Land Tenure and Conservation: What drives Landowner's Conservation Decisions?

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Iowa Agriculture & Water Alliance Advisory Council
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A Quick Introduction: Dr. Wendong Zhang

– Grown up in a rural county in NE China
– Attended college in Shanghai and Hong Kong
– Ph.D. in Ag Econ in 2015 from Ohio State
– 2012 summer intern at USDA-ERS on farm economy and farmland values
– Research and extension interests:

land value/ownership www.card.iastate.edu/farmland/

agriculture and the environment

China Ag center www.card.iastate.edu/china

Harmful Algal Blooms (HABS) more severe since 1995

Blooms largely caused by Phosphorus, DRP doubled since 1995

Maumee River contributes 50% of Phosphorus and drives HAB severity

Detroit

Windsor

Maumee Bay

Lake Erie

Toledo

Cleveland

N 25 miles 40km

Image: NOAA

Image: www.underwatertimes.com

GLWQA nutrient reduction target

2016 Great Lakes Water Quality Agreement Protocol, Annex 4 **Spring** (March-July) Targets

Maumee River Watershed

	Maumee Watershed	Western Lake Erie
Dissolved Reactive P (**DRP**)	186 MT	**40% less**
Total P (**TP**)	860 MT	**40% less**

Baseline Load Year: 2008

- Can we achieve these targets? How? What is the most efficient policy?

Multiple models guide strategies for agricultural nutrient reductions

Donald Scavia[1*], Margaret Kalcic[1,2], Rebecca Logsdon Muenich[1], Jennifer Read[1], Noel Aloysius[2], Isabella Bertani[1], Chelsie Boles[3], Remegio Confesor[4], Joseph DePinto[3], Marie Gildow[2], Jay Martin[2,8], Todd Redder[3], Dale Robertson[5], Scott Sowa[6], Yu-Chen Wang[1], and Haw Yen[7]

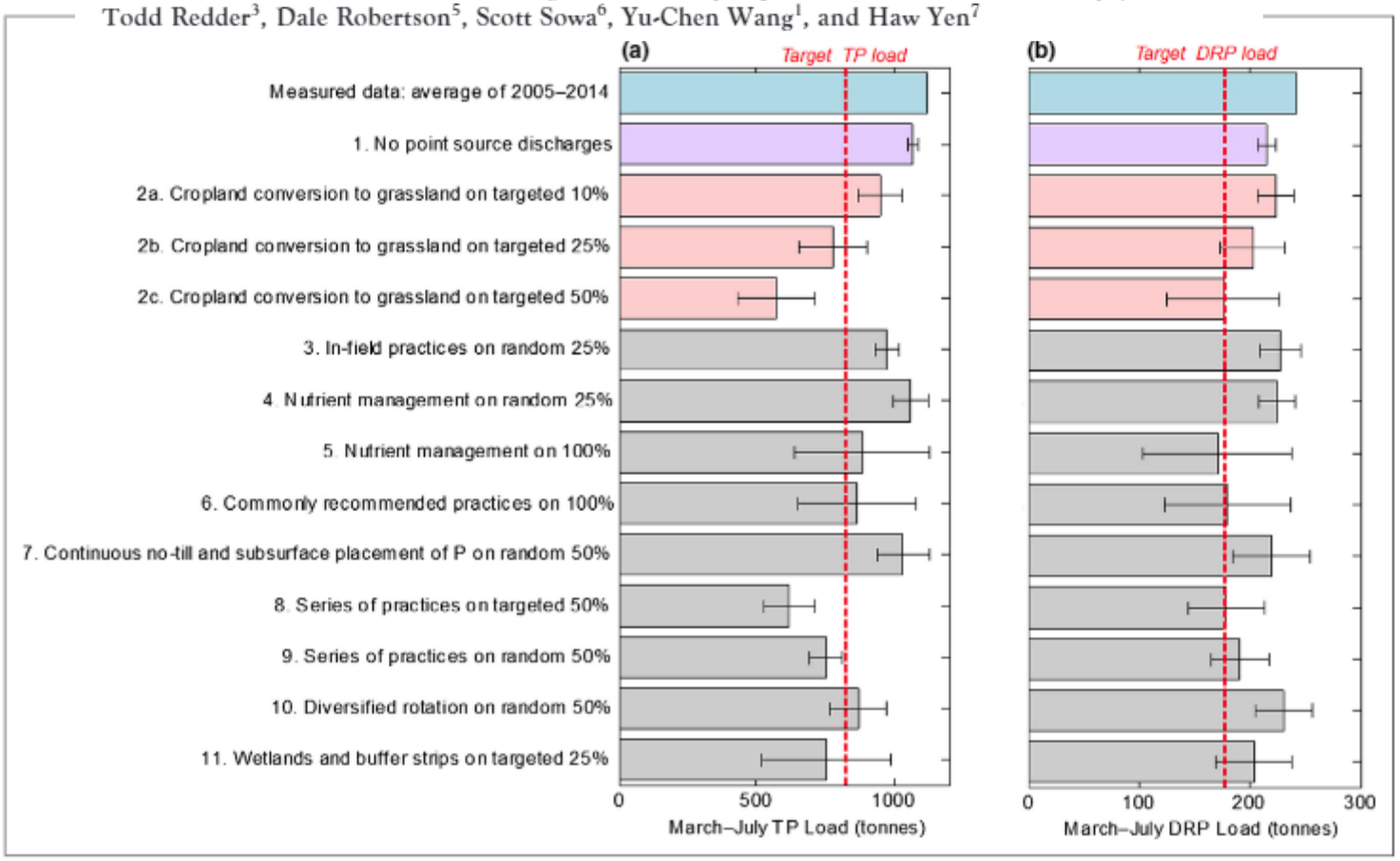
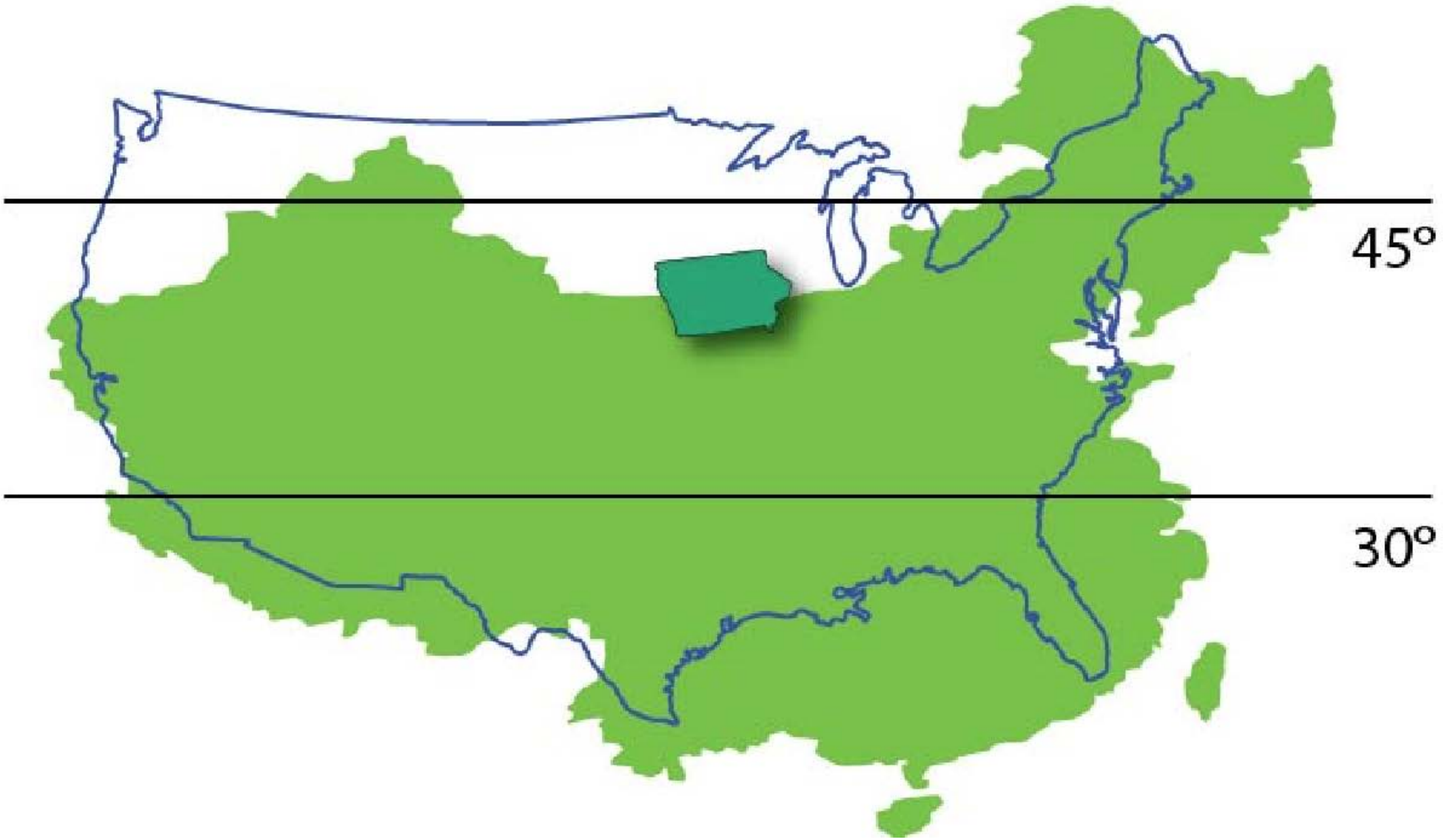


