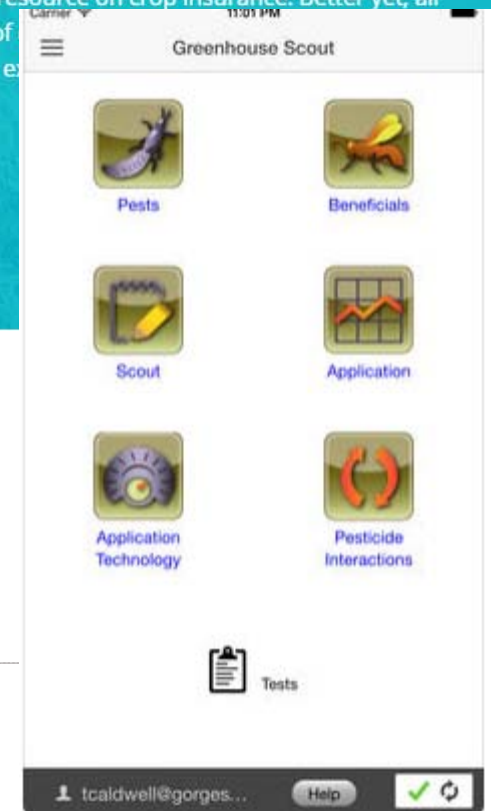


## CROP INSURANCE

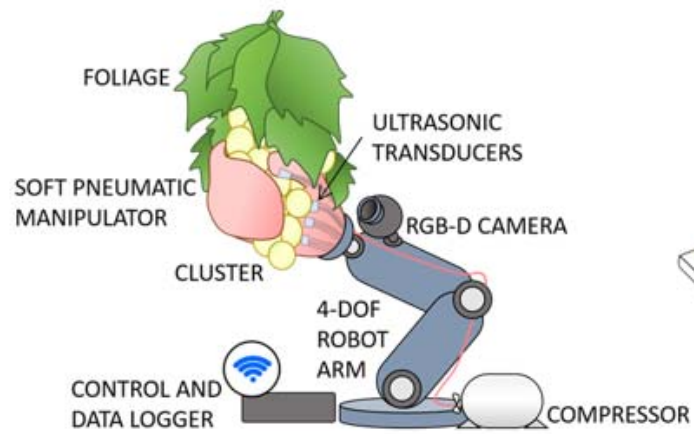
We strive to be your all-in-one information resource on crop insurance. Better yet, all of ex



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## Improving Vineyard Management Using Touch Sensitive Robots

