

PROGRESS REPORT:

Adoption of Soil Health Systems Based on Data from the 2017 U.S. Census of Agriculture

Metrics include Cover Crop and No-till Production Practices



SOIL HEALTH
INSTITUTE

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Data in this report is from the USDA Census of Agriculture, both the 2017 and 2012 reports. Analysis was written by Rob Myers, Ph.D., Co-chair of the Soil Health Institute Policy Action Team. Data tables and maps were prepared by Joe LaRose and Rob Myers, both of University of Missouri. Dr. Myers' email is myersrob@missouri.edu.

SUMMARY OF THE CENSUS OF AGRICULTURE AND SOIL HEALTH-PROMOTING PRACTICES

The 2017 Census of Agriculture was released by the U.S. Department of Agriculture on April 11, 2019. The Census represents the most thorough overall assessment of a number of agricultural metrics that is conducted in the U.S. Due to the time and expense involved with the Census, it is conducted only once every five years. Periodically, new questions are added, such as a question on cover crop acres that appeared for the first time in 2012 and was repeated in 2017.

In relation to soil health-promoting practices, the main data that the Census provides is on use of cover crops and tillage. Census respondents were asked how many acres of cover crops they planted in 2017 (and 2012), and from that response, the number of farm operations with cover crops was also determined. For tillage, respondents were asked how many acres they had of no-till, conservation tillage, or conventional tillage. It was up to the respondent to determine which tillage category various fields fit into. The number of no-till acres reported seems to indicate that a fair amount of rotational no-till was counted along with continuous no-till.

This report provides several tables and maps that were generated by extracting data from the online Census of Agriculture data sets and then analyzing or ranking the data to provide insights into progress with soil health practices, specifically cover crops and no-till.

ABOUT THE AUTHORS

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PROGRESS MADE WITH COVER CROPS FROM 2012 TO 2017

Cover crop acreage grew rapidly between the Census years of 2012 and 2017, reflecting information seen in other data sources and reported by cover crop seed companies and farmers themselves. A few highlights from the Census data:

- Cover crop acres increased from 10.3 million acres in 2012 to 15.4 million acres in 2017, a 50% increase



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- Eight states more than doubled their cover crop acreage from 2012 to 2017
- The number of farm operations with cover crops increased by 15.2% from 2012 to 2017, to a total of 153,402

Although the number of farm operations with cover crops significantly increased, the growth rate was even faster in the number of cover crop acres per farm, showing that once farmers got started with cover crops, they kept multiplying their acreage. Many western states had significant numbers of farm operations using cover crops, disproving the myth that cover crops can't be used in dry areas. For example, more than 21,000 farms in the Great Plains states of ND, SD, NE, OK and TX used cover crops in 2017. Even drier states like Montana, Colorado, Idaho, and New Mexico each had a thousand or more farm operations using cover crops.

While acreage of cover crops was highest per state in Texas and the Midwest (10 of the top 12 states in cover crop acreage were from the Midwest), on a percent of row crop basis, the eastern Corn Belt ranked much higher. There were 9 states (MD, CT, VT, VA, PA, DE, RI, NH, and MA) that had more than 20% of their "available" cropland planted to cover crops, and 19 states that had over 10% cover crops (see details on page 14).

SNAPSHOT OF NO-TILL USE IN 2017

For the U.S. as a whole, 37% of reported tillage practice acres were no-till, which would include both continuous no-till and rotational no-till (rotational no-till refers to using no tillage after one crop, such as soybeans, but tilling after another crop in the rotation, such as after corn). The total no-till acres reported for 2017 was 104 million acres, an increase of about 8 million acres over what was reported in the 2012 Census. The biggest no-till states were in the Great Plains, with Kansas and Nebraska each having more than 10 million acres of reported no-till, and the Dakotas and Montana being around 8 million acres each. Iowa also had just above 8 million acres of reported no-till. However, the highest percentages of reported no-till were mostly located in the eastern Corn Belt, with Tennessee leading the way at 78.6%, followed by Maryland and Virginia. Montana was the highest of the western states at 73% no-till. Kentucky, Pennsylvania, and West Virginia, were next highest.