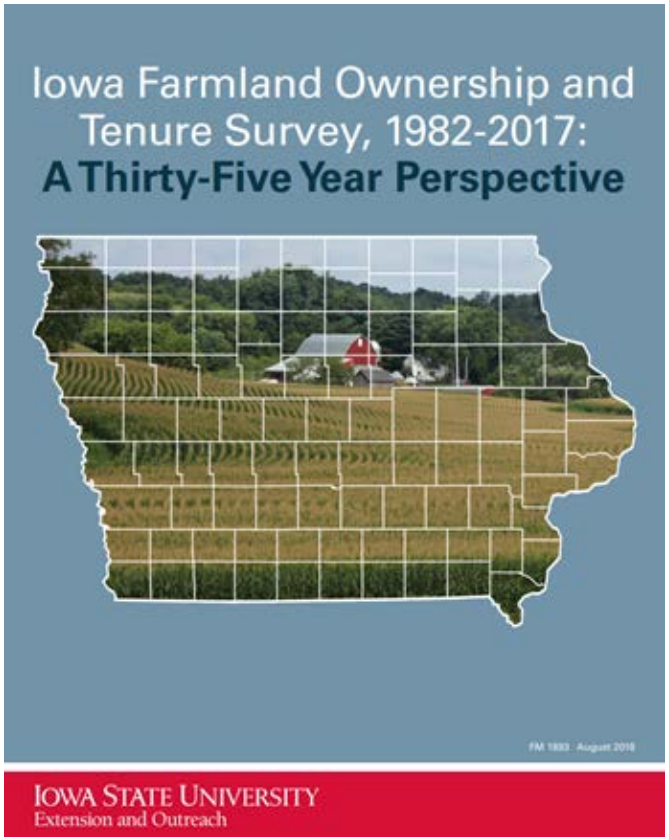
Figure 3. *Weighted average and 95% confidence intervals of the five SWAT models' March–July TP (a) and DRP (b) loads during the 2005–2014 modeling time period. The average observed March–July loads (area-weighted to Waterville, Ohio gage station) from 2005 to 2014 are represented in the top bars and the GLWQA target loads are depicted by the dashed red lines. Scenario 1 is the result of removing all point-source discharges; Scenarios 2a–c show a dose response as to how much land would need to be converted to grassland in order to meet the targets without going beyond current agricultural conservation measures; Scenarios 3–11 demonstrate the effect of implementing more agricultural conservation. DRP = dissolved reactive phosphorus; GLWQA = Great Lakes Water Quality Agreement; P = phosphorus; SWAT = Soil and Water Assessment Tool; TP = total phosphorus.*

Mainland China vs. US



Daily Mail

Tourists frolic in SEAWEED that has covered beaches in eastern China ...



- 82% of Iowa land is debt-free
- 60% of land owned by owners 65+ years old, one-third of land owned by 75+ years old, 13% of land owned by women landowner 80+ years old
- Ownership continues to shift from sole ownership to trusts and corporations
- 53% of Iowa land rented out – mainly cash rent
- 34% of Iowa land owned by landlords with no farming experience, 23% of land owned by retired farmers who do not currently farm
- 29% of Iowa land owned primarily for family/sentimental reasons

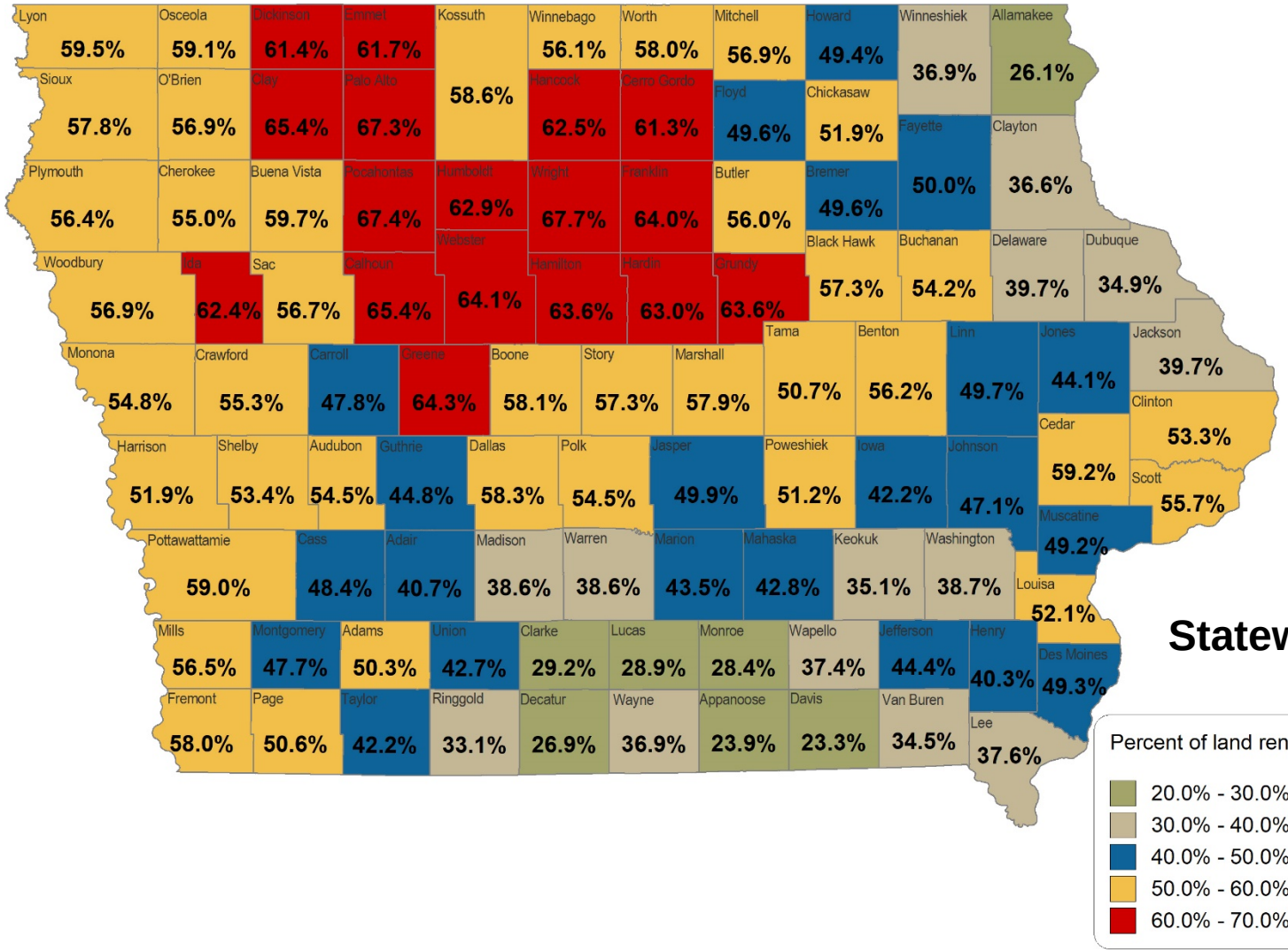
($5 each print copy!)

https://store.extension.iastate.edu/product/6492

Iowa Farmland Ownership and Tenure Survey – history and methodology

- **The first and only consistent data collection of land ownership & tenure in the nation**:
  - 1949, 1958, 1970, 1976, 1982, 1992, 1997, 2002, 2007, 2012, **and 2017**.
- **Statistically representative of all owners & all land in Iowa**
- **Telephone survey**
- Widely used and best available information
- Mandated by Iowa Code since 1989 to be conducted every 5 years
- USDA data: AELOS 1999, TOTAL 2014