Justine Vanden Heuvel and Kirstin Petersen

# Plant Breeding



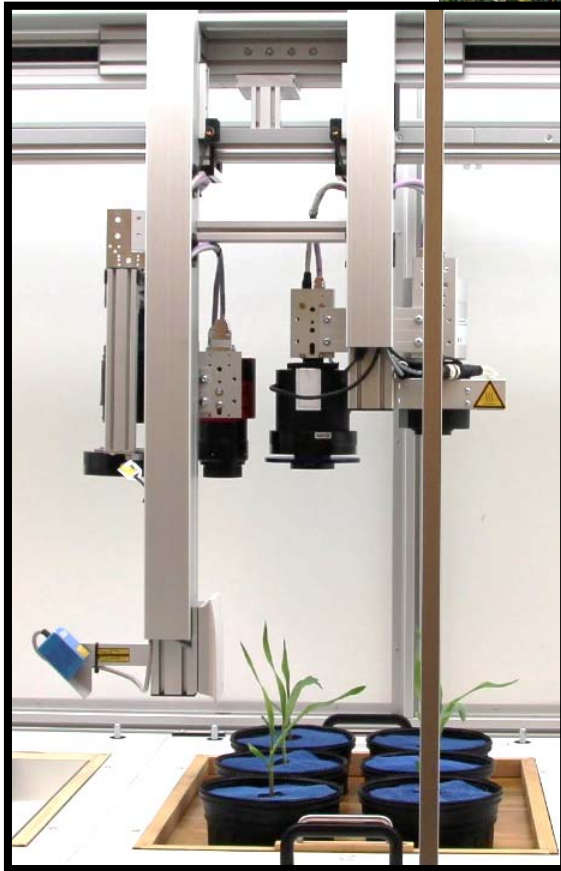
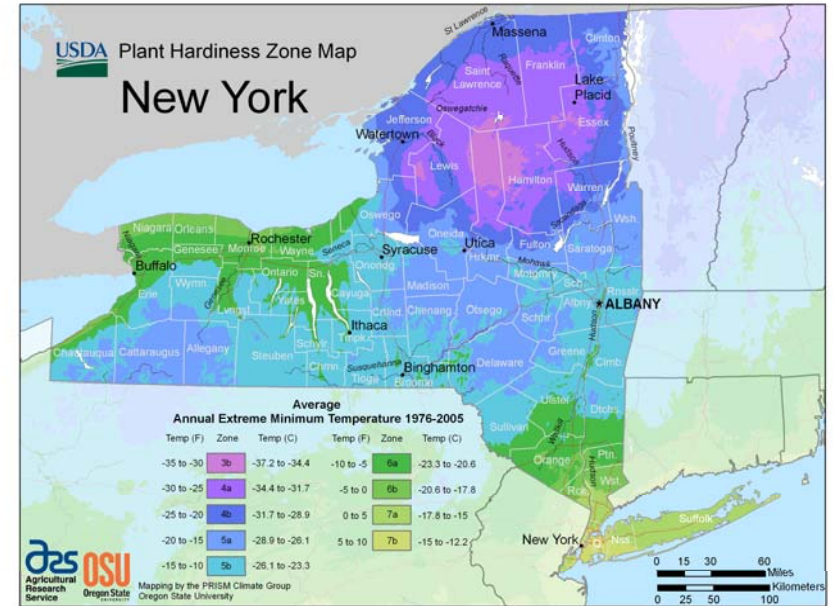
Cayuga  
White –  
1972  
Geneva

