

Trends and Yield Impacts of Cover Crops Across the U.S.



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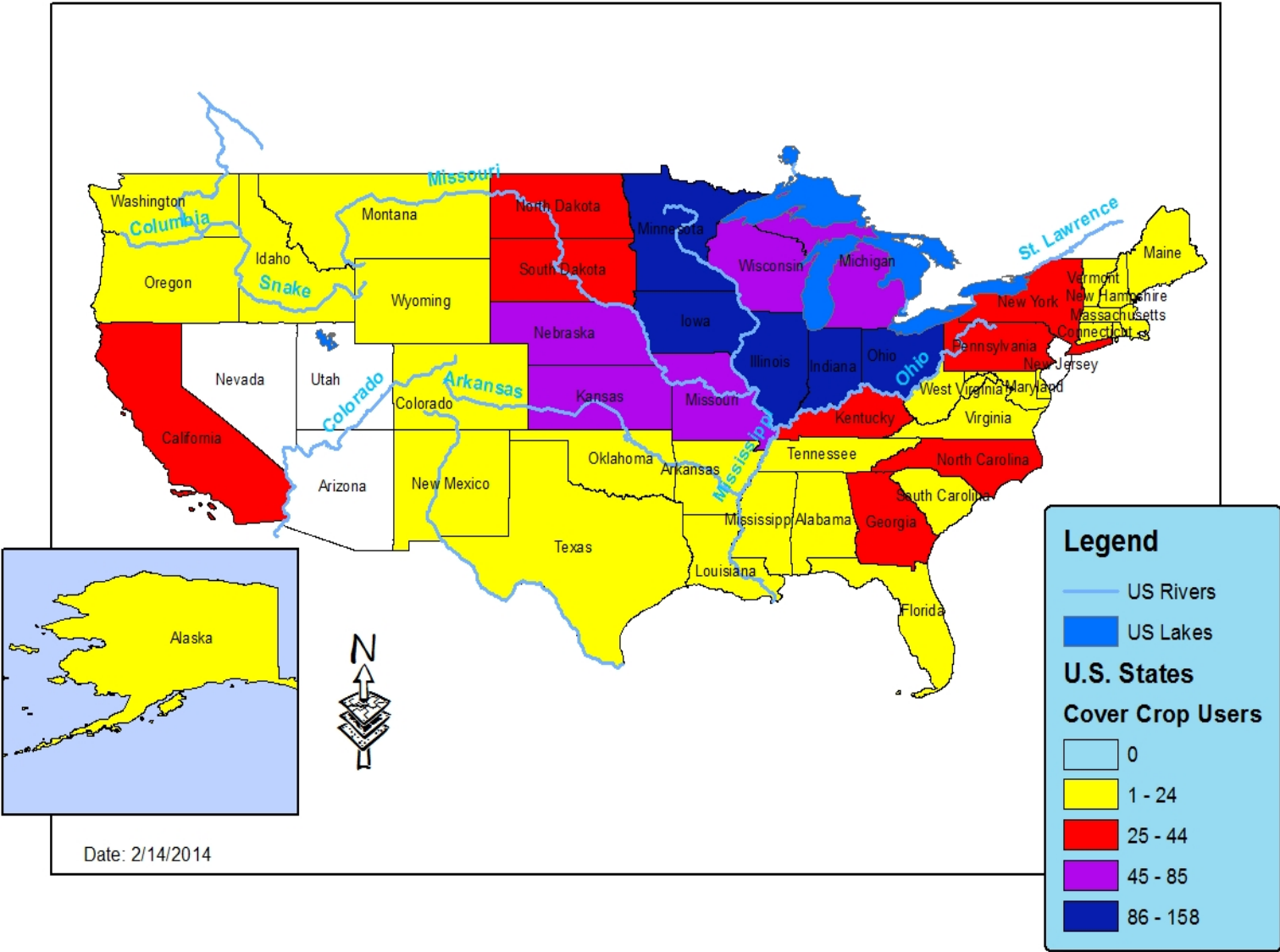


