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United States Department of Agriculture

## Trends in Adoption of Conservation Practices in the United States

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USDA 2022 Ag Outlook Forum  
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*The findings and conclusions in this presentation are those of the author(s) and should not be construed to represent any official USDA or U.S. Government determination or policy. In addition, this work was supported in part by the U.S. Department of Agriculture, Economic Research Service.*

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Conservation tillage  
(No-till/reduced tillage)



Nutrient Management



Cover crops

Photo credits: (1) USDA NRCS Texas; (2) USDA NRCS;  
(3) NRCS/SWCS by Lynn Betts





## Conservation tillage

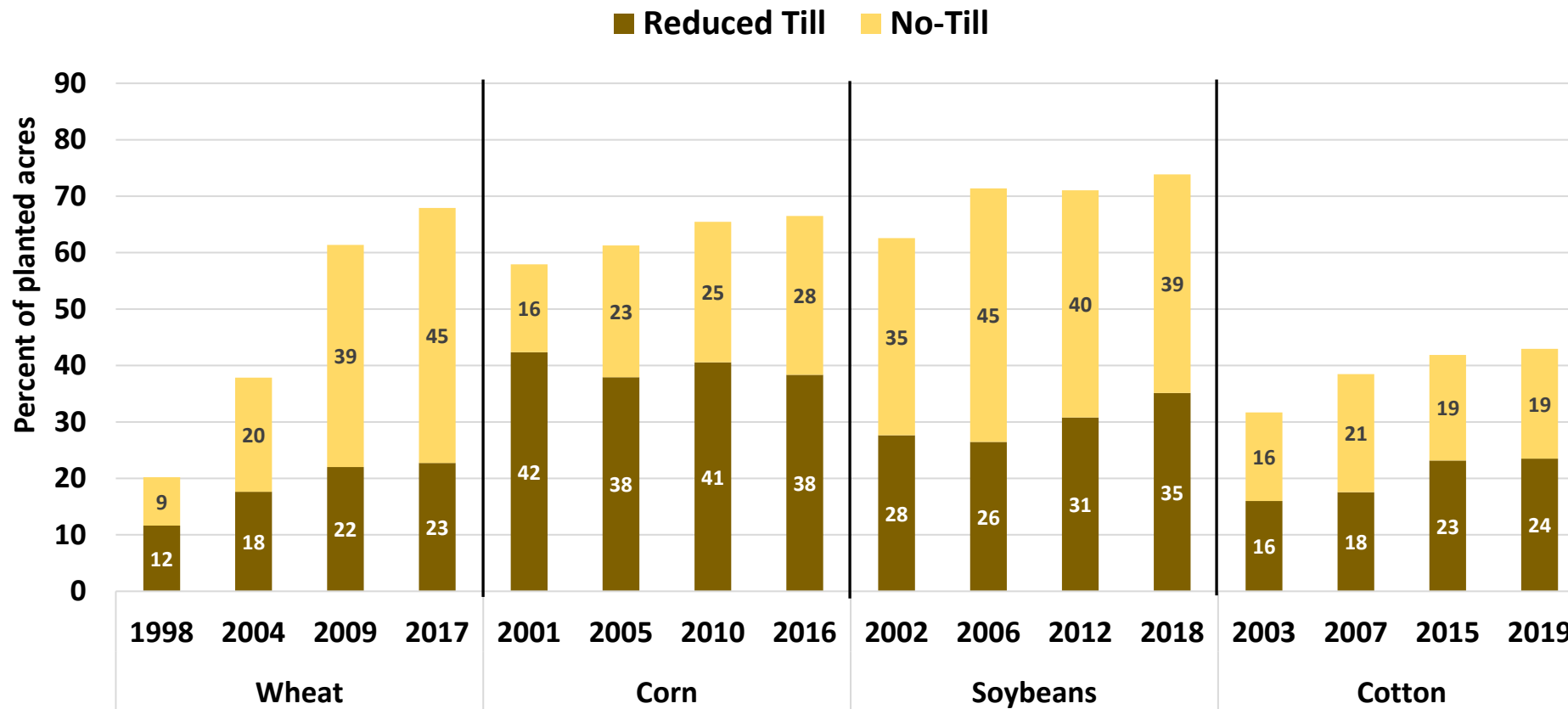
- Tillage has historically played a role in preparing cropland for planting
- Reducing or eliminating tillage has many benefits
- Between 1994 and 2017, the number of acres in no-till expanded from 39 million acres (CTIC) to around 104 million acres (USDA Census of Agriculture)
- A number of factors contributed to this expansion