Licensed by  
Double A  
Vineyards –  
Fredonia,  
NY

2011  
production  
almost  
2,000 tons,  
2 million  
bottles







# Controlled Environment Ag - CEA



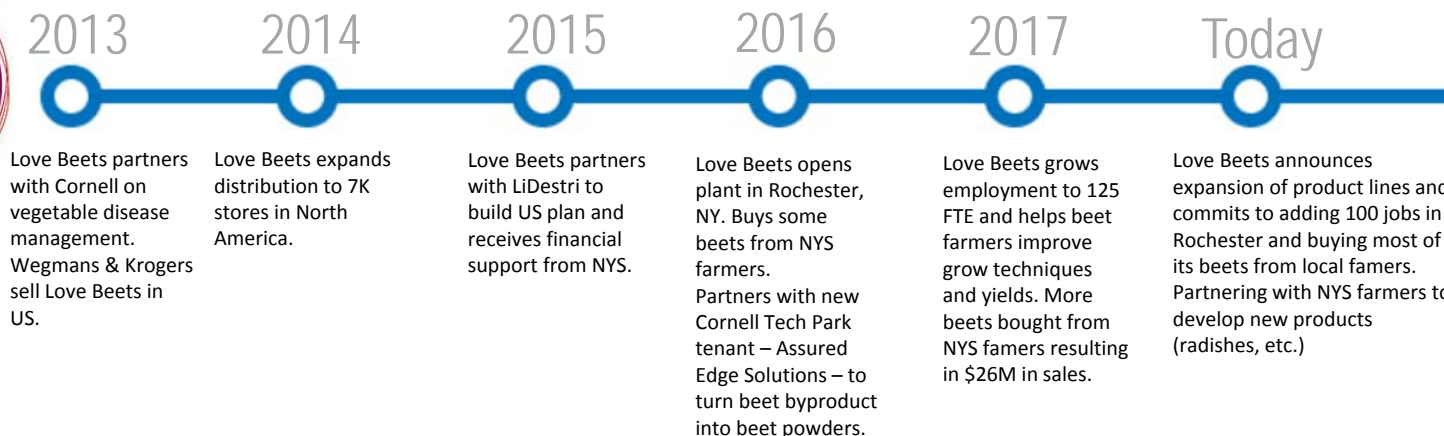
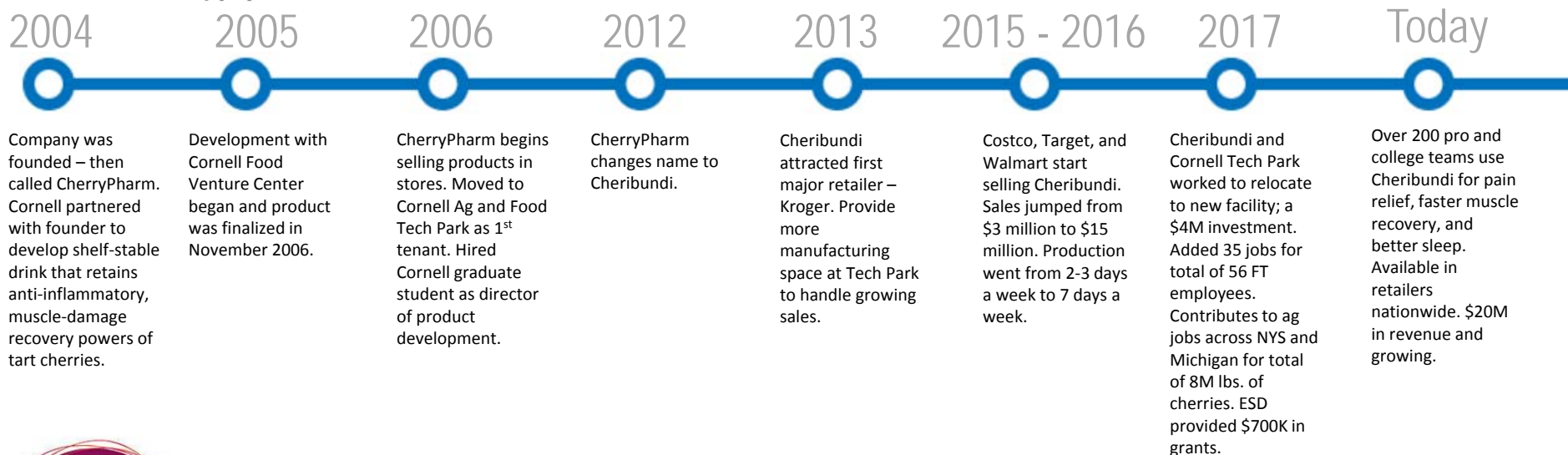