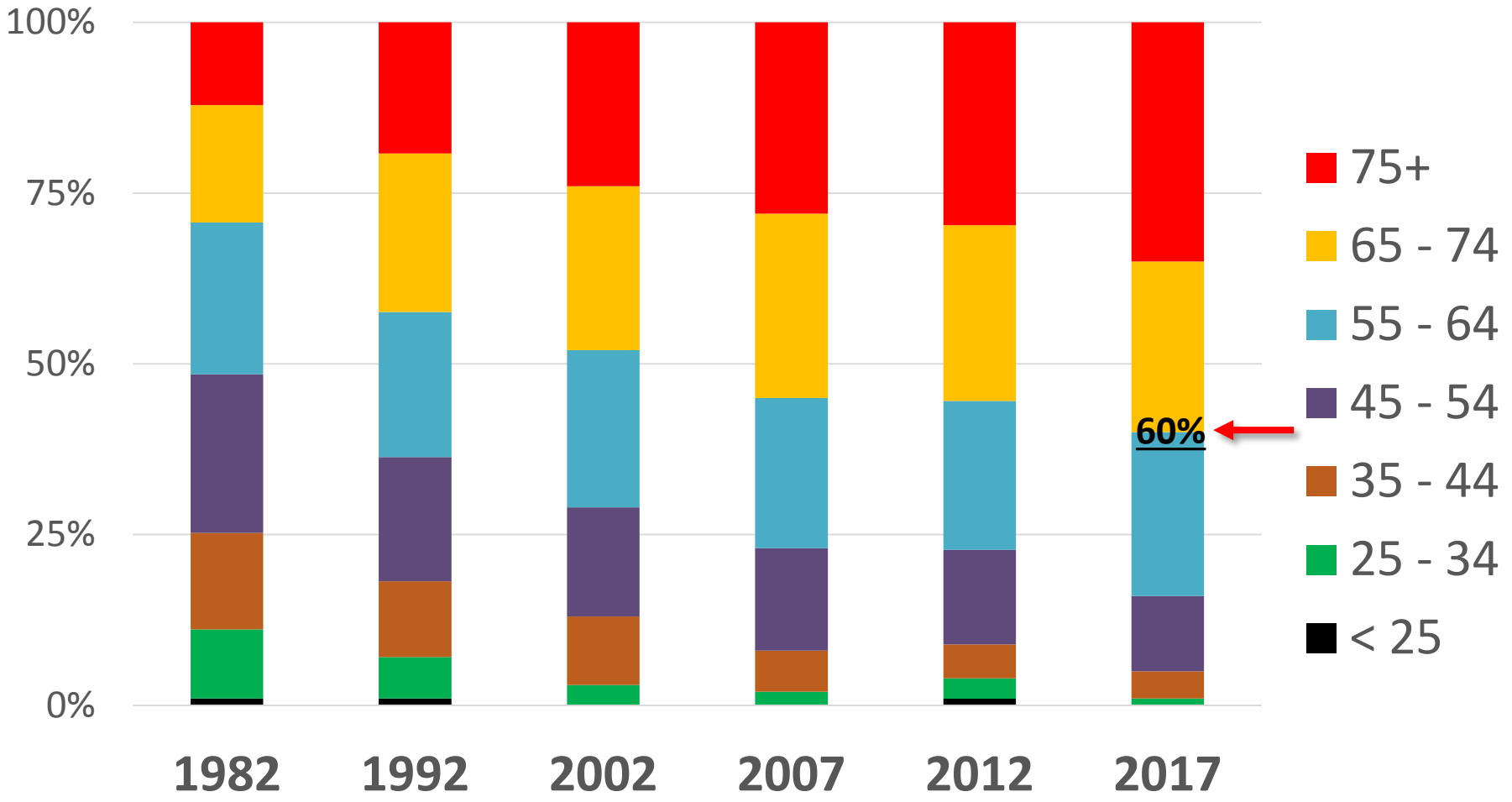
Percent of Farmland Rented (2017)



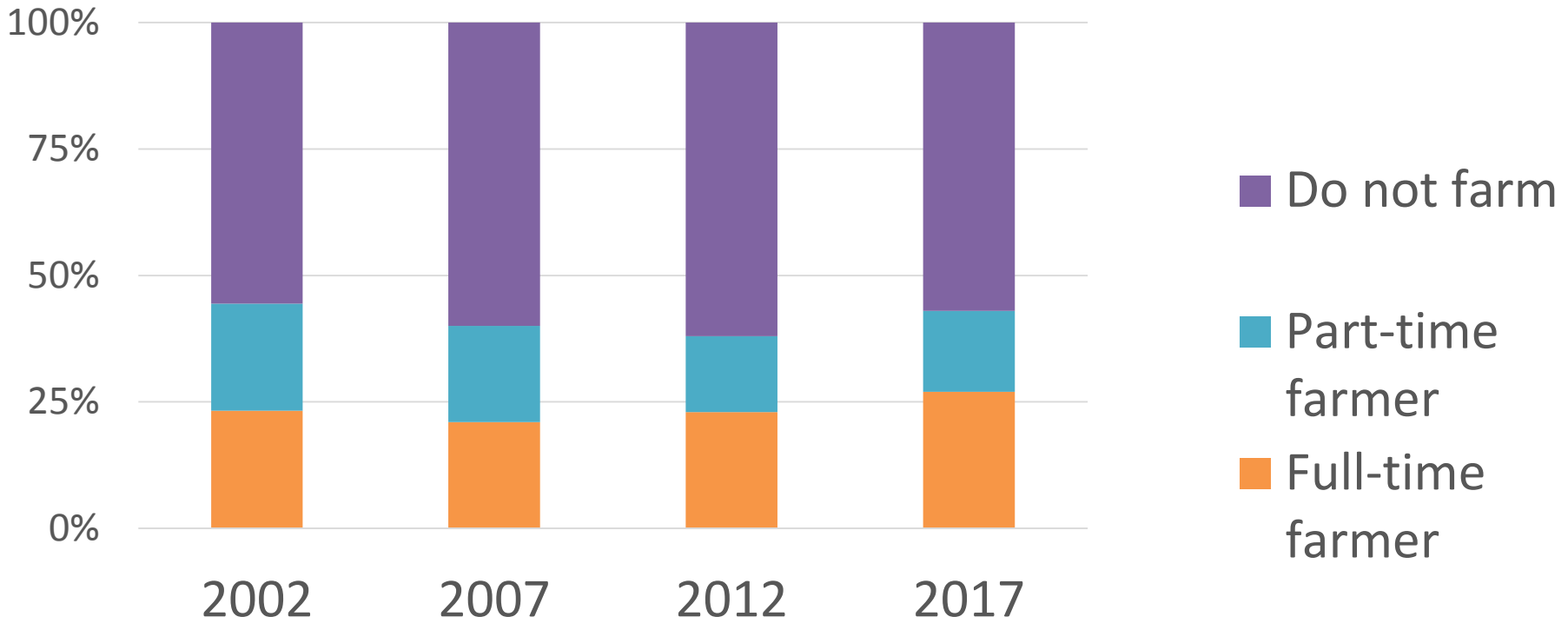
Statewide = 51%

Sources: 2017 USDA Census of Agriculture, May 2019

Percentage of Iowa Farmland by Age of Owner



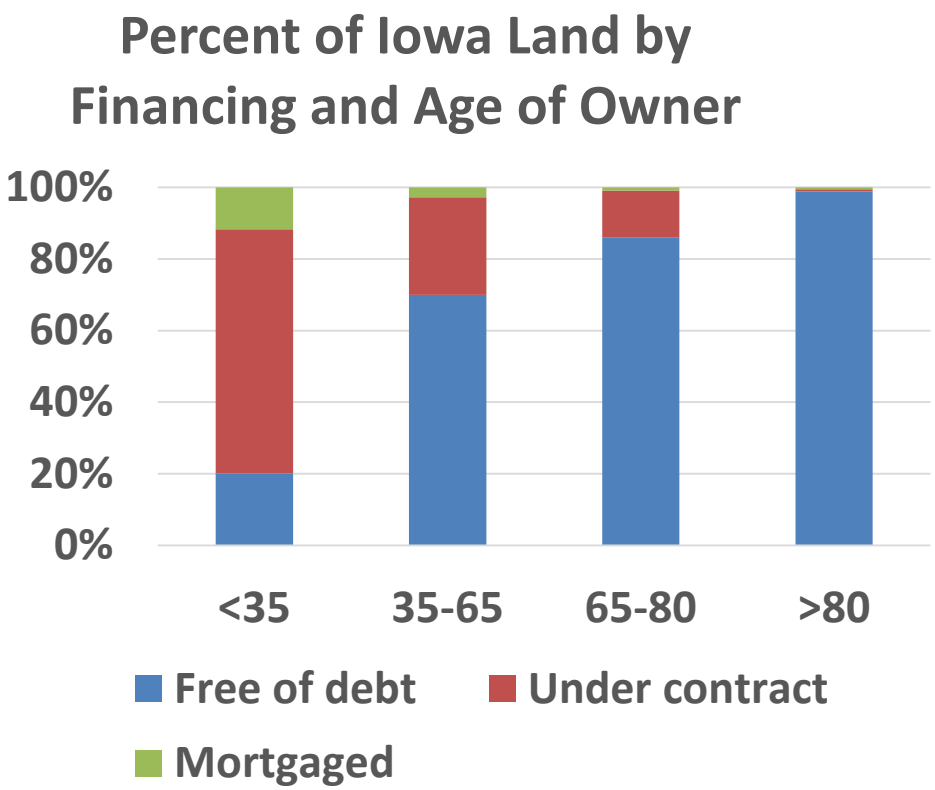
Percentage of Iowa Farmland by Farming Status of Owner



2017: 57% of land owned by owners who do not farm; of these, 34% land owned by owners with no farming experience and 23% by retired farmers

Younger Landowners have more Land Debt

82% of the Land has No Debt



Years Owned	2017	2012
> 50 Years	8%	20%
40-50 Years	12%	
30-40 Years	13%	15%
20-30 Years	20%	19%
10-20 Years	24%	21%
< 10 Years	24%	24%