Sunlight being harvested



October 30, 2013, Steve Groff farm, southeastern PA

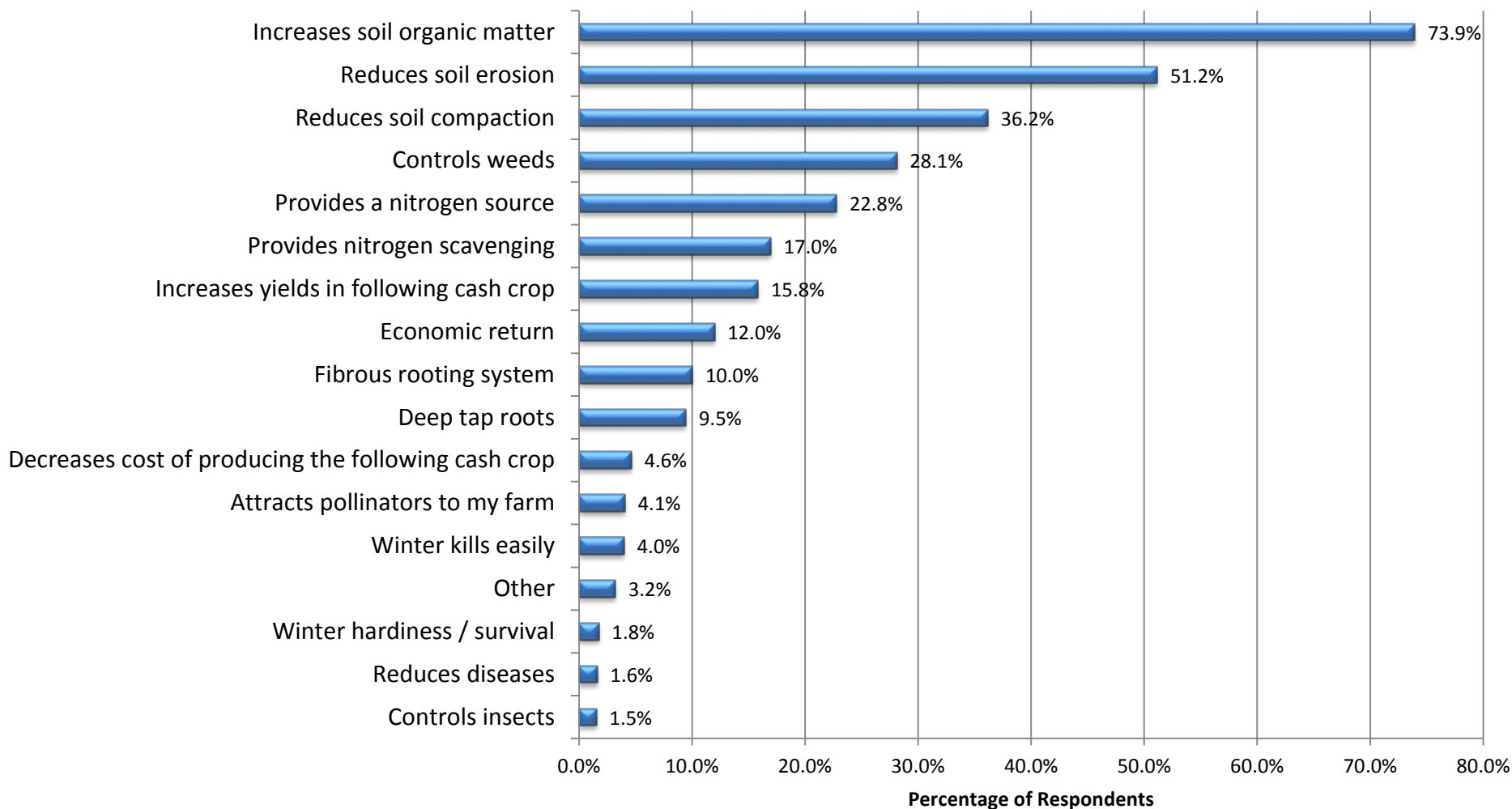
Cover Crop User Respondents by State



Preliminary data from 2013-14 SARE/CTIC cover crop survey

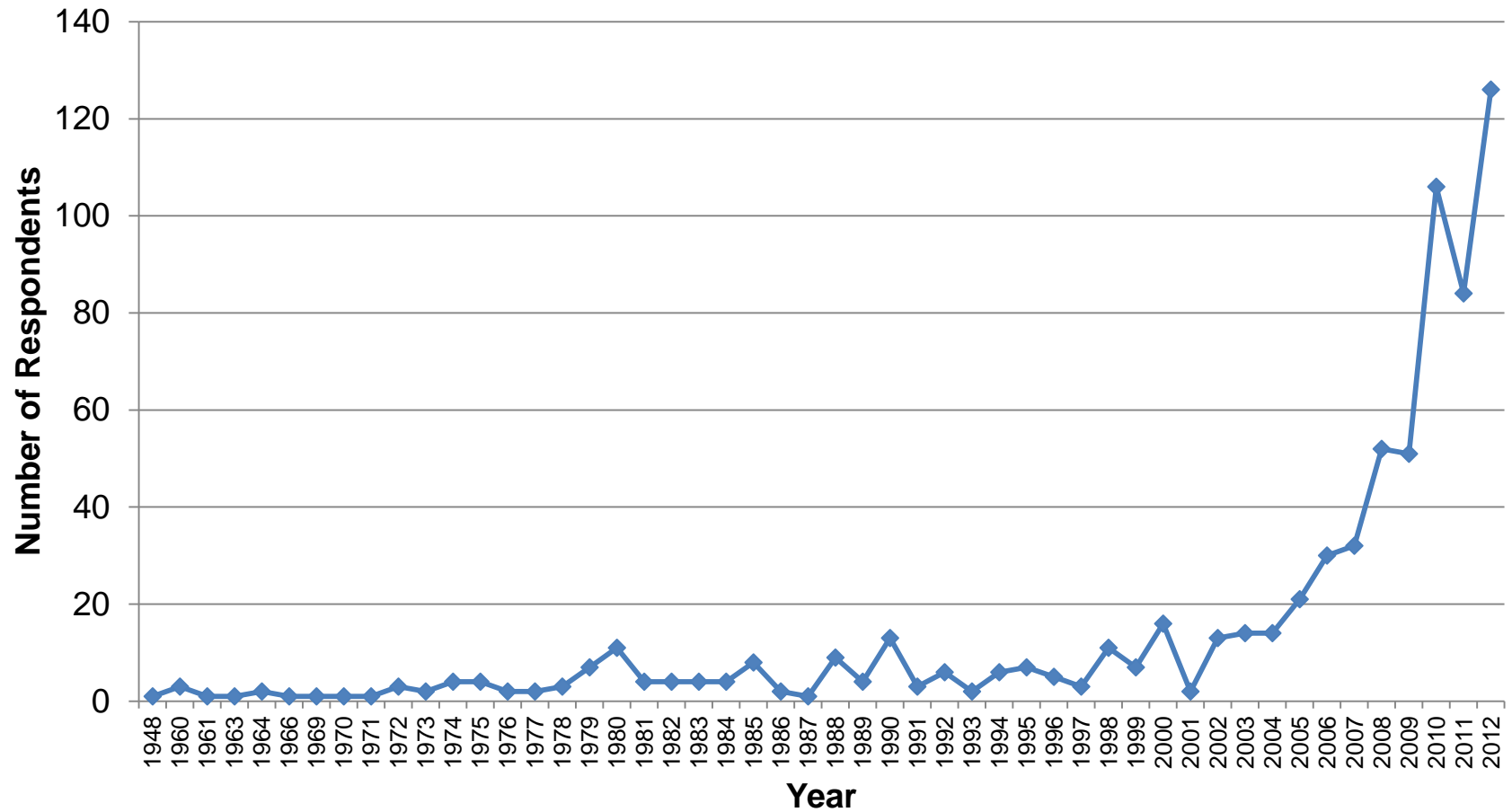
Why are farmers planting cover crops?

Desired Cover Crop Benefits



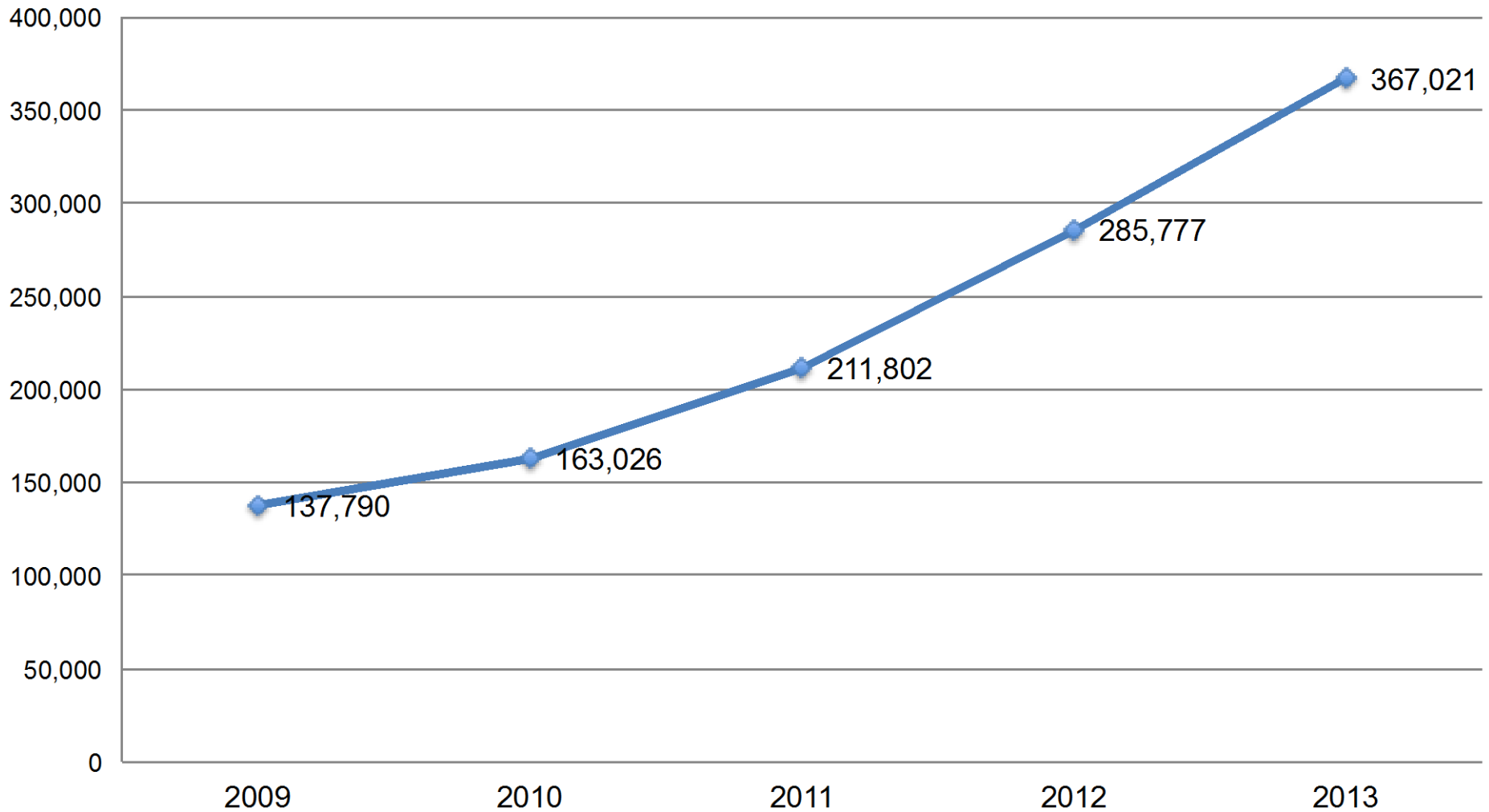
Preliminary data from 2013-14 SARE/CTIC cover crop survey