# Food Science Innovation

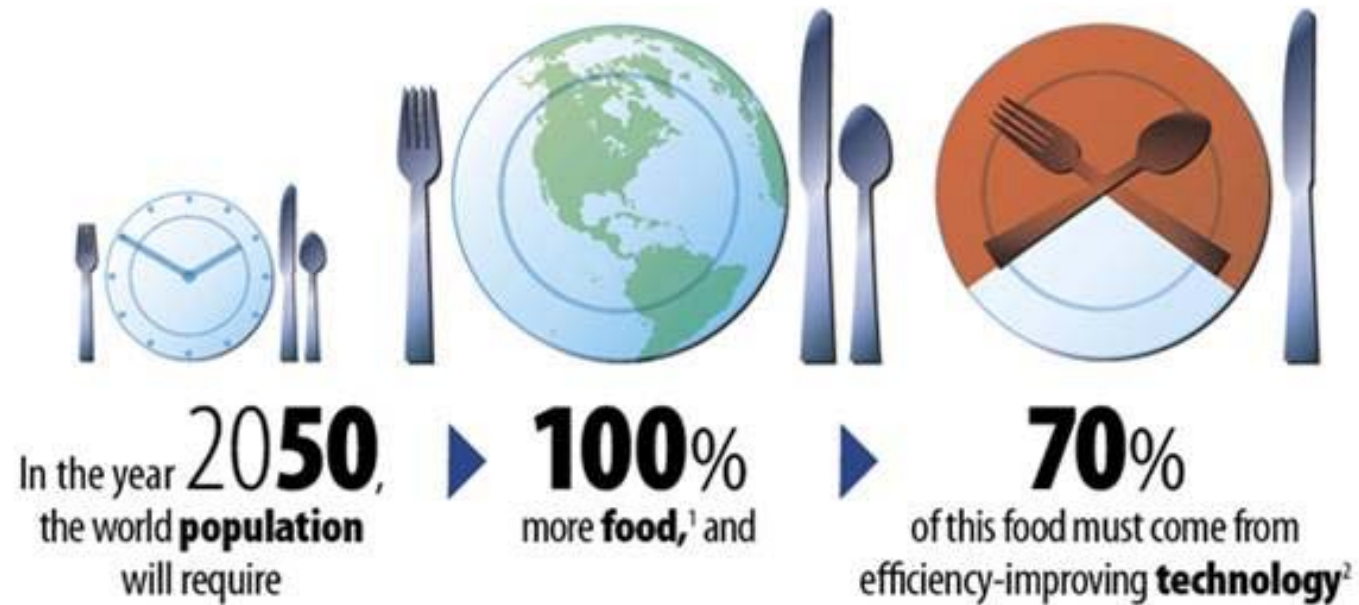


Sam Alcaine, M.S. '07, assistant professor in the Department of Food Science, pours batches of alcohol brewed from acid whey. The various colors are derived from fruit and other natural ingredients added to the beer. Photo by Patrick Shanahan.





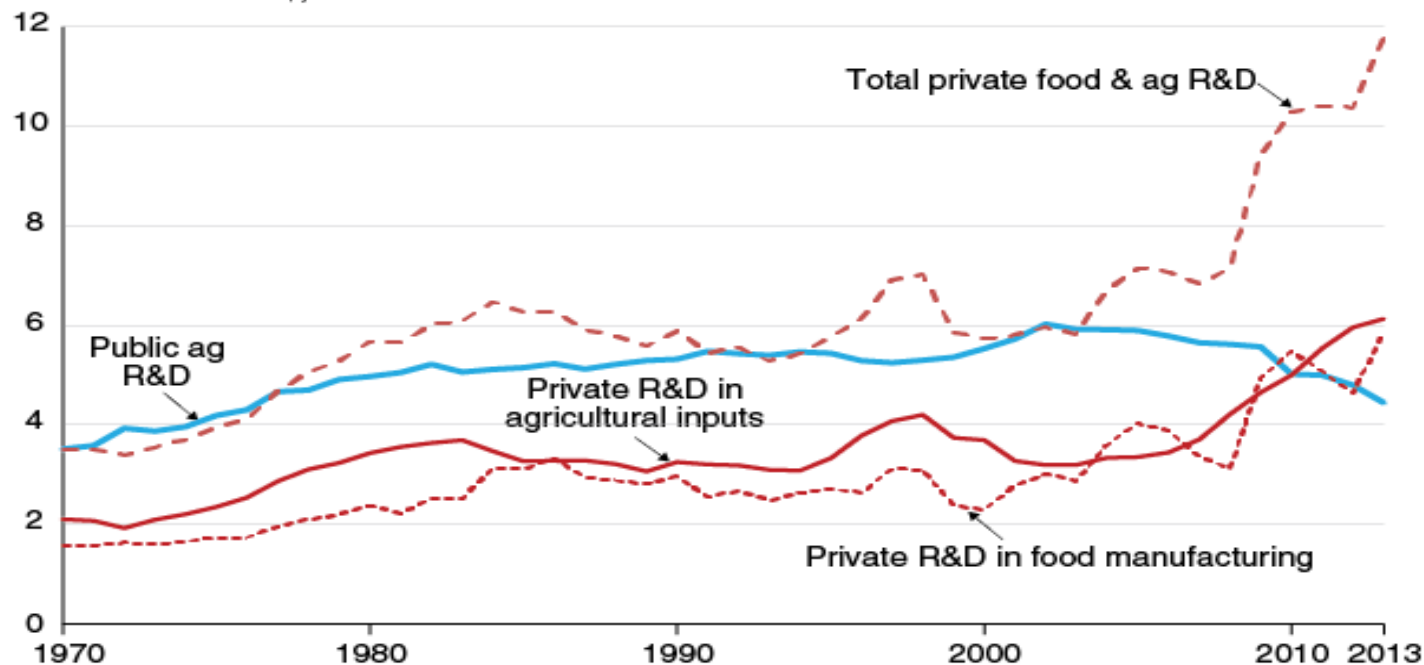
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# Private vs. Public R&D