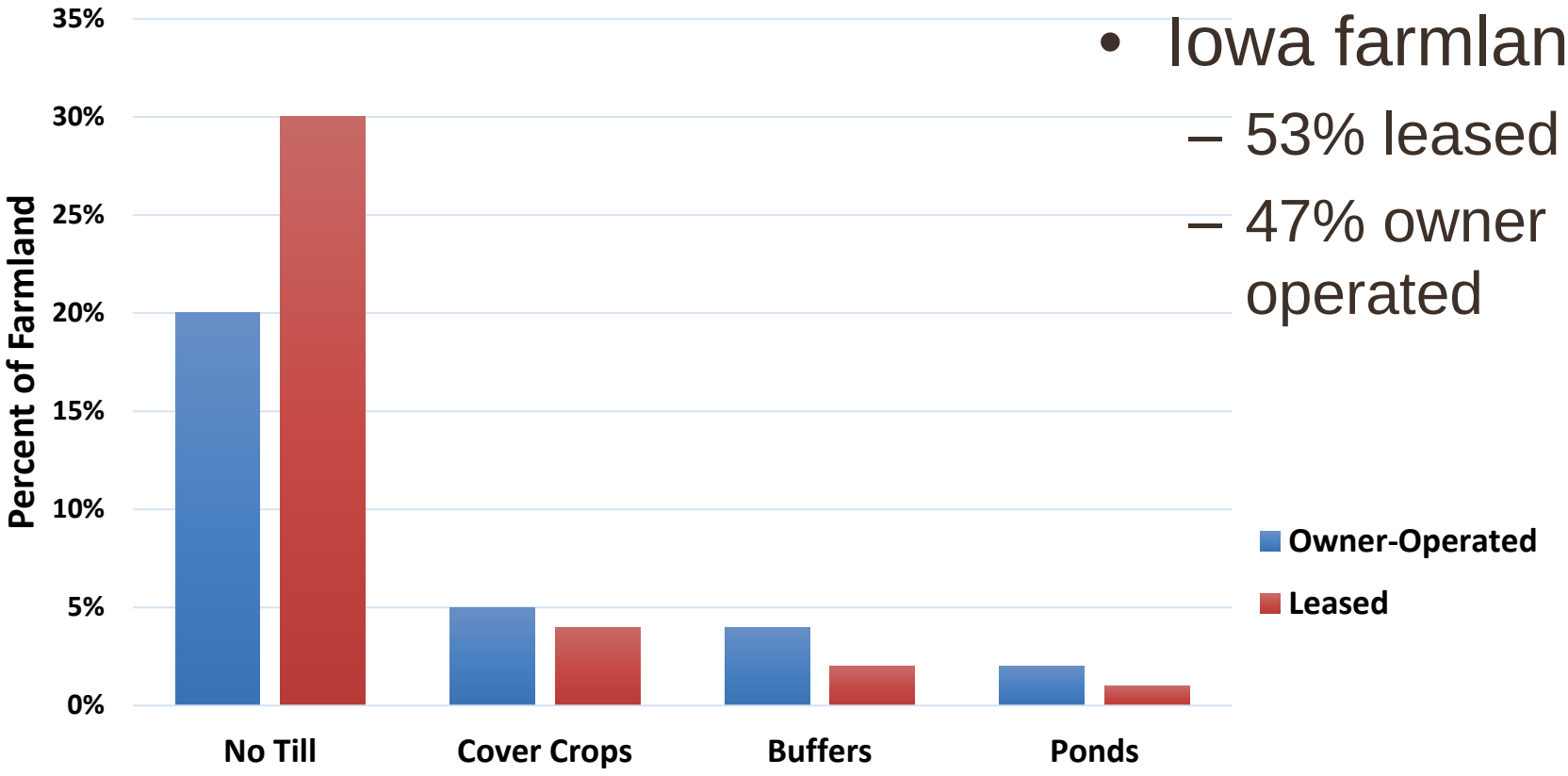
Percent of Land and Owners Using Various Conservation Practices 2017

	Owners	Acres
No till	21%	27%
Cover crops	5%	4%
Buffer strips	3%	3%
Pond or sedimentation basin	1%	2%

Percent of Owner Willing to Help Tenant Adopt Cover Crops by Type 2017

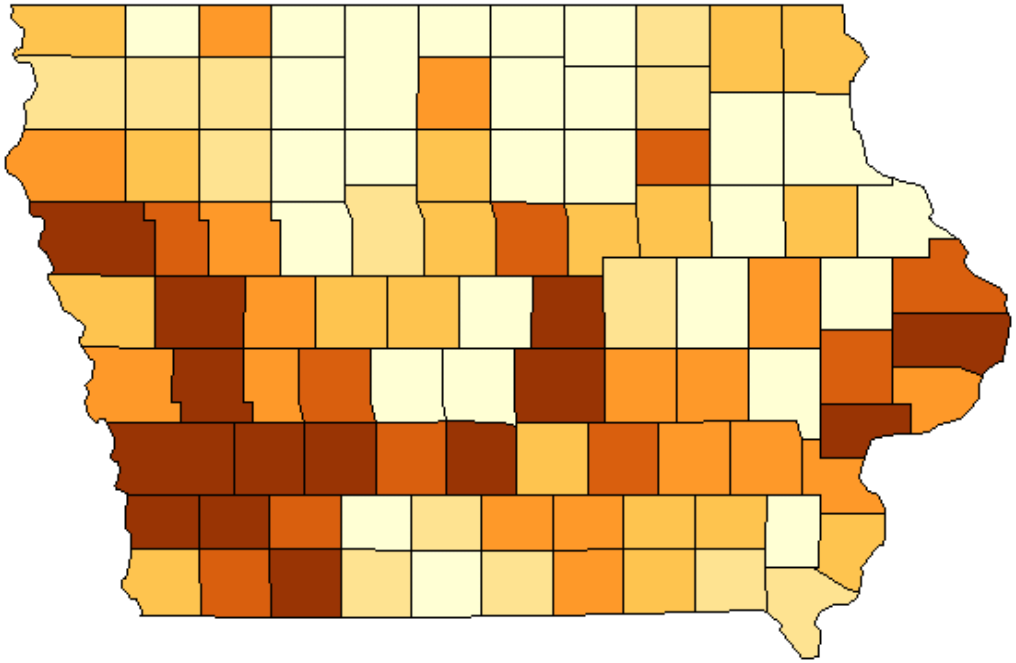
	Pay for a portion of cost to plant cover crops	Lower rent for tenants who plan to plant cover crops	Longer lease for tenants who plan to plant cover crops
Yes	20%	10%	5%
No	25%	7%	9%
Maybe	16%	1%	3%

