The value of Indiana’s agricultural sector is the tenth-largest in the United States, and farms cover nearly two-thirds of the state’s total land area.1 Top crop commodities, including corn and soybeans, generate billions of dollars in income annually for farmers throughout the state. While Indiana planted more cover crops in 2012 than any other state but Texas,2 there are additional opportunities for Indiana farmers to plant more cover crops to maintain the strength of the Hoosier State’s agricultural sector, build soil health, and improve their ability to weather future droughts and floods.

IMPORRNTANCE OF THE AGRICULTURAL SECTOR
In 2014, Indiana’s farms and ranches produced nearly $14 billion in agricultural goods and services.3 Of this total, $8.3 billion came from crops, $4.3 billion came from livestock, and the remainder came from farm-related income (e.g., forest products, rental of farm dwellings).4 Indiana’s top commodities include corn, soybeans, and hogs.5 Other major commodities include wheat, poultry, beef, and dairy.6

Agriculture and related industries in Indiana directly and indirectly generate approximately $44 billion in economic activity annually and support nearly 189,000 jobs.8 The grain and soybean industries generate 40 percent of these jobs.9 The contributions of agriculture also vary regionally throughout Indiana. The central, north central, northeast, and southwest regions of the state contribute the most to the agricultural economy, while the south central and southeast regions contribute the least due to a lack of high-quality farmland.10

EXTREME WEATHER AND CLIMATE CHANGE IMPACTS ON AGRICULTURE
Agriculture in Indiana has been heavily impacted by both floods and droughts. From 2012 to 2014, the state had 242 USDA county disaster declarations for drought or excessive heat.11 From 2010 to 2014, insured crop losses due to drought, heat, hot wind, extreme precipitation, and flooding events totaled nearly $1.6 billion.12 The 2012 drought, which affected nearly the entire U.S. Midwest, caused a 40 percent drop in corn production in Indiana.13 At the drought’s peak, more than 81 percent of the state was in severe to exceptional drought, and overall, more than $1 billion in crop insurance was paid out for drought impacts on corn, soybeans, and wheat that year.14 Major floods have also inflicted significant damage to the state’s agriculture. Severe floods cost farmers $840 million in lost farm revenue in 2008.15 In 2015, heavy rains and subsequent flooding destroyed as much as 5 percent of the state’s corn and soybean crops, causing approximately $300 million in crop damage.16

Table I. Indiana’s Top 5 Crop Commodities by Value in 2014

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>$3.9 billion</td>
</tr>
<tr>
<td>Soybeans</td>
<td>$3.2 billion</td>
</tr>
<tr>
<td>Hay</td>
<td>$281 million</td>
</tr>
<tr>
<td>Wheat</td>
<td>$131 million</td>
</tr>
<tr>
<td>Melons</td>
<td>$27 million</td>
</tr>
</tbody>
</table>

For more information, please contact:

Ben Chou  
bchou@nrdc.org  
switchboard.nrdc.org/blogs/bchou

Claire O’Connor  
caconnor@nrdc.org  
switchboard.nrdc.org/blogs/coconnor

Lara Bryant  
lbryant@nrdc.org  
switchboard.nrdc.org/blogs/lbryant

Additional information on this topic is available for download at www.nrdc.org/water/climate-ready-soil.asp
Climate change will most likely exacerbate drought and flood risks for Indiana’s agriculture. Spring and fall precipitation is expected to increase by 20 to 30 percent, with slight decreases expected in the summer. The frequency and intensity of extreme precipitation events are also expected to increase. Spring floods could delay planting, and extended dry periods coupled with hotter temperatures during summer could have a negative impact on crops. Additionally, these changing weather conditions are likely to adversely affect soil health, resulting in lower soil moisture and decreases in soil organic matter. Indiana is expected to see a dramatic increase in the average number of days each year above 95°F. Currently there are about two days per year above this temperature threshold in the state. This will likely increase to 8 to 30 days per year by mid-century and 21 to 92 days by the end of the century. The Indiana corn yields could decline by up to nearly 33 percent by mid-century and as much as 82 percent by the end of the century due to the effects of hotter temperatures and precipitation changes. More extreme heat will also reduce labor productivity in “high risk” sectors like agriculture, where workers spend significant time outdoors.