TRENDLINES OF FURTHER ADOPTION OF SOIL HEALTH PRACTICES

Between 2012 and 2017, cover crop acres grew by an average of 8.4% a year compounded annually. If that growth rate continued, by the time of the next Census in 2022, there would be 23 million acres of cover crops. Within a decade, in 2029, there would be 40.5 million acres of cover crops. Notably, when evaluated by size of farm, cover crop adoption grew much faster among larger farms than smaller farms, probably reflecting the fact that vegetable farmers have been using cover crops for longer than many grain farmers. Among farms with at least 200 acres of cover crops, the total cover crop acreage increased by 68% from 2012 to 2017.

The growth rate on the number of new farm operations using cover crops was more modest, growing by 15.2% between 2012 and 2017, to 153,402 farm operations. If that trend continued, there would be 176,719 farm operations using cover crops in 2022.

For no-till, growth in acres was more modest than cover crops, with an 8.3% increase from 2012 to 2017. Part of this slower growth rate may be the longer time period that no-till has been promoted and the much higher level of acceptance to begin with, considering there are more than 100 million acres of reported no-till in the Census.

LIMITATIONS TO THE DATA

The Census of Agriculture is a thorough and professionally-managed survey that reaches a high percentage of farmers in the U.S. It is rigorously evaluated for each result by USDA National Agricultural Statistics Services staff. However, not every farmer fills out every question, and answers to certain questions may depend on farmers’ interpretation of the question and recollection of the practices they used. In the case of the question on no-till, what one farmer considers no-till may have a different meaning for another farmer, and likewise with the term cover crops. Also, where cover crops are grazed, farmers may have reported that acreage elsewhere in the survey, possibly where questions were asked about grazing. Particular challenges arise in trying to determine which practices may have been used together, such as where no-till was used with cover crops, or how cover crops fit into overall cropping systems.

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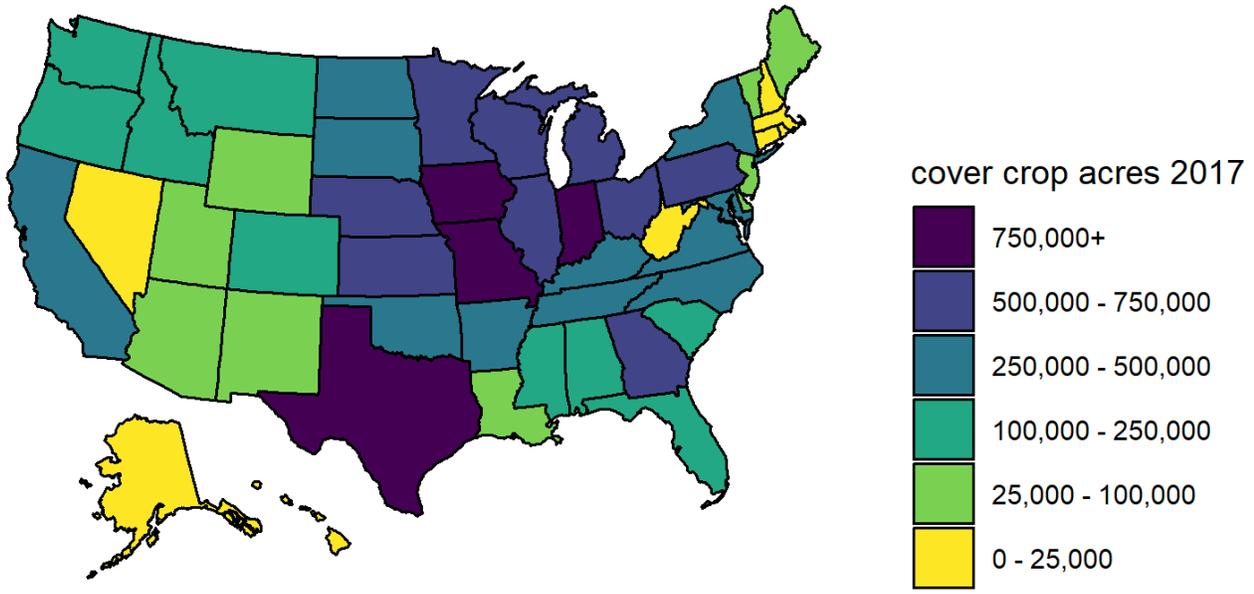


Figure 1. Map of cover crop acres planted by state in 2017 based on Census of Agriculture data. Specific numbers for each state are shown in Table 1 below.