Conservation by Land Tenure

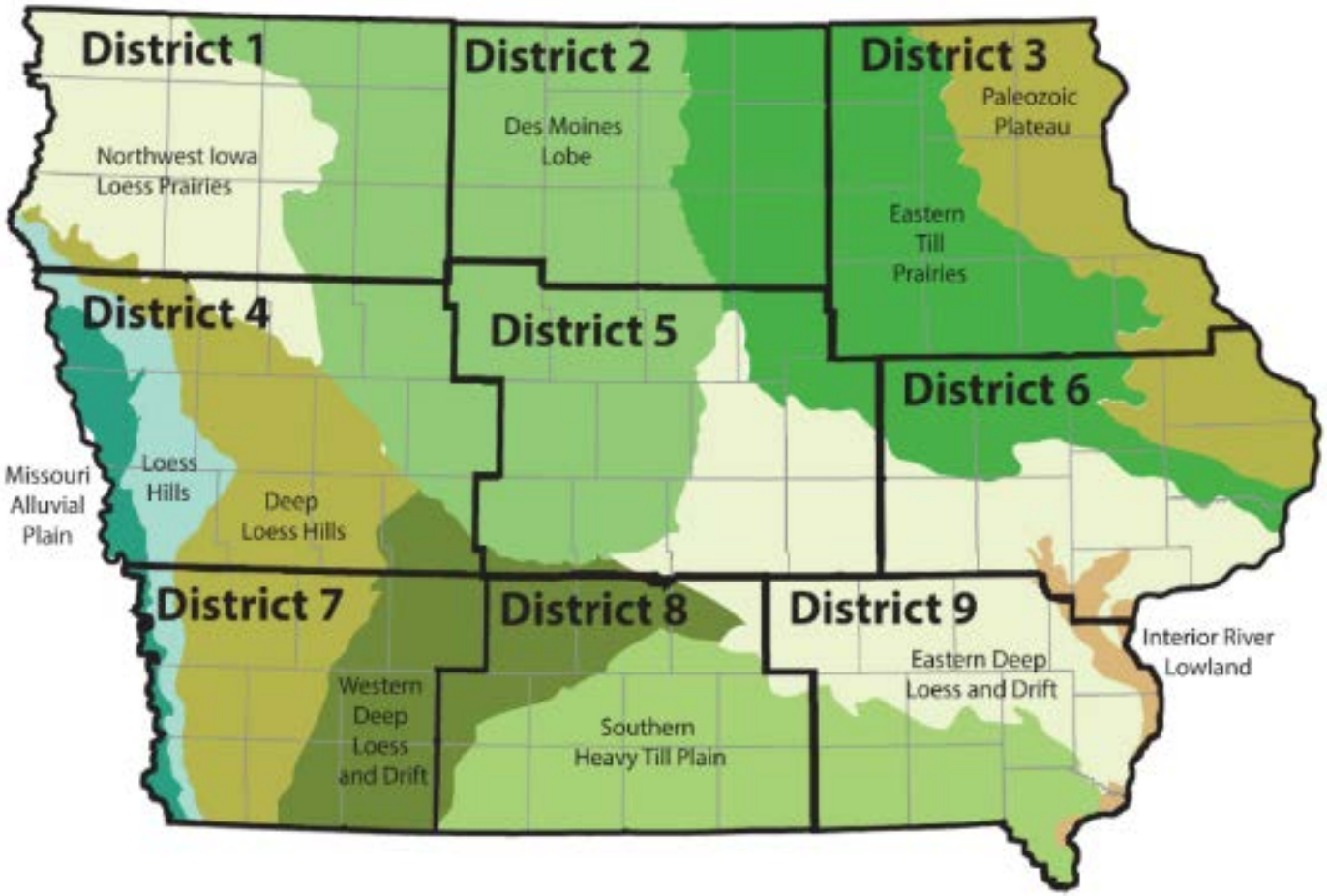


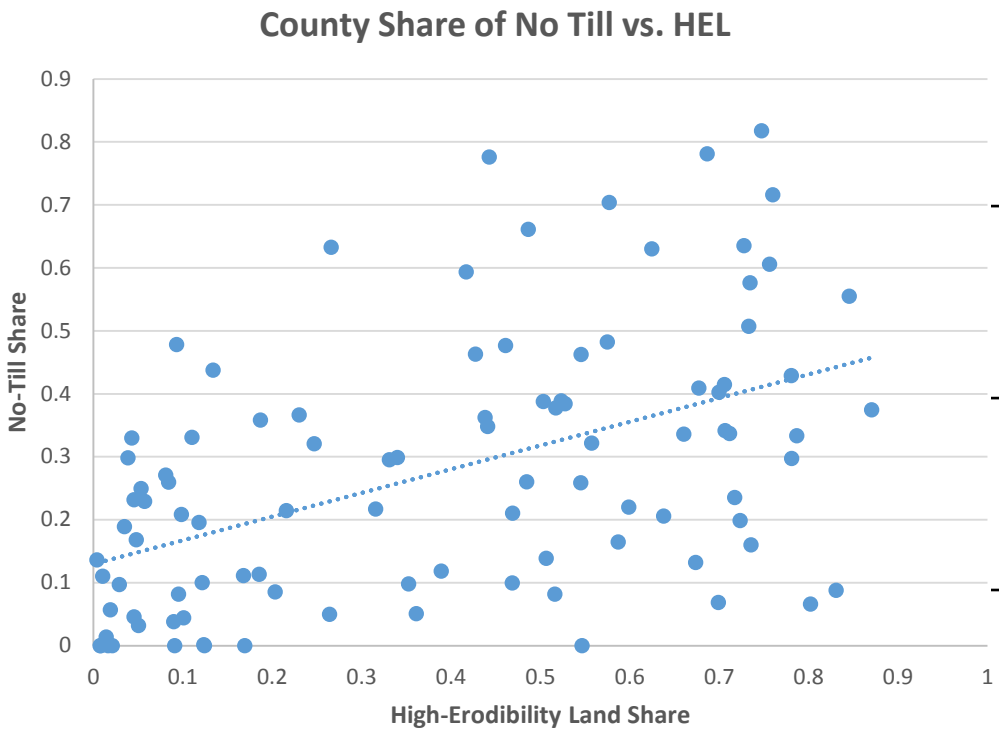
- Iowa farmland
  - 53% leased
  - 47% owner operated

No-Till Use by CRD: State Average 27%



Iowa Major Soil Association

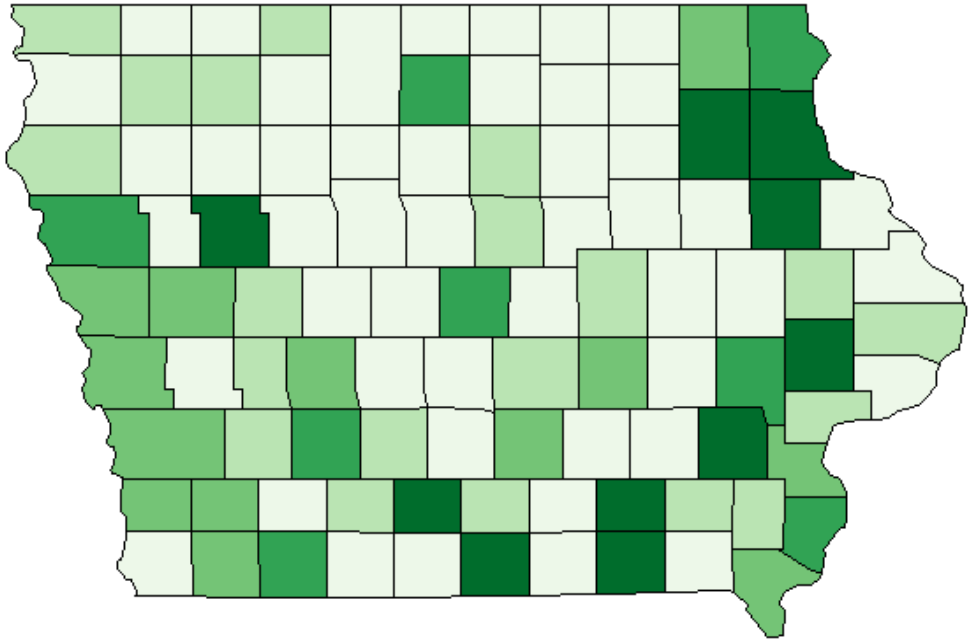




	No-till	Cover crops
Operated – Full time farmer	29%	7%
Rented – Full time farmer	31%	3%
Operated – Part time farmer	13%	3%
Rented – Part time farmer	39%	1%