First Year Farmers Planted a Cover Crop



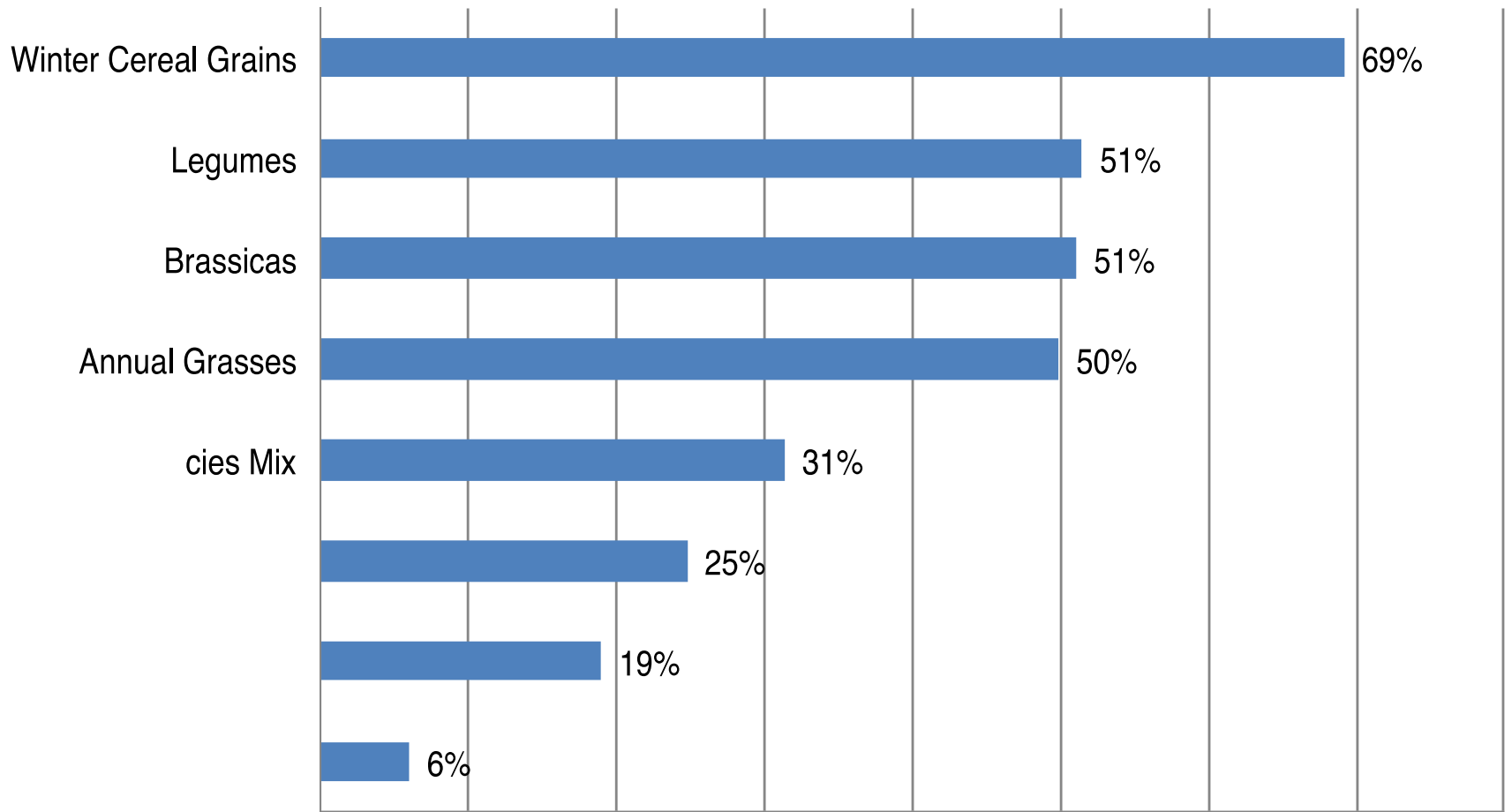
Preliminary data from 2013-14 SARE/CTIC cover crop survey

Total acres of cover crops planted by surveyed farmers



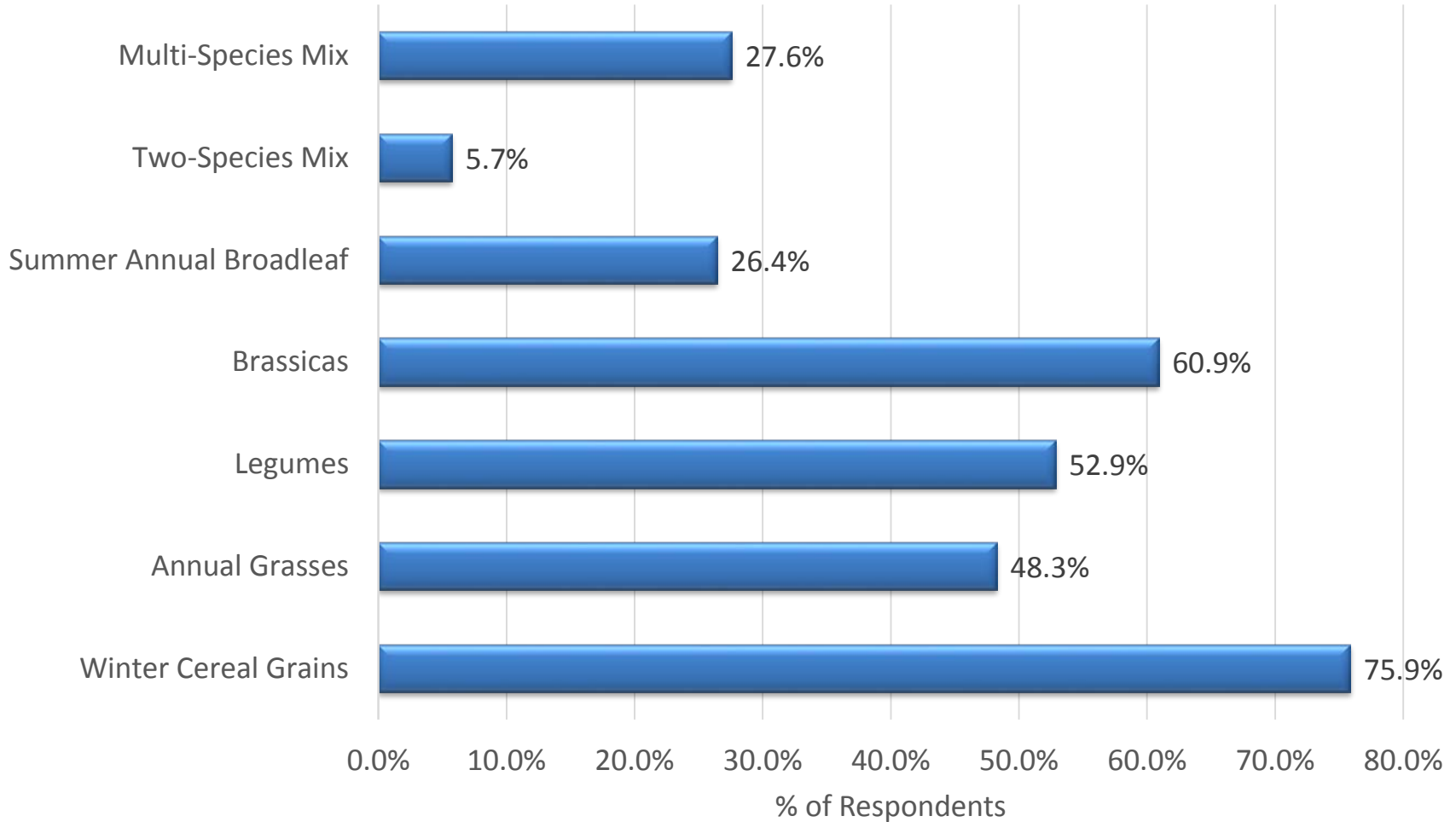
Preliminary data from 2013-14 SARE/CTIC cover crop survey