Private sector and public sector funding of R&D begins to diverge significantly in the early 2000s

Constant 2013 US\$, billions

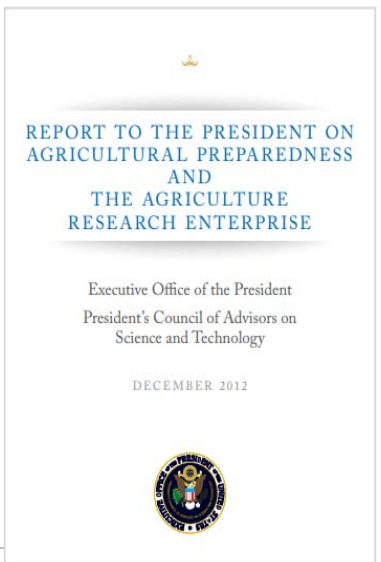


Annual spending on research is adjusted for inflation by a research price index constructed by ERS. R&D = research and development.  
Source: USDA, Economic Research Service.

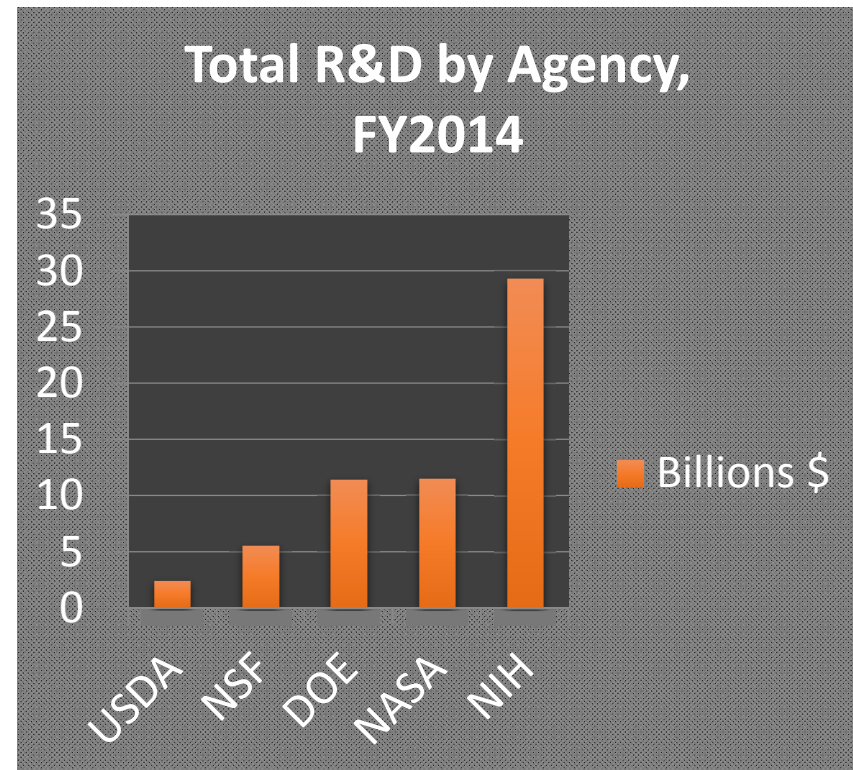
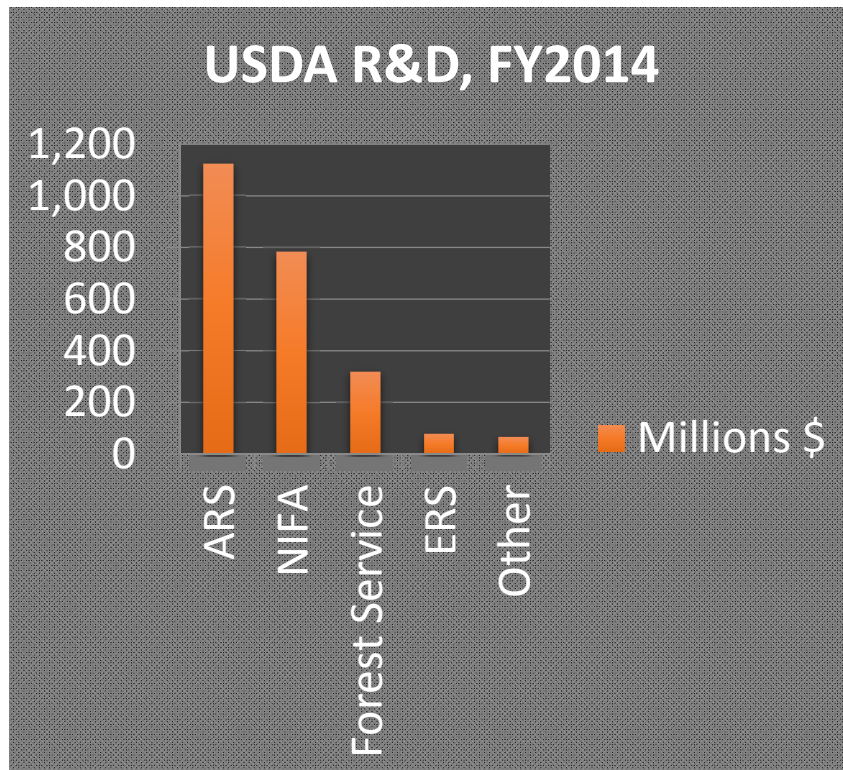