HEL & Part-Time farmer drives no-till

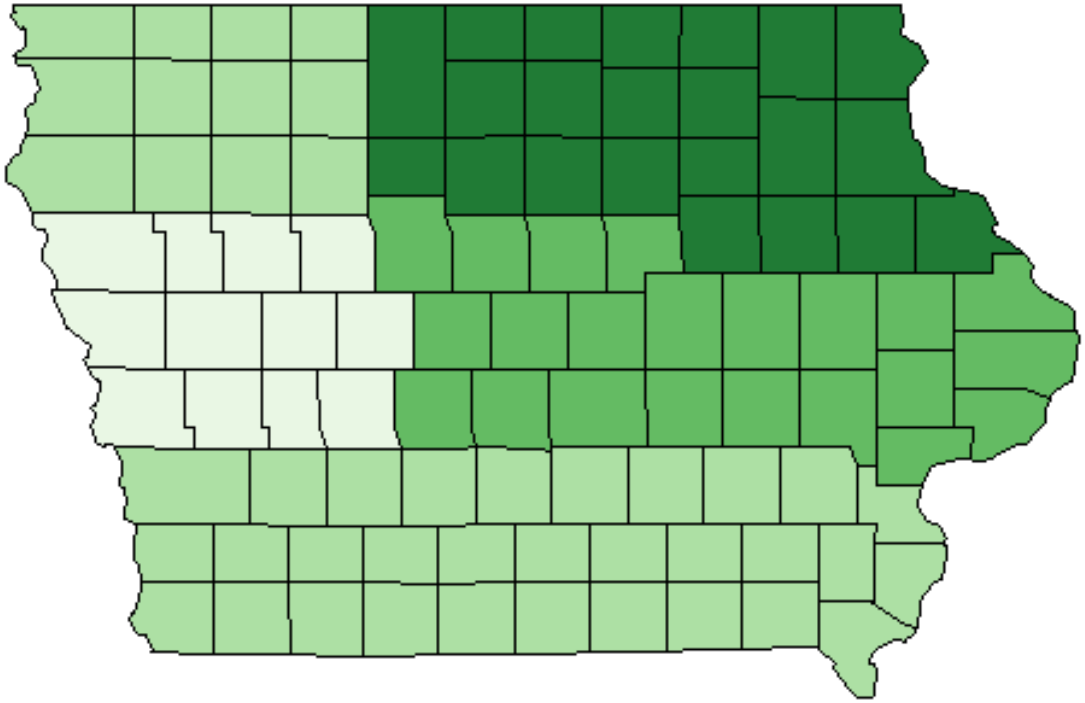
Cover Crop Use by CRD: State Average 4%



Percent of Farmland Using Cover Crops

- 0
- (0 , 3]
- [3,7)
- (7,15]
- > 15

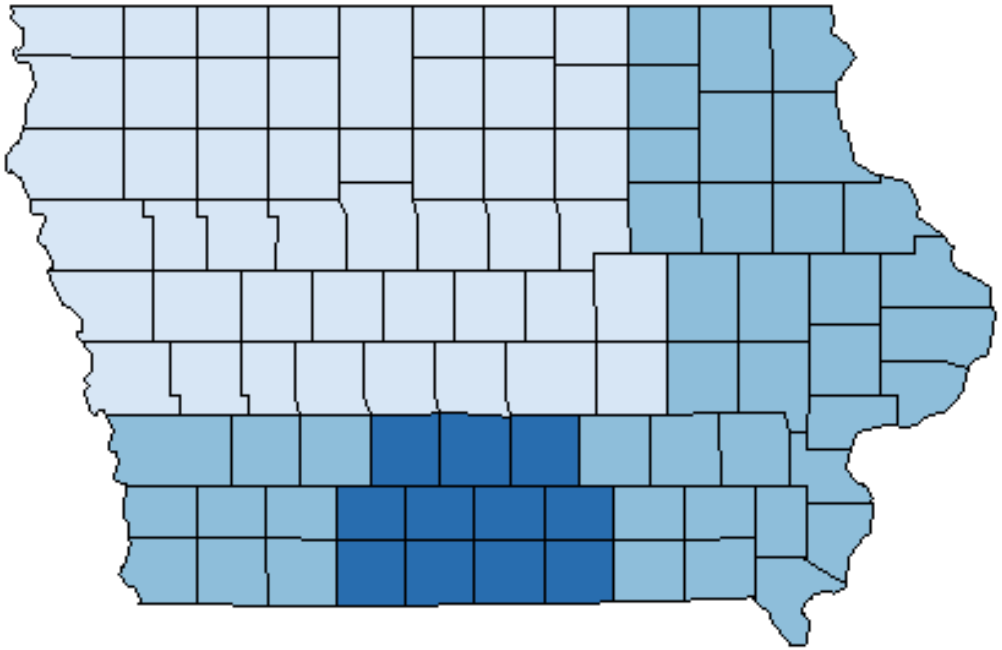
Buffer Strip Use by CRD: State Average 3%



Percent of Farmland Using Buffers

- 0 - 2 %
- 2 - 3 %
- 3 - 5 %
- 5 - 6 %

Ponds/ Sediment Basin Use by CRD: State Average 2%



Percent of Farmland Using Ponds or Sediment Basins

- 0 - 1 %
- 1 - 3 %
- 3 - 5 %

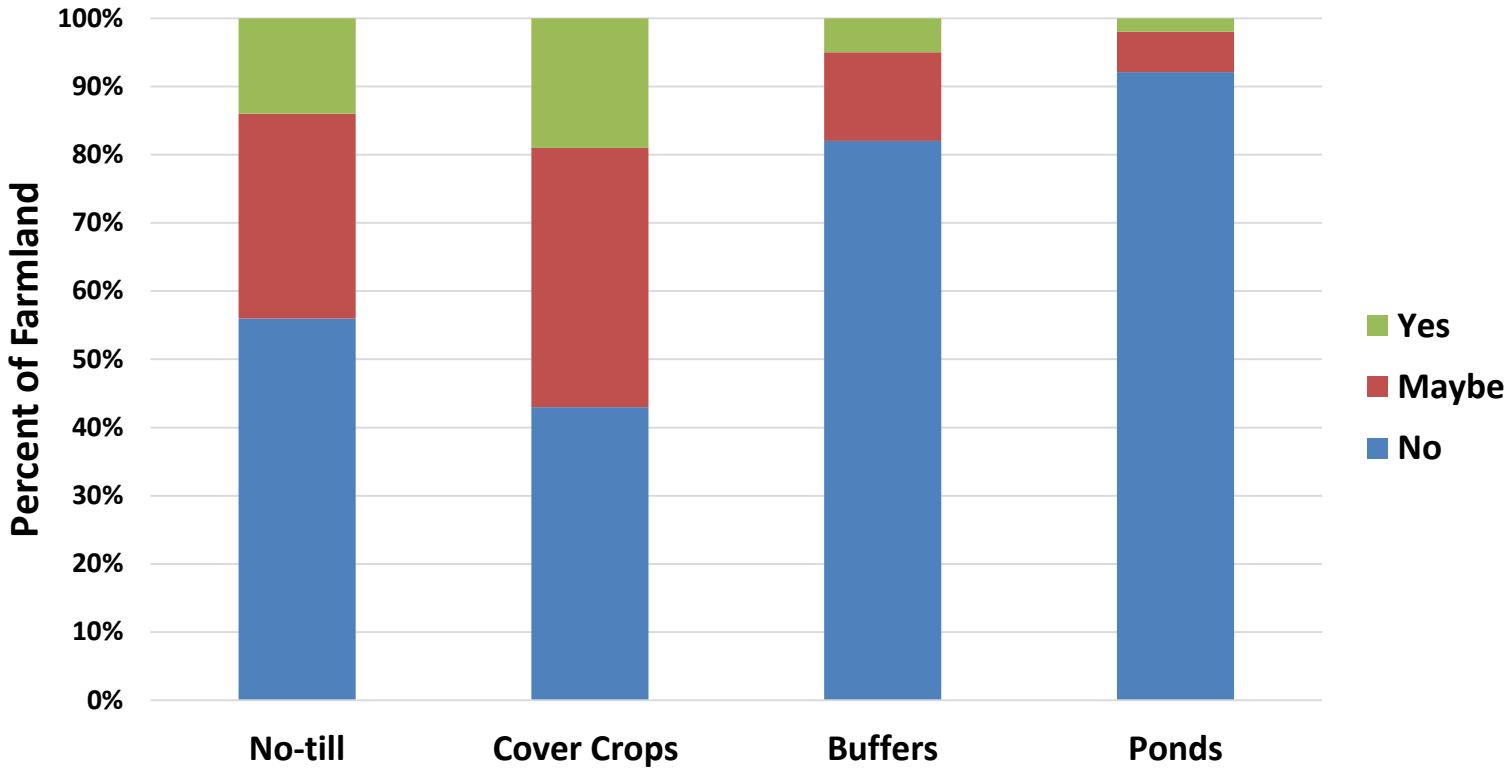
Livestock and Crop Inventory by Crop Reporting District

District	Livestock Inventory - 2012				Acres 2012		Harvested Acres 2017	
	Chickens, Layers	Hogs	Milk Cows	Cattle	Pasture	Timber	Corn	Soybean
Northwest	30%	26%	29%	22%	7%	2%	15%	16%
North Central	64%	16%	4%	6%	4%	4%	14%	13%
Northeast	1%	12%	51%	16%	11%	23%	12%	8%
West Central	0%	13%	1%	13%	10%	7%	15%	16%
Central	3%	13%	1%	7%	8%	8%	15%	14%
East Central	1%	5%	10%	11%	11%	14%	11%	10%
Southwest	0%	2%	0%	9%	12%	5%	8%	10%
South Central	0%	2%	1%	9%	25%	19%	4%	6%
Southeast	1%	11%	3%	6%	12%	19%	7%	8%
Iowa Total	52.2 million	20.4 million	0.17 million	3.8 million	2.5 million	1.2 million	12.9 million	10.0 million

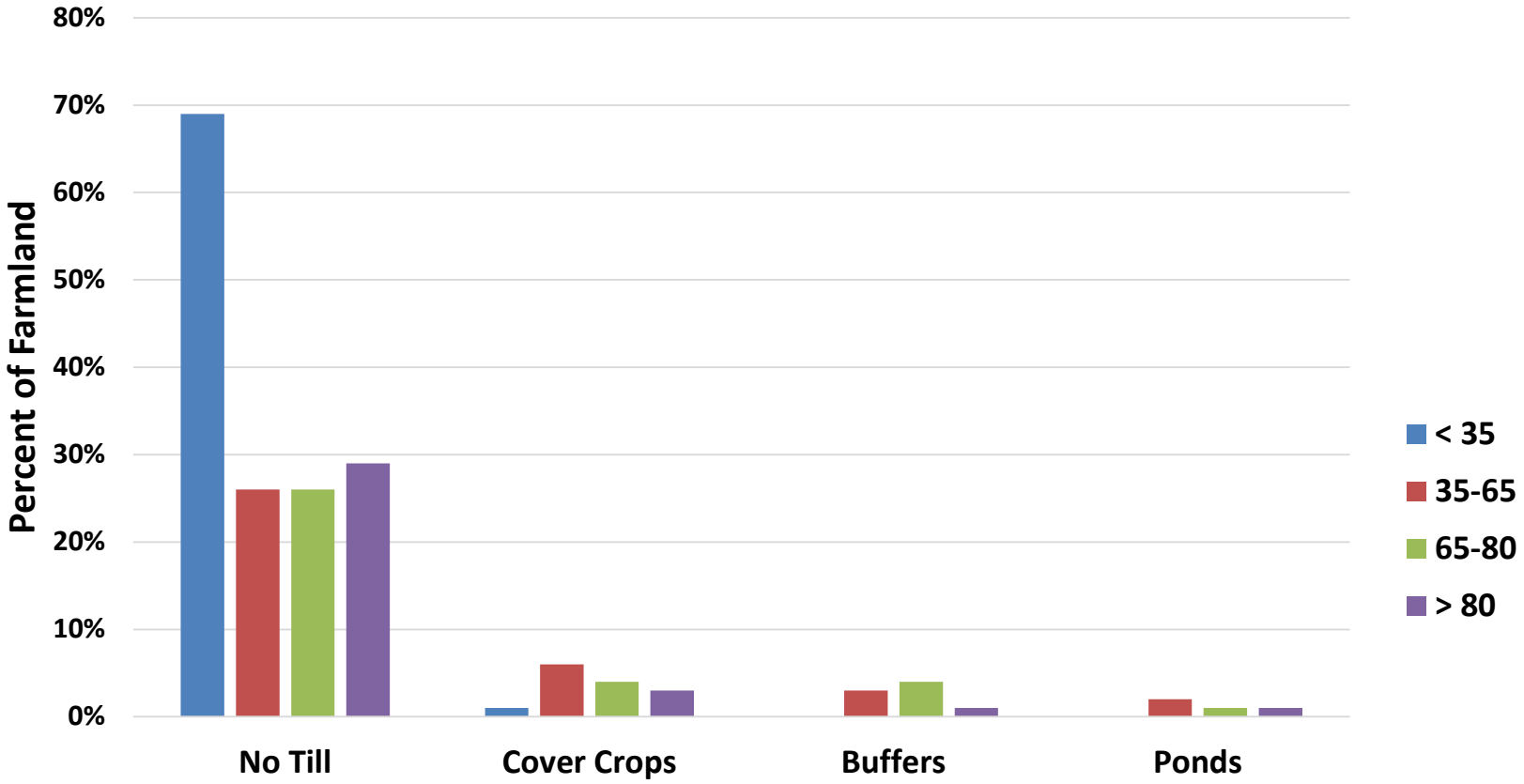
Reasons for Not Using Conservation Practices