Cover Crop Species Used by % of Respondents



Preliminary data from 2013-14 SARE/CTIC cover crop survey

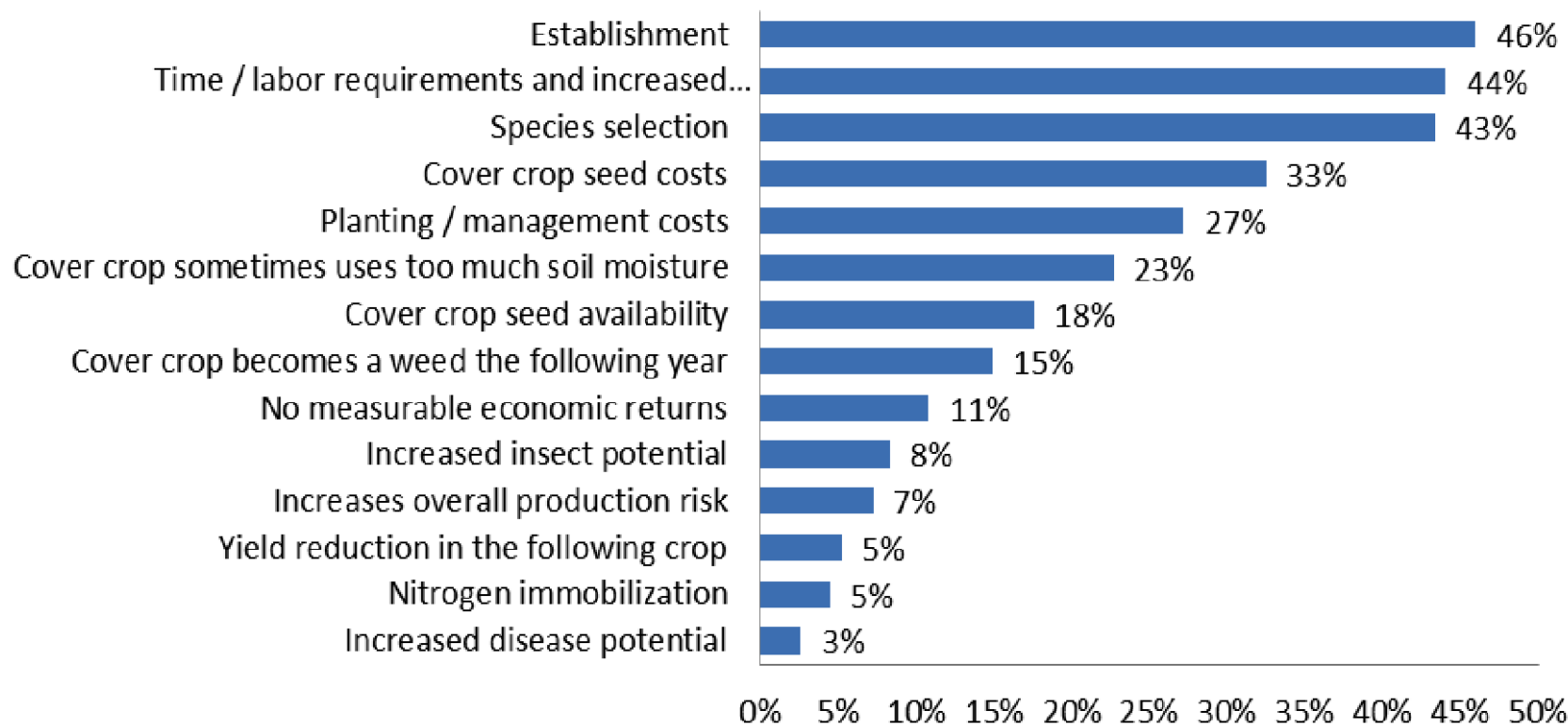
Cover crop species planted in Missouri



Preliminary data from 2013-14 SARE/CTIC cover crop survey

Biggest Cover Crop Challenges

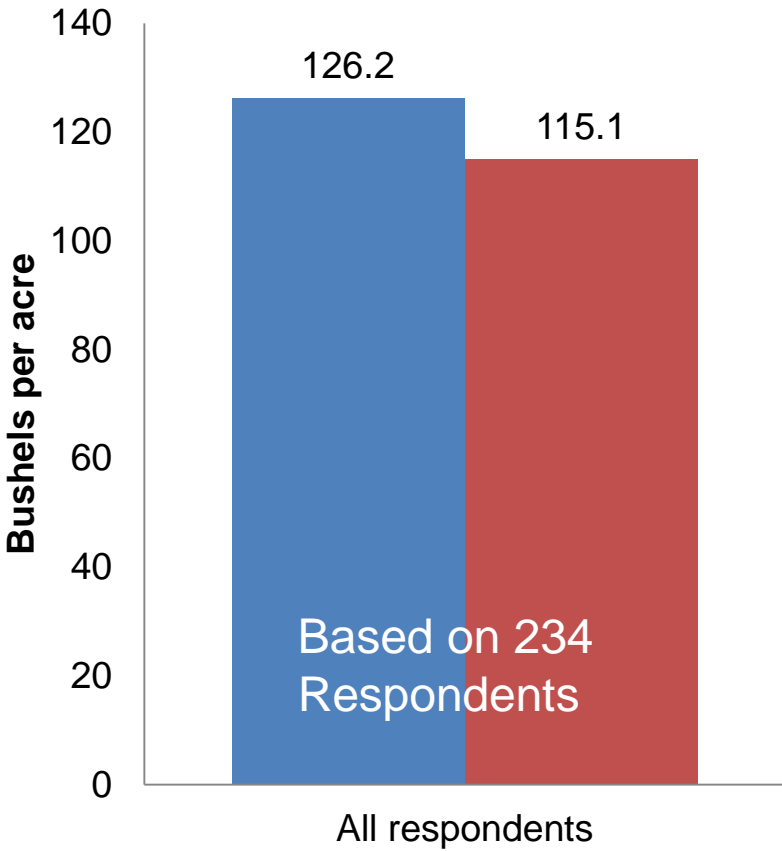
Biggest Cover Crop Challenges (% of Respondents)