Table 1. Planted cover crop acres* reported in the Census of Agriculture for 2017 and 2012, ranked by the 2017 acreage and showing percent increase for 2017 over 2012.

Rank	State	2017 Acres	2012 Acres	Percent Increase
1	Texas	1,014,145	911,061	11.3%
2	Iowa	973,112	379,614	156.3%
3	Indiana	936,118	596,062	57.1%
4	Missouri	842,178	390,114	115.9%
5	Nebraska	747,903	357,264	109.3%
6	Ohio	717,759	357,292	100.9%
7	Illinois	708,105	318,636	122.2%
8	Michigan	673,205	437,200	54.0%
9	Wisconsin	611,231	553,005	10.5%
10	Pennsylvania	595,309	446,295	33.4%
11	Minnesota	579,147	408,190	41.9%
12	Kansas	556,439	322,454	72.6%
13	Georgia	530,888	370,137	43.4%
14	North Carolina	482,934	393,002	22.9%
15	Kentucky	417,284	353,831	17.9%
16	Maryland	410,849	327,689	25.4%

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17	Virginia	409,862	301,959	35.7%
18	North Dakota	404,267	213,810	89.1%
19	California	350,436	340,532	2.9%
20	Oklahoma	342,564	227,541	50.6%
21	Tennessee	340,525	183,638	85.4%
22	New York	295,433	215,297	37.2%
23	South Dakota	281,649	149,383	88.5%
24	Arkansas	250,274	136,859	82.9%
25	Alabama	229,097	199,215	15.0%
26	Washington	175,909	178,401	-1.4%
27	Montana	151,523	128,183	18.2%
28	Florida	141,848	137,830	2.9%
29	Mississippi	139,639	66,069	111.4%
30	Colorado	129,820	126,293	2.8%
31	Idaho	128,963	103,467	24.6%
32	South Carolina	120,511	78,705	53.1%
33	Oregon	120,390	92,796	29.7%
34	Delaware	88,122	70,126	25.7%
35	Louisiana	72,646	59,206	22.7%
36	New Jersey	63,607	50,893	25.0%
37	Maine	55,462	29,379	88.8%
38	New Mexico	53,617	72,241	-25.8%
39	Wyoming	40,725	46,298	-12.0%
40	Vermont	40,555	20,120	101.6%
41	Arizona	39,518	17,704	123.2%
42	Utah	32,273	30,283	6.6%
43	West Virginia	22,417	16,747	33.9%
44	Connecticut	21,998	20,453	7.6%
45	Massachusetts	17,390	17,085	1.8%
46	Nevada	13,999	10,526	33.0%
47	New Hampshire	8,326	5,025	65.7%
48	Hawaii	7,533	7,021	7.3%
49	Rhode Island	2,308	2,537	-9.0%
50	Alaska	862	3,325	-74.1%
	U.S. total	15,390,674	10,280,793	49.7%

*The 2017 Census of Agriculture asked "how many acres were planted to a cover crop (cover crops are planted primarily for managing soil fertility, soil quality, and controlling weeds, pests, and diseases), excluding CRP acres."