Photo credit: USDA NRCS Texas



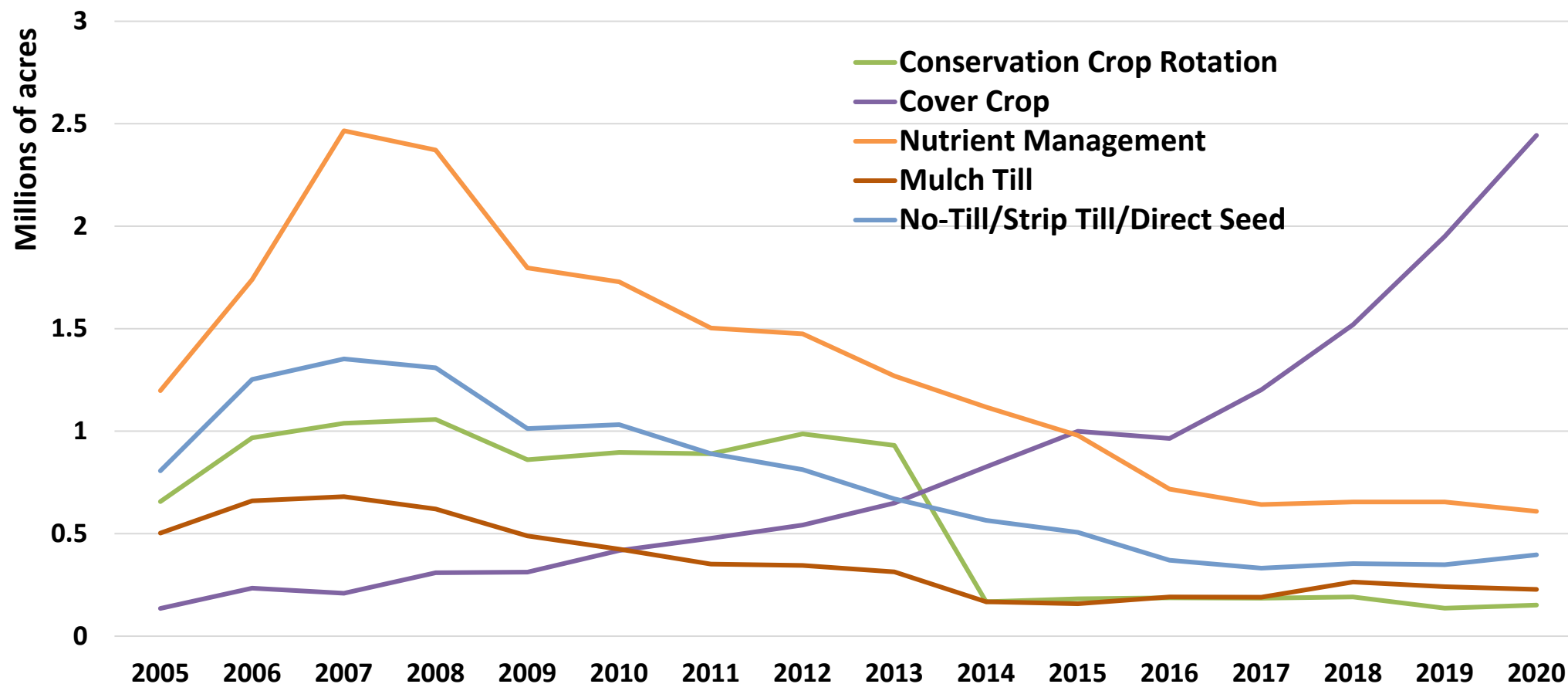
# No-till adoption has slowed for some crops, but total acres under conservation tillage continues to increase



Source: USDA, Economic Research Service and USDA, National Agricultural Statistics Service, Agricultural Resource Management Survey



## Financial assistance through EQIP for top cropland management practices



Source: USDA-NRCS, National Planning and Agreements Database (NPAD), October 2020 via USDA-NRCS RCA Data Viewer.