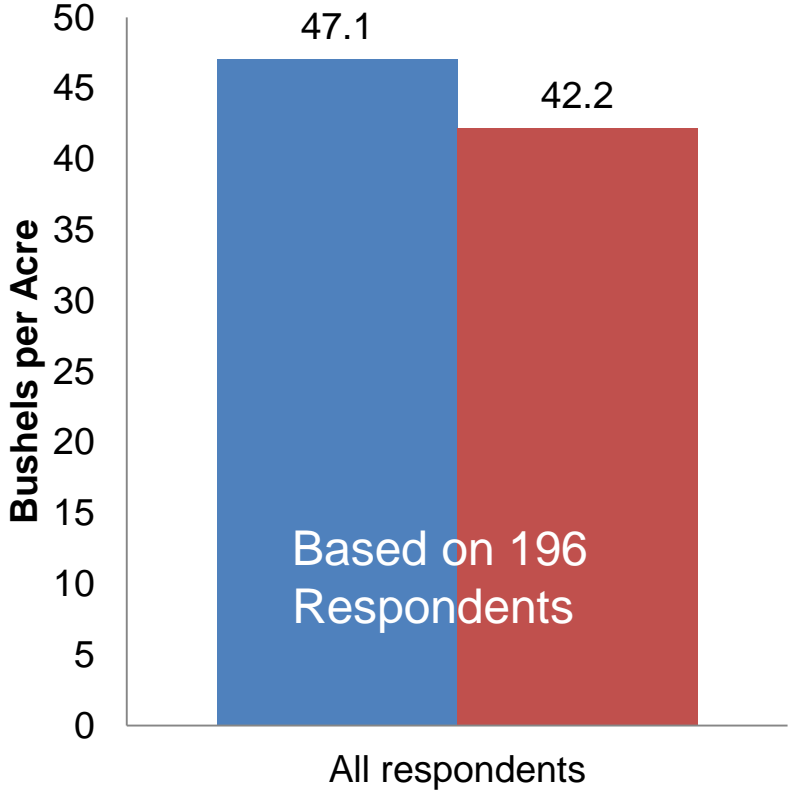
COVER CROP IMPACT ON CORN AND SOYBEAN YIELDS IN THE DROUGHT YEAR OF 2012



Impact of Cover Crops on Corn and Soybean 2012 Yields*



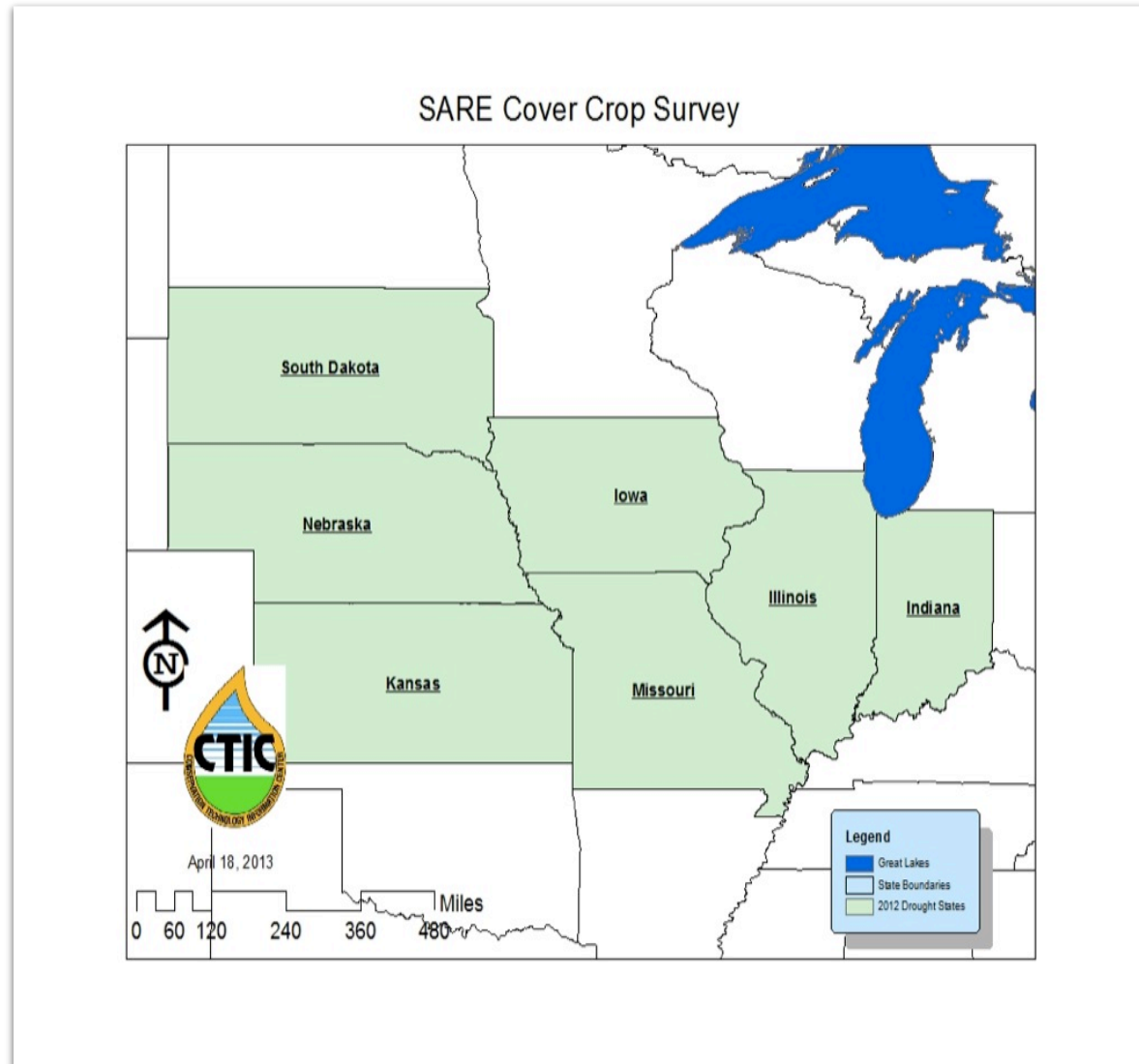
■ corn with covers ■ corn without covers



■ Soybeans with covers ■ Soybeans without covers

**Yields are for 2012 on farms where farmers had side by side fields with similar management and varieties, other than using cover crops or not*

States affected by the 2012 drought



Drought States Commodity Crop Yields as Impacted by Cover Crops in 2012

- Broke the data down to look at yield impact in seven of the states hit hardest by drought
(specifically NE, KS, SD, MO, IA, IL, and IN)

Group of respondents

drought states (7 states)

11.0% Yield Increase



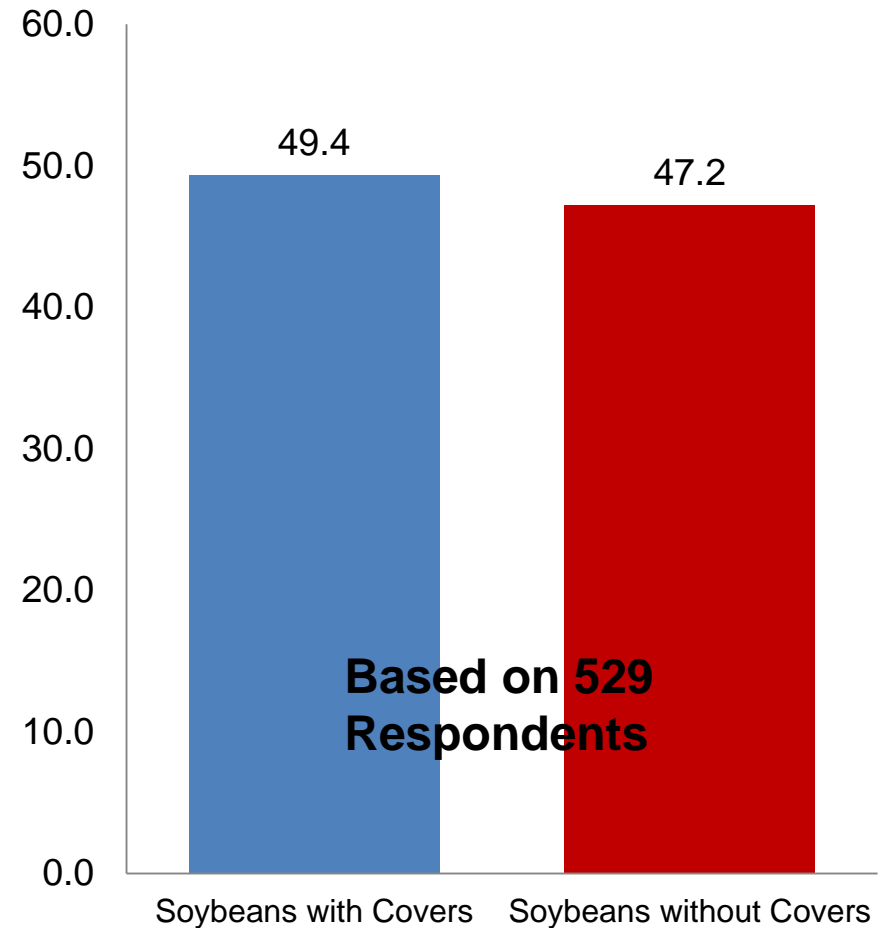
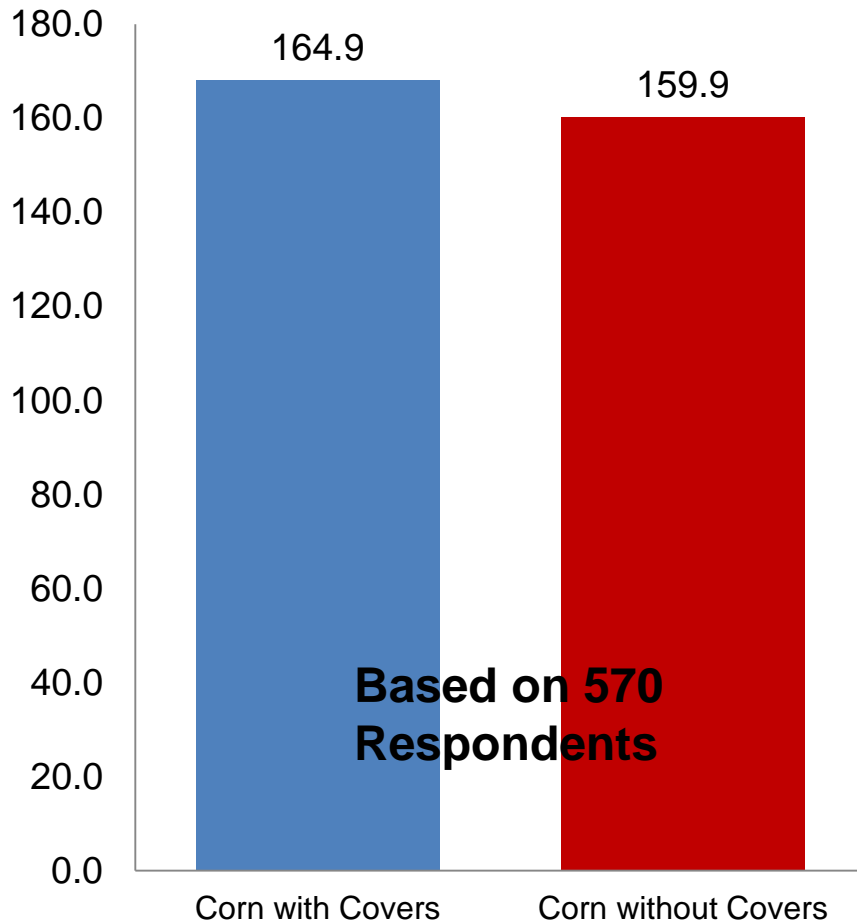
How can cover crops help in a drought?