Cover crops can also help farmers cope with the increased weed pressures associated with a shifting growing season, as well-managed cover crops can be used to suppress unwanted weeds. Further, cover crops have been shown to increase yields: during the 2012 drought, cover crops demonstrated their ability to build agricultural resiliency by providing the greatest yield benefit in areas that were hardest hit by extremely dry weather. Cover crops can also help to reduce emissions of greenhouse gases that contribute to climate change by sequestering carbon and reducing the need for synthetic fertilizers, whose production and transport result in more greenhouse gas emissions. Growing cover crops on half of Indiana’s corn and soybean acres could reduce greenhouse gas emissions by nearly 2.1 million metric tons each year—the equivalent of taking more than 440,000 cars off the road.

Due in part to greater emphasis on cover crops by several state and local agencies, Indiana is ahead of other states when it comes to cover crop adoption. In 2012, nearly 600,000 acres of cover crops were planted—the second-highest state total in the nation. However, cover crops remain vastly underutilized: 600,000 acres constitutes less than 5 percent of Indiana’s total cropland. Cover crops and other soil stewardship practices can help to improve the health of soils and make farmers more resilient to growing extreme weather risks.

COVER CROPS CAN HELP COMBAT THE PRESSURES OF CLIMATE CHANGE ON INDIANA AGRICULTURE

To manage the increased challenges associated with climate change, Indiana farmers can turn to practices that build soil health, like cover cropping. Cover crops have been shown to increase soil’s water-holding capacity, allowing farmers to capture more water from heavy rainfall events and store that water for increasingly hot summer days. In fact, using cover crops (and other soil stewardship practices, like no-till farming and compost application) to increase soil organic matter on just half of Indiana’s corn and soybean acres could help store an additional 113 billion gallons of water—enough to meet the needs of more than 3.5 million people for a year.

Indiana is widely credited for being a pacesetter in the Midwest when it comes to growing cover crops. The secret for success appears to be strong leadership and cooperation from local farmers, the Indiana Association of Soil and Water Conservation Districts, multiple state agencies, the Natural Resources Conservation Service, and Purdue University Extension, among other organizations. The Conservation Cropping Systems Initiative (CCSI), a partnership among these organizations, focuses on improving soil health. CCSI has created four regional hubs in Indiana to better conduct outreach to farmers and coordinate data collection for best management practices and soil indicators. CCSI advocates for the use of four primary conservation practices (continuous no-till/strip-till, cover crops, precision farming, and nutrient and pesticide management) to improve soil health, water quality, and increase profits. More than 8,000 producers have been reached in 131 meetings, and since the initiative began in late 2009, the cover crop acreage in the state has increased by 400 percent.
ENDNOTES


2 Calculated using Quick Stats 2.0 from 2012 Census of Agriculture, National Agricultural Statistics Service, U.S. Department of Agriculture (USDA), quickstats.nass.usda.gov/?source_desc=CENSUS.


5 Ibid.

6 Ibid.

7 Ibid.

8 Slaper, Kinghorn, and Otruzar, “Beyond the Farm,” at 1.

9 Ibid.

10 Ibid., at 7-8.


13 Slaper, Kinghorn, and Otruzar, “Beyond the Farm,” at 3.


19 Ibid., at I.


21 Purdue Climate Change Research Center, “Impacts of Climate Change,” at 3.

22 Ibid., at II.


24 “Heat in the Heartland,” at 17.

25 Ibid., at 18.


27 Ibid.


33 See Appendix for explanation of methodology.