- No-till:
  1. Not suitable for land/ soil (19%)
  2. Hurts crop yield (18%)
- Cover crops:
  1. High termination cost (21%)
  2. Too short of a season to plant them (19%)

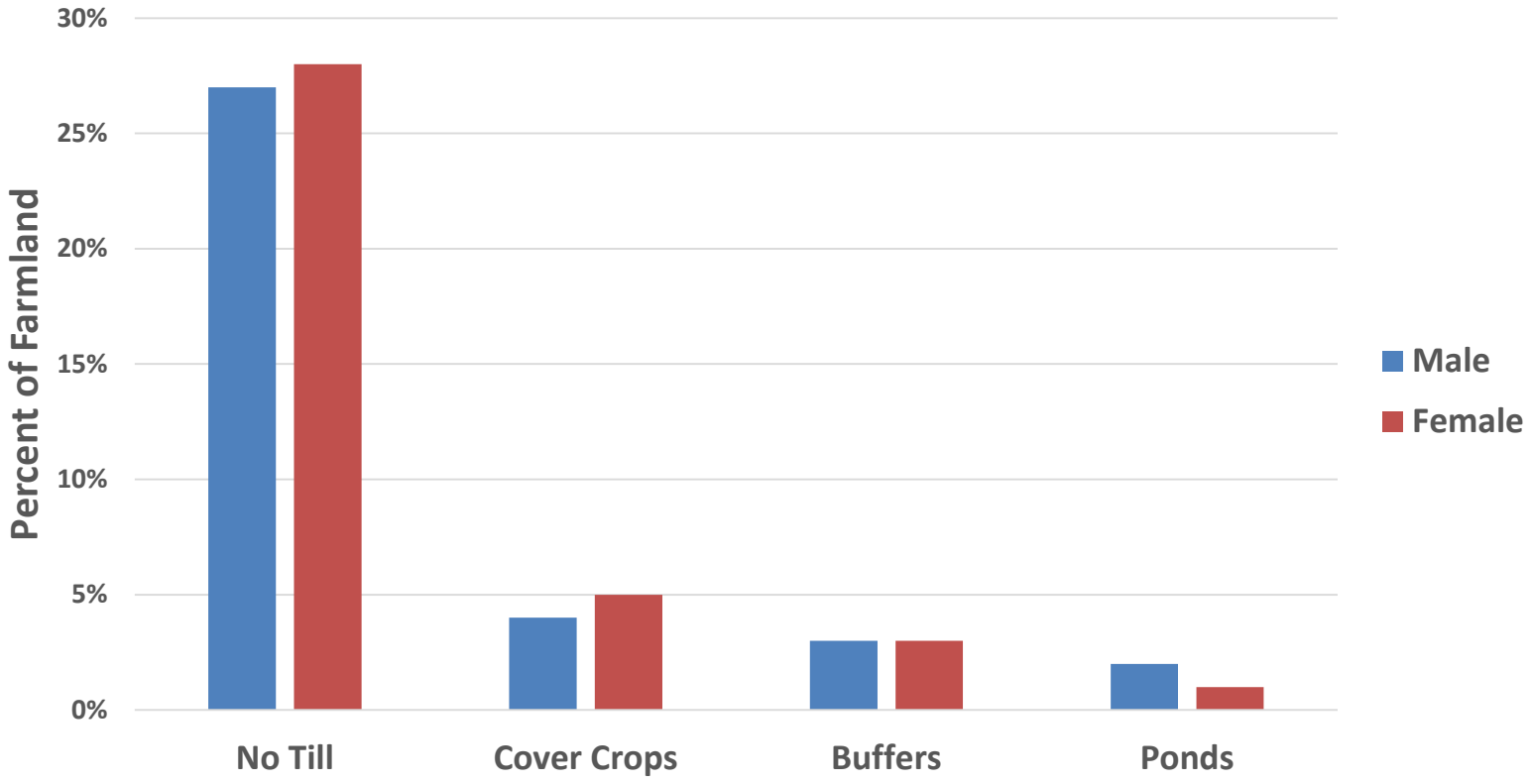
Likelihood of Using Practices in Next Five Years