- Benefits that may occur from cover crop in first year
 - Deep rooting cover crops lead to deeper rooting cash crops
 - Residue blanket reduces evaporation
 - Possible changes in mycorrhizae and overall soil biology
- Long term benefits
 - Increased organic matter
 - Better rainfall infiltration
 - Better retention of moisture in the soil profile
 - Better soil health
 - Less restrictions to root growth
 - Use of cover crops is often accompanied by other changes, like the move to no-till (each tillage pass causes the loss of soil moisture)

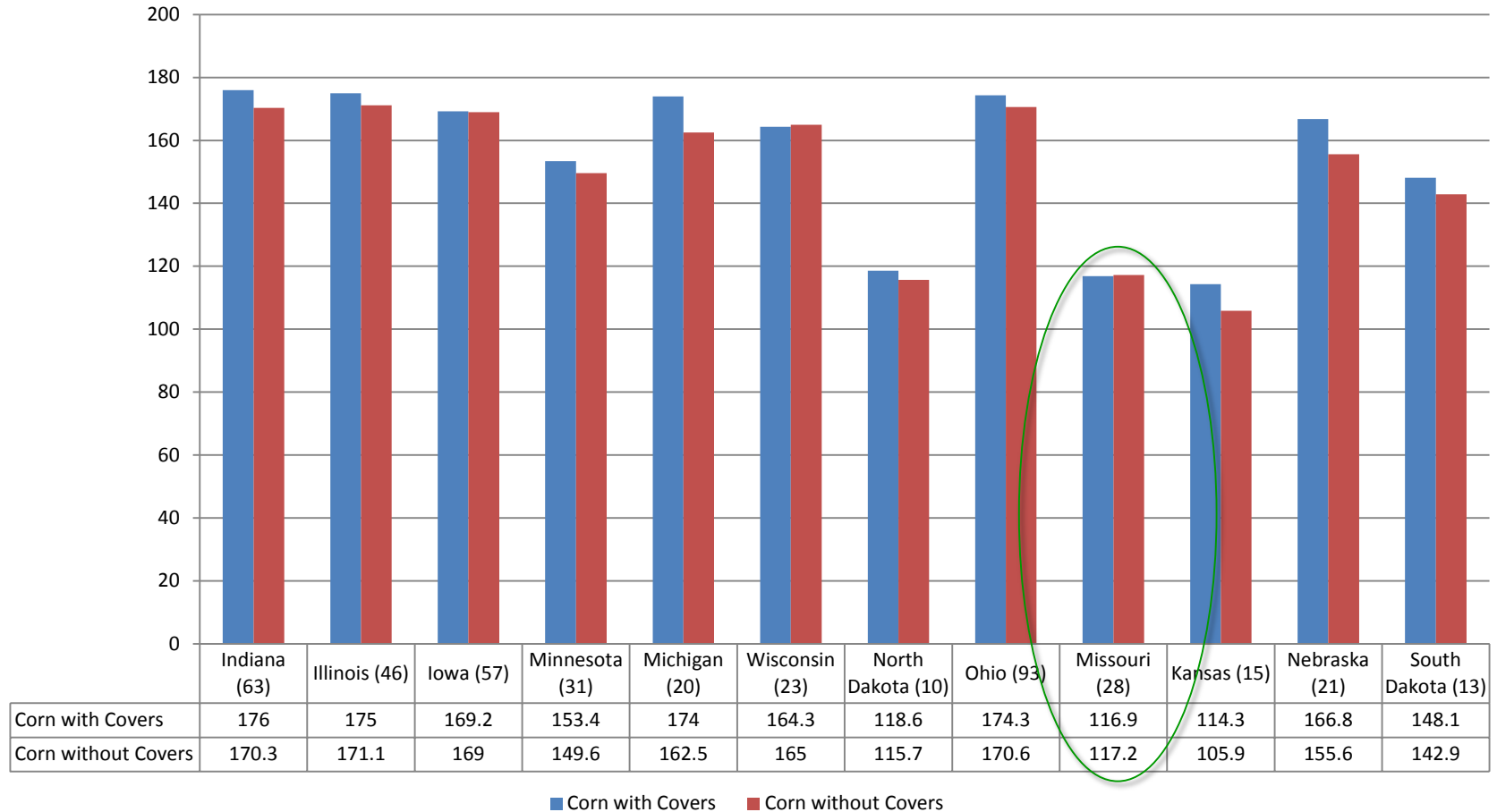
COVER CROP IMPACT ON CORN AND SOYBEAN YIELDS IN 2013