## Cover crops



NRCS/SWCS photo by Lynn Betts

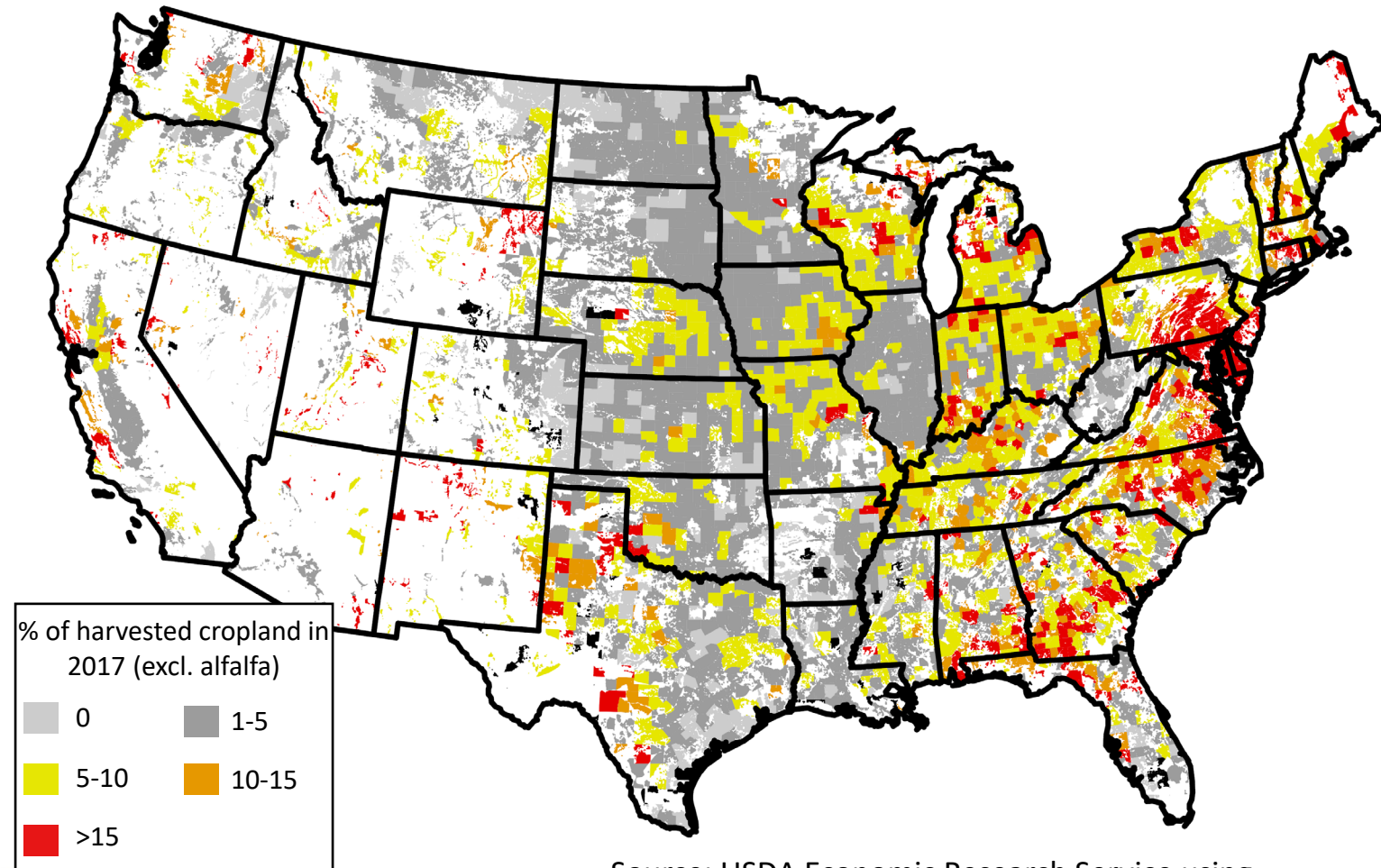
- Cover crops can provide a number of benefits
- Adoption is increasing across the U.S. (10 million acres in 2012 census vs. 15 million acres in 2017 census)
- ERS data suggest that this trend is continuing
- Adoption still (relatively) low compared to conservation tillage





## Adoption of cover crops varies across the U.S.

- Different soils, cropping and livestock systems, and climate all affect costs and benefits of cover crop adoption
- Cover crops relatively cost-effective for addressing water quality concerns
- State programs and financial incentives for cover crops play a role