# R&D Trends

- Since 2009 China has been outpacing the US in public spending on Ag R&D
- Brazil and Argentina spend more than US on Ag R&D
- In 2011, for the first time, over half (52%) of the Ag R&D on crop breeding, informatics, fertilizers, pesticides and food tech in rich countries was done by the private sector
- Since 2015 researchers in China have filed for more patent protections/licenses than researchers in the United States (not ag specific)

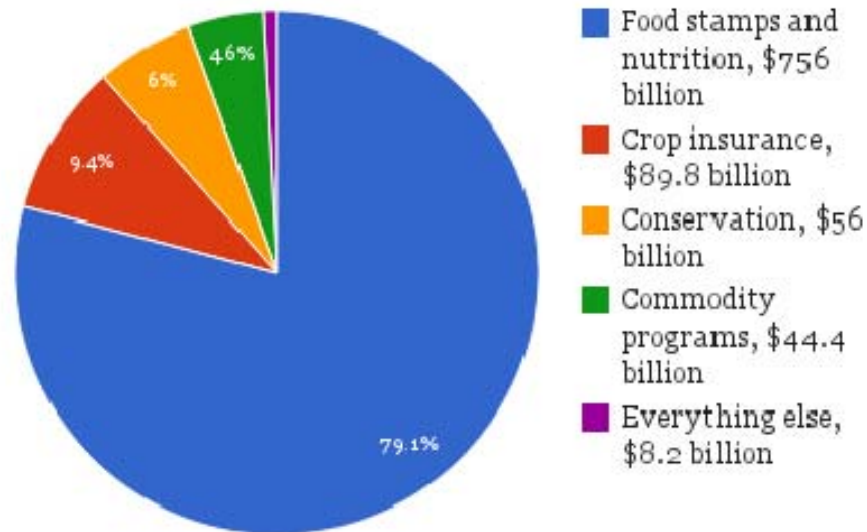


# Less Research = Less Innovation



# R&D represents slightly less than 2% of the last Farm Bill

What's in the farm bill? (Costs from FY2014-2023)



# NYS Matters





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