Impacts of Cover Crops on Corn and Soybean Yields in 2013

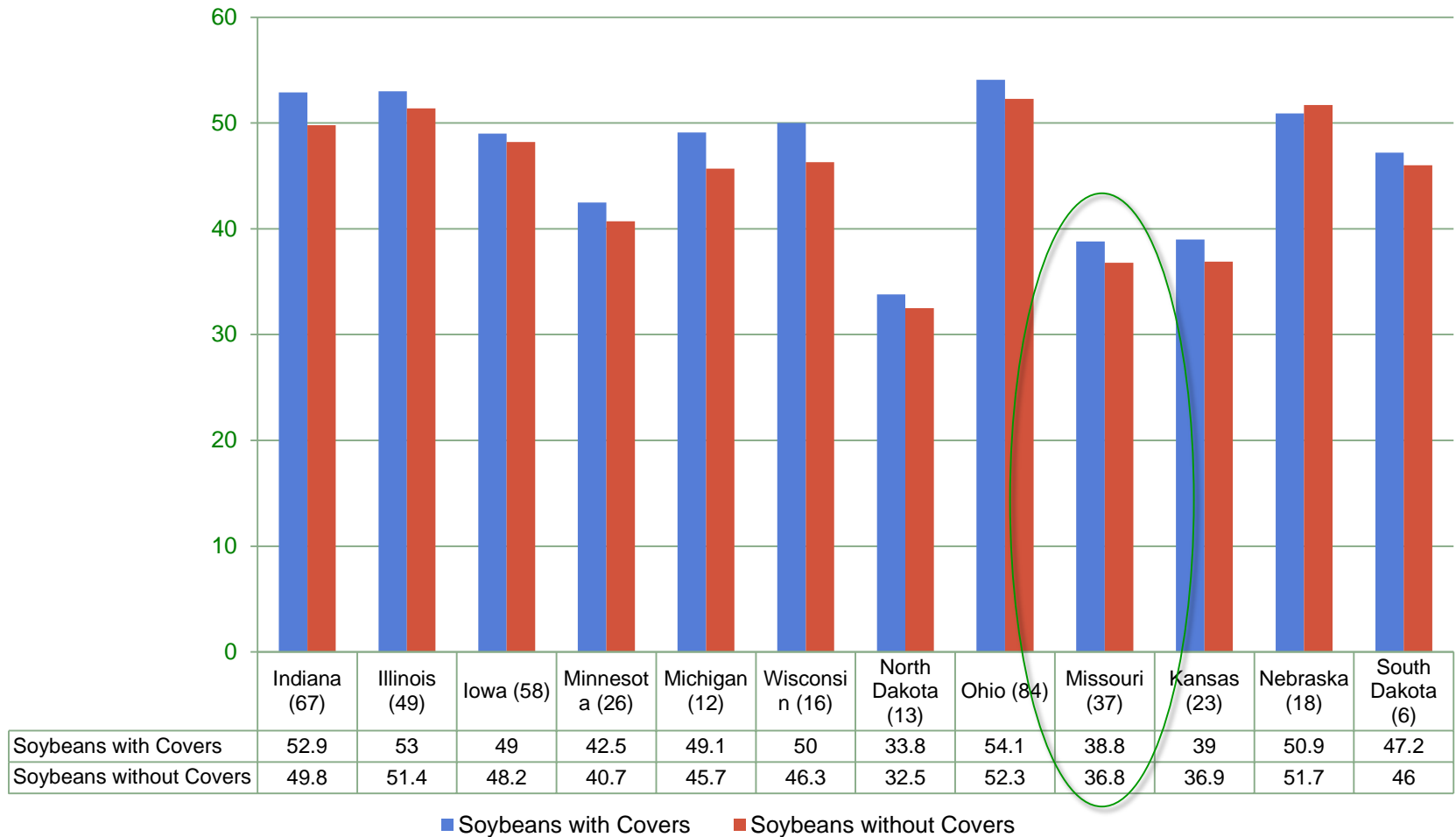


2013 Corn Yields by State



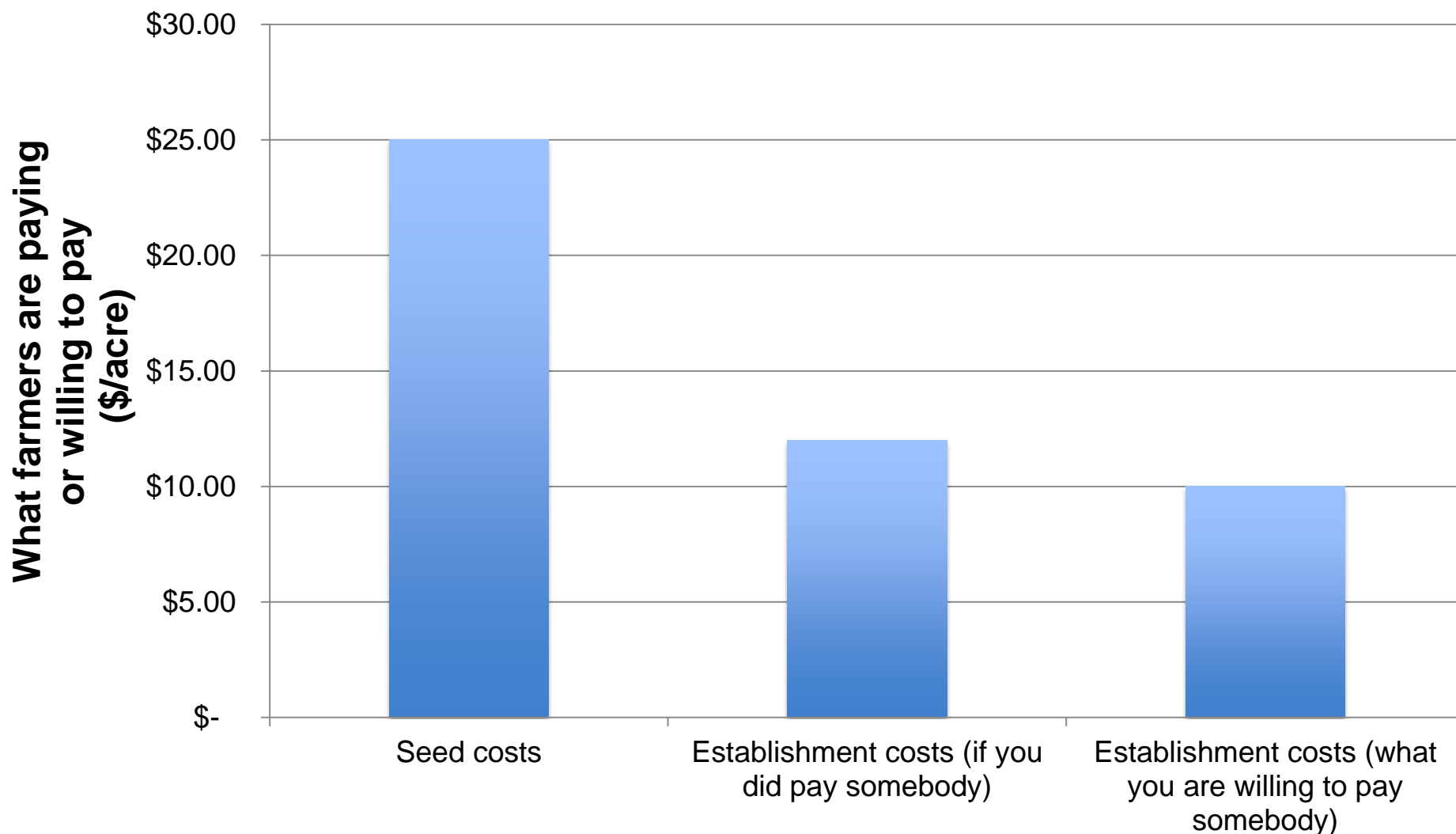
*Preliminary data from 2013-14
SARE/CTIC cover crop survey*

2013 Soybean Yields by State



*Preliminary data from 2013-14
SARE/CTIC cover crop survey*

Median Cover Crop Seeding Costs

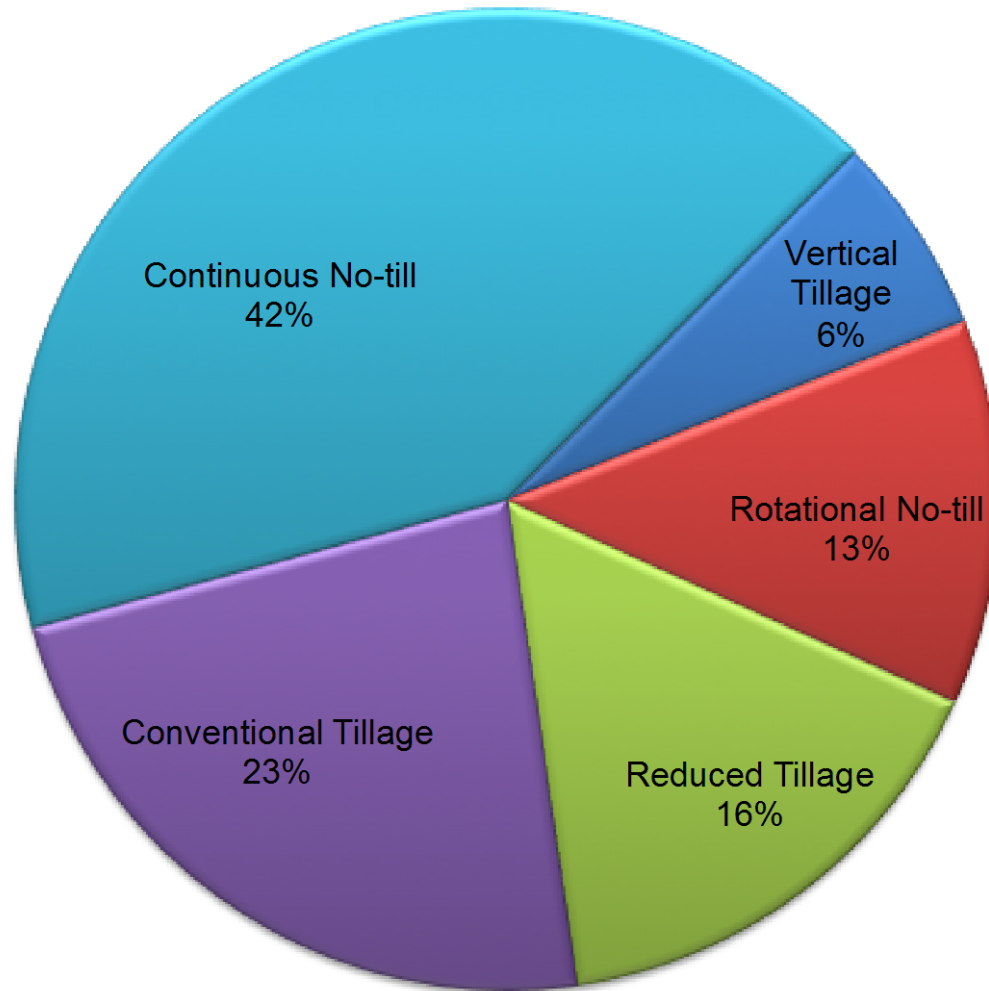


Preliminary data from 2013-14 SARE/CTIC cover crop survey

Do Cover Crops Pay?