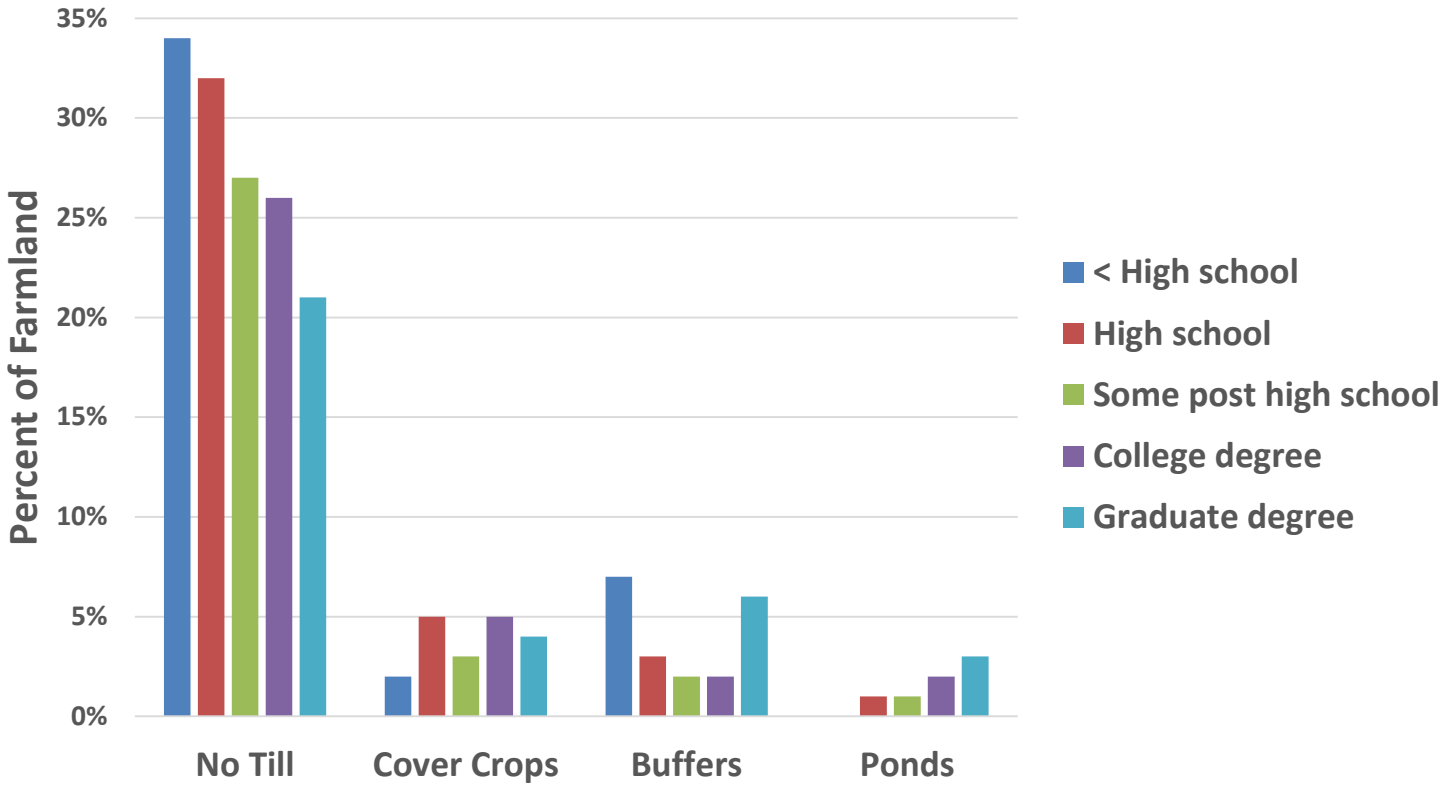
Conservation Use by Age of Landowner



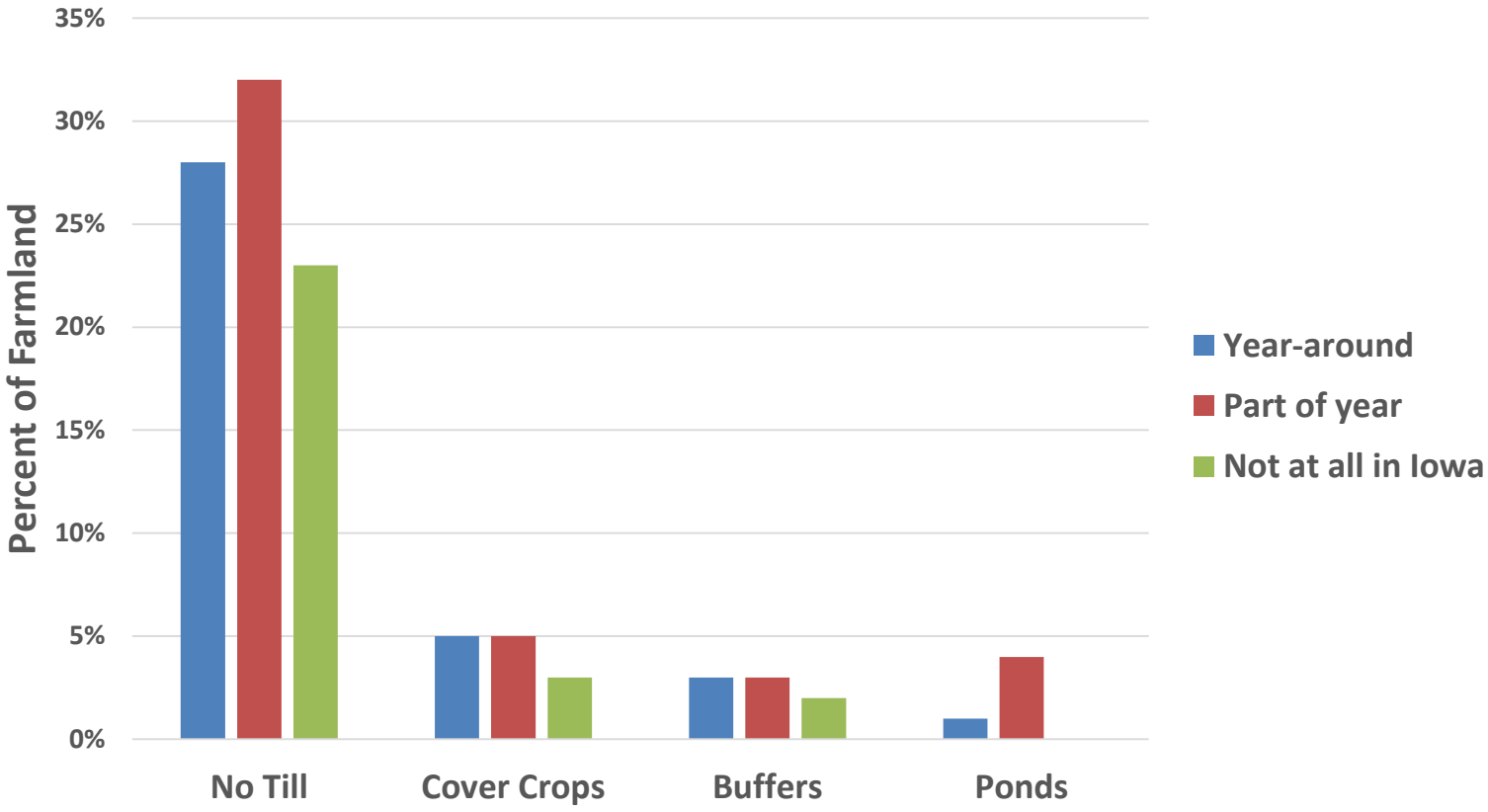
Conservation Use by Gender of Landowner



Conservation Use by Education of Landowner

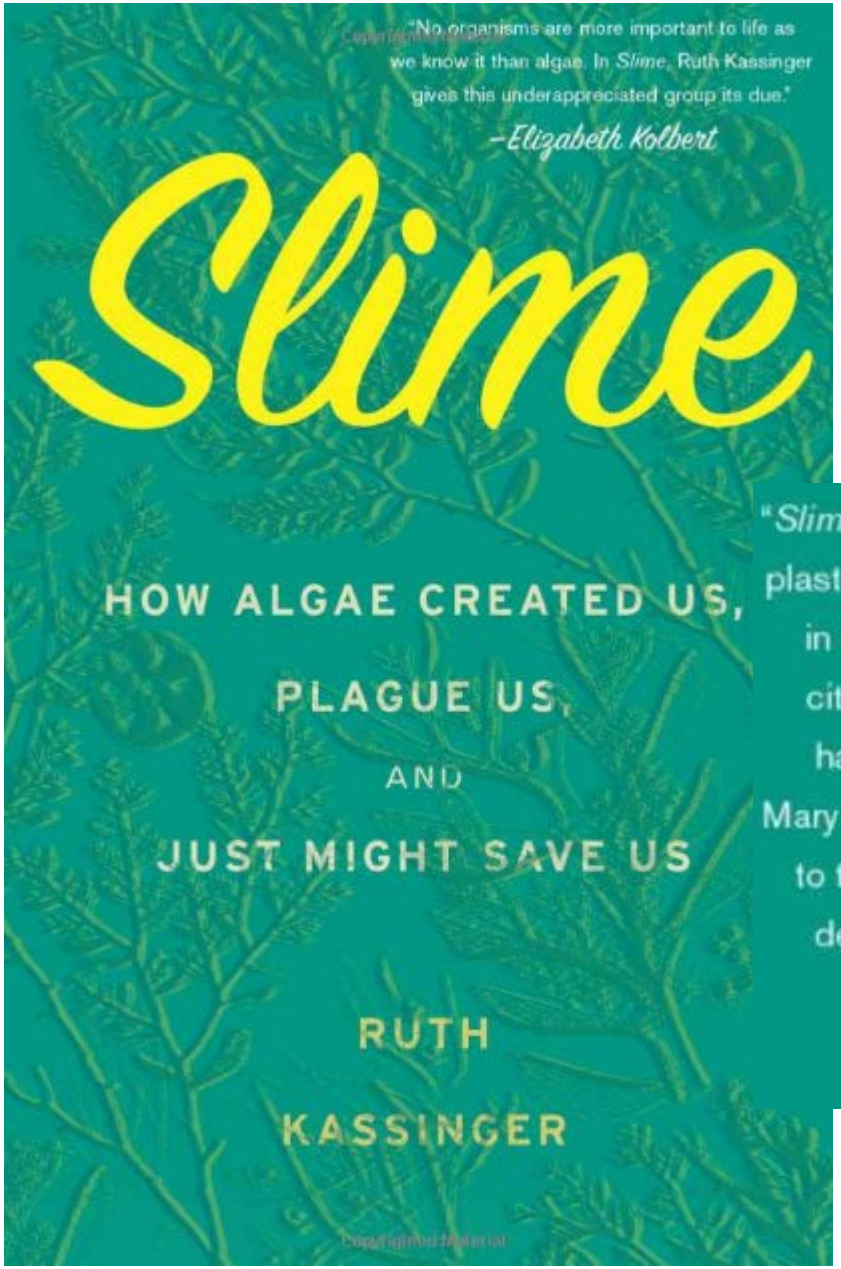


Conservation Use by Residence of Landowner



Conclusion

- Current use of conservation varies by practice throughout Iowa
- Presence of conservation on rented (vs. owned) land differs by practice
  - More no-till acres
  - Fewer acres with buffers and ponds
- Landowners are open to using cover crops on their land in the future



SAY "ALGAE" AND MOST PEOPLE THINK OF POND SCUM. WHAT THEY DON'T KNOW IS THAT WITHOUT ALGAE, NONE OF US WOULD EXIST.

"*Slime* is a revelation! Algae have the power to cool the planet, replace plastics, fuel vehicles, and feed the world. This visionary book belongs in the hands of every policy maker, business leader, and engaged citizen looking for answers to our most pressing problems. It also happens to be a delightful read in the tradition of Susan Orlean, Mary Roach, and Michael Pollan. Ruth Kassinger turns a reporter's eye to the natural world and finds an epic narrative there, populated by dedicated scientists, intrepid chefs, and starry-eyed visionaries."

–*Amy Stewart*, *New York Times* best-selling author of *The Drunken Botanist* and the Kopp Sisters novels

Thank You!

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