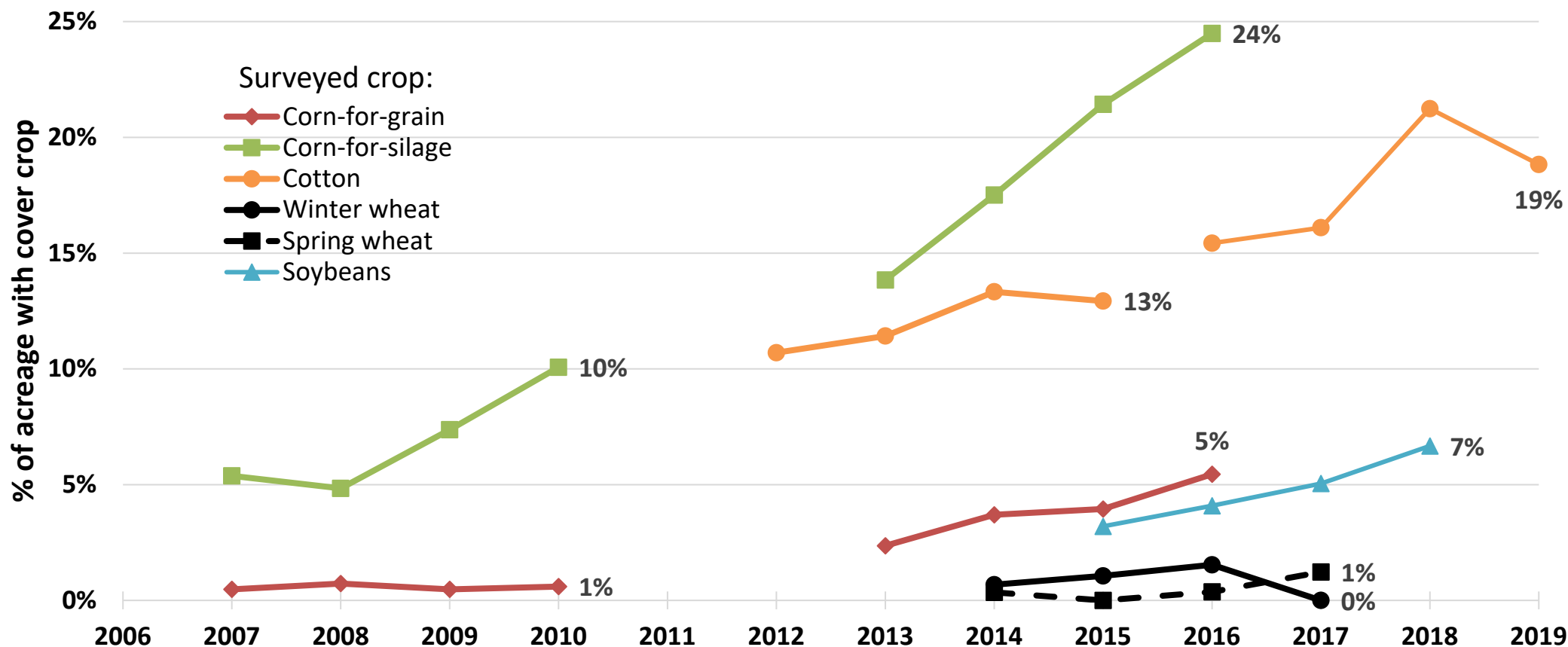


Source: USDA Economic Research Service using data from the 2017 Census of Agriculture





## Rates of fall cover crop adoption vary depending on the cash crop



Source: USDA, Economic Research Service and USDA, National Agricultural Statistics Service, Agricultural Resource Management Survey