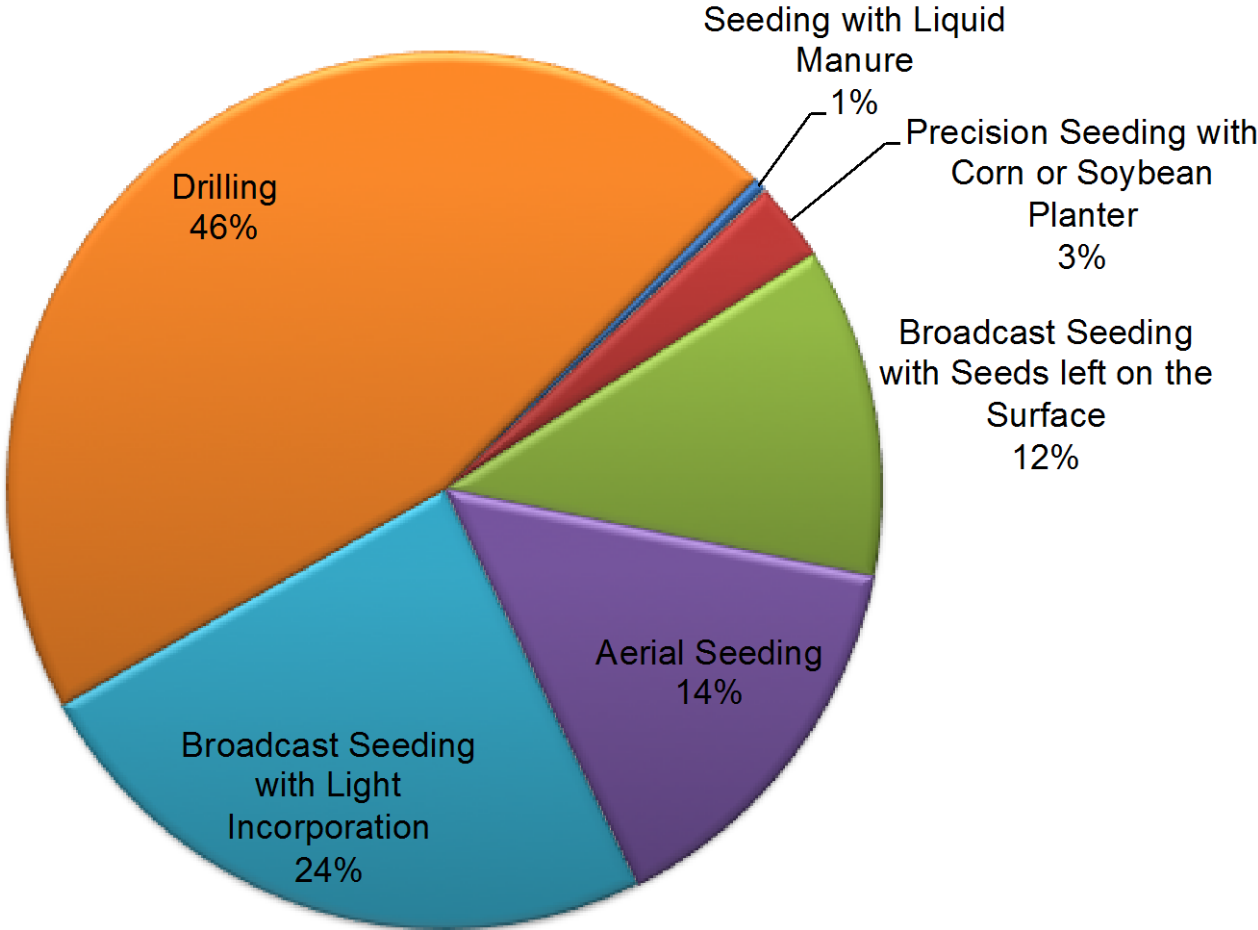
- Cover crop costs
 - Seed purchase, planting the seed, terminating the cover crop - typically \$30-50/acre
- Potential short-term returns from cover crops
 - Yield (farmers reported 3-12% yield boost in SARE/CTIC surveys last two years)
 - Assuming 5% yield increase, and using national average corn and bean yields in 2013 and average prices for 2013-14, generated \$35/acre return for corn and \$27/acre for soybeans
 - Nitrogen credit (depends on N application method and type of cover crop) - \$0-30/acre
 - Weed and other pest management – variable - \$0-15/acre
 - Grazing opportunities? Value of forage often \$50/acre or more
- Potential long-term returns from cover crops
 - Building the organic matter – helps with nutrients, soil moisture, and possibly land value
 - Reduced soil compaction and reduced pressure from some diseases
 - Improved soil health – improved yield and increased resiliency of the cropping system
 - Reduced erosion of soil and better soil tilth, helping with cash crop establishment
 - Overall change in management system may lead to lower production costs

Predominant Tillage System Used With Cover Crops in 2013



Preliminary data from 2013-14 SARE/CTIC cover crop survey

Primary Method of Seeding Cover Crops in 2013

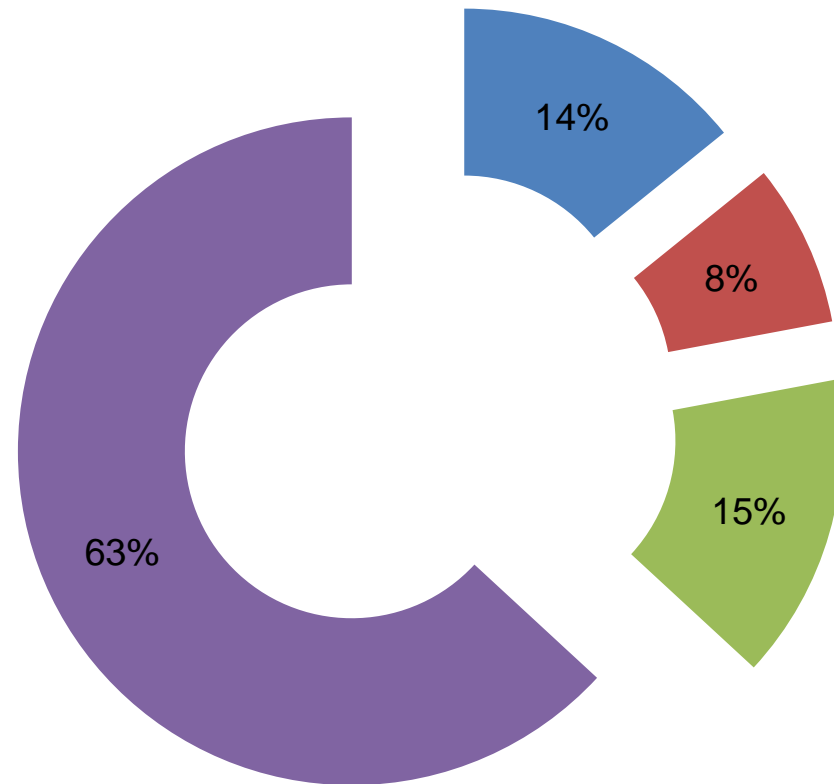


Preliminary data from 2013-14 SARE/CTIC cover crop survey

Cover crop cost share

How Financial Assistance is Used

- Yes - I initially received cost-share but now I largely self-fund
- Yes, I have only planted cover crops using financial assistance
- Yes, I have periodically received and used financial assistance
- No - I have not received financial assistance to plant cover crops



What's up with cover crops around the Corn Belt?



High clearance cover crop broadcast seeder









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Photo credit Joel Gruver, Western Illinois University



Photo credit Joel Gruver, Western Illinois University

Planting soybeans directly into standing cereal rye (Bradford Farm)



Timing the termination of cover crops

- NRCS has termination guidelines that affect crop insurance eligibility
- Some cover crops (eg., legumes) may need more than glyphosate for control
- Timing of spraying needs to take soil moisture into account
- Annual ryegrass in particular needs careful management



Photo credit: Nelson Family Farm

Planting beans into standing cereal rye



Photo credit – Dave Robinson

Soybeans emerging in killed cereal rye



Photo credit – Dave Robinson



Grazing of Cover Crops



Beef cattle grazing cover crops, farm of Steve Groff, Lancaster, PA

What cover crop farmers would tell their neighbor

- It is a systems approach based on a return to the way nature is intended to work and therefore can be extremely successful.
- If you expect to be able to farm your land in 50 years, or have your child or grandchild farm it, then you need to use cover crops.
- There is a wide array of cover crops that can improve every rotation and soil with a little bit of planning.
- Keeping the soil covered year-round provides food for the life in the soil, which in turn provides nutrients for your crops.
- We must take better care of the soil we depend on.

Thanks! Visit www.sare.org/covercrops