Photo credit: Jason Johnson, Iowa NRCS

## Nutrient management

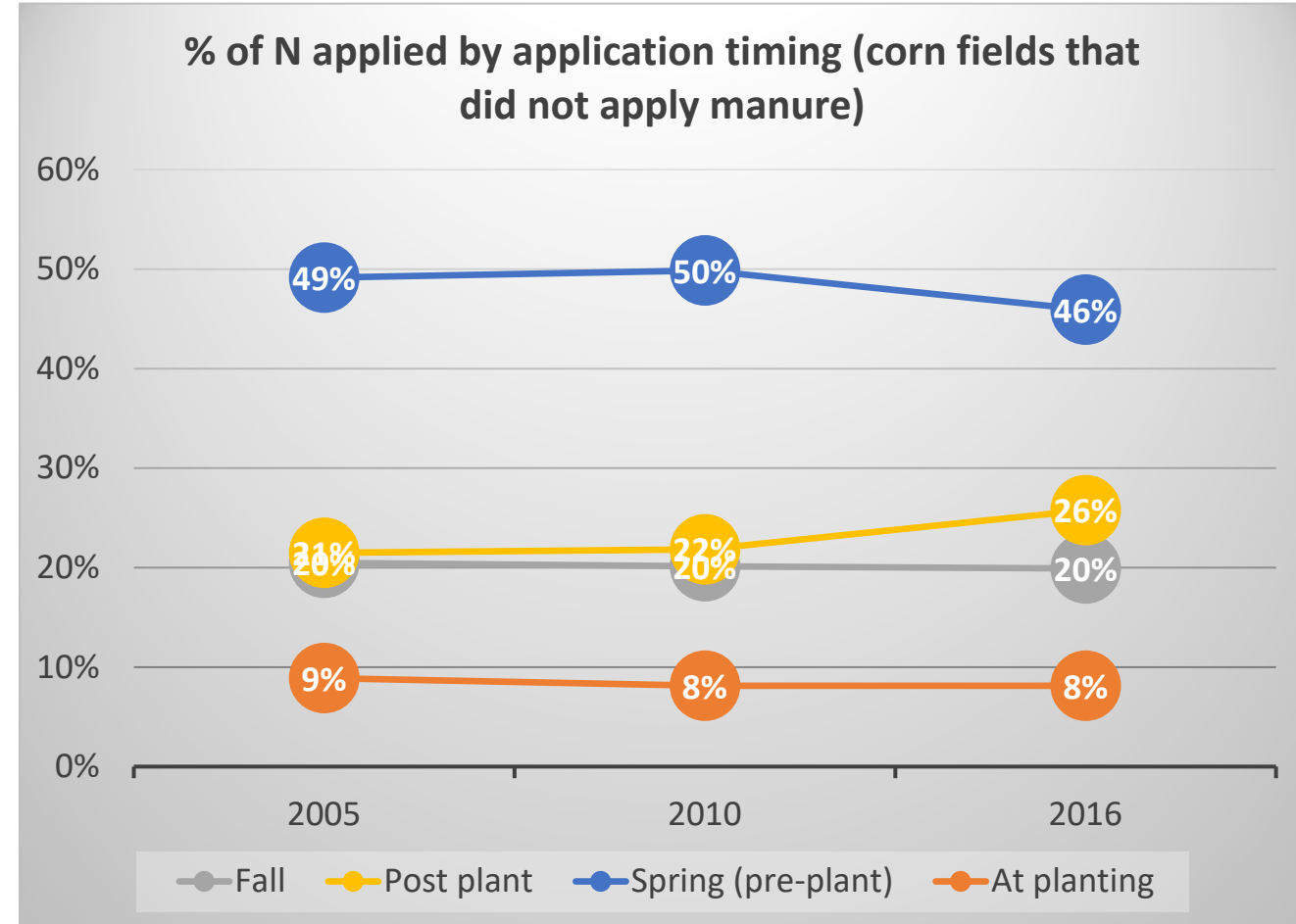
- Crop growth and environmental impacts of nutrient management affected by...
  - Amount (rate) of nutrients applied
  - Source of nutrients
  - Timing and placement of nutrients
- Examples of conservation at work in nutrient management:
  - No fall application, or “split application”
  - Aligning rate of nutrients applied with crop needs or profit-maximizing rate (not over-applying)
  - Using soil test results to help determine application rates





# Nutrient management trends over time

- In general, share of acreage w/ application rates >125% of agronomic need has decreased (N & P)
  - Nitrogen on corn: 53% in 1997 vs. 28% in 2016
  - Phosphate on cotton: 45% in 1997 in to 29% in 2015
- When and how nutrients are being applied is changing
  - In corn, some evidence that spring application is shifting from pre-plant to post-plant
  - Will be examining trends for other crops, fields receiving manure
- What role does precision nutrient management play in conservation, and how is this changing over time?



Source: USDA, Economic Research Service and USDA, National Agricultural Statistics Service, Agricultural Resource Management Survey





## Tillage Intensity and Conservation Crop Rotation in the United States

Roger Craswell  
Maria Bowman  
Jonathan McEadden  
David Smith  
Steven Wallander



## Cover Crop Trends, Programs, and Practices in the United States

Bowman,

Steven Wallander, David Smith, Maria B  
and Panov, Roger Craswell



## Agricultural Resources and Environmental Indicators, 2019

and Richard K. Anderson, Maria B. Bowman, Steven Wallander, David Smith, and Daniel Hellerstein, Dennis Wilkerson, and Me



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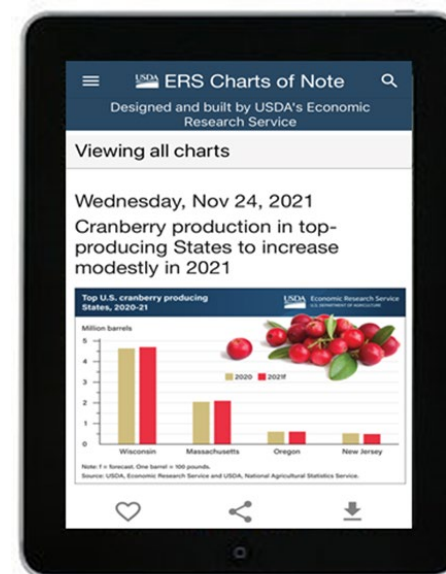


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# Thank you.

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