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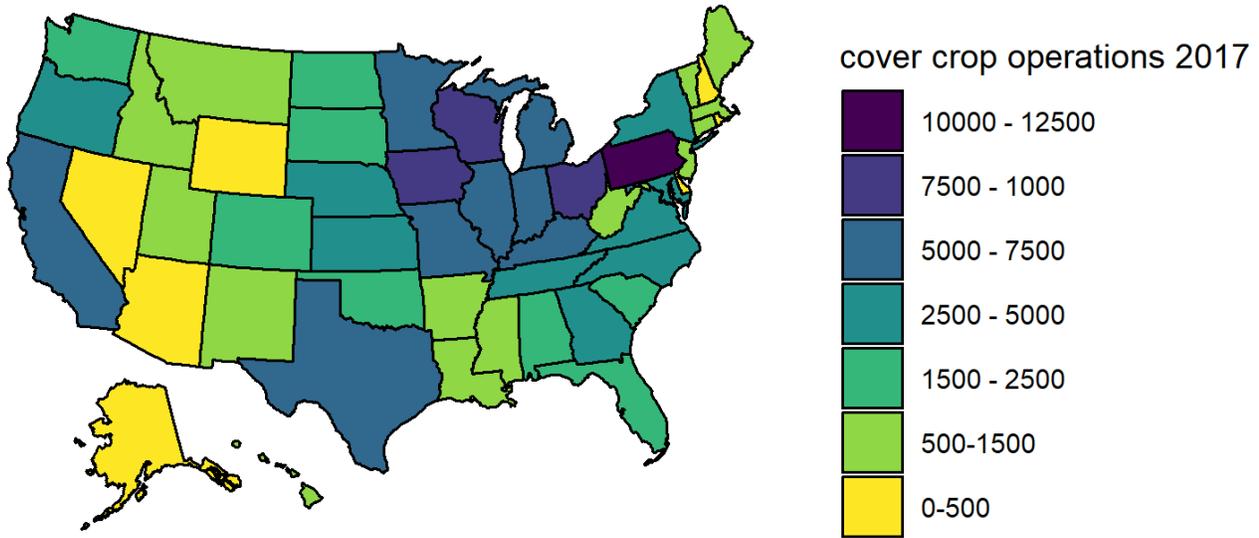


Figure 2. Map of farm operations with cover crops in 2017, based on Census of Agriculture.

Table 2. Number of farm operations reporting cover crop use by state, from the Census of Agriculture for 2017 and 2012, ranked by number of 2017 farm operations using cover crops and showing percent increase for 2017 over 2012.

Rank	State	2017	2012	Percent Increase
1	Pennsylvania	10,856	10,588	2.5%
2	Iowa	8,729	7,195	21.3%
3	Ohio	8,567	6,565	30.5%
4	Wisconsin	7,933	9,992	-20.6%
5	Kentucky	7,335	7,829	-6.3%
6	Texas	7,308	7,051	3.6%
7	Michigan	6,275	5,530	13.5%
8	California	6,198	4,899	26.5%
9	Illinois	6,084	4,734	28.5%
10	Missouri	6,072	4,464	36.0%
11	Indiana	5,929	5,271	12.5%
12	Minnesota	5,302	5,661	-6.3%
13	North Carolina	4,930	4,405	11.9%
14	New York	4,517	3,912	15.5%
15	Nebraska	4,419	2,826	56.4%
16	Tennessee	4,377	3,385	29.3%
17	Virginia	4,034	3,745	7.7%
18	Georgia	3,340	2,235	49.4%
19	Kansas	3,256	2,498	30.3%

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20	Maryland	2,556	2,366	8.0%
21	Oregon	2,556	1,922	33.0%
22	Washington	2,301	2,035	13.1%
23	North Dakota	2,252	1,302	73.0%
24	Oklahoma	2,238	1,812	23.5%
25	South Dakota	2,154	1,369	57.3%
26	Alabama	2,040	1,798	13.5%
27	South Carolina	1,866	1,291	44.5%
28	Colorado	1,751	1,270	37.9%
29	Florida	1,573	1,239	27.0%
30	Idaho	1,362	1,099	23.9%
31	Mississippi	1,338	1,019	31.3%
32	Arkansas	1,269	991	28.1%
33	West Virginia	1,204	844	42.7%
34	New Jersey	1,189	1,050	13.2%
35	New Mexico	1,177	1,012	16.3%
36	Maine	1,161	928	25.1%
37	Montana	1,123	976	15.1%
38	Utah	952	793	20.1%
39	Massachusetts	907	973	-6.8%
40	Louisiana	815	591	37.9%
41	Vermont	808	686	17.8%
42	Connecticut	660	617	7.0%
43	Hawaii	514	367	40.1%
44	Delaware	490	393	24.7%
45	Wyoming	458	494	-7.3%
46	New Hampshire	445	384	15.9%
47	Arizona	340	362	-6.1%
48	Nevada	201	178	12.9%
49	Rhode Island	143	126	13.5%
50	Alaska	98	52	88.5%
	US TOTAL	153,402	133,124	15.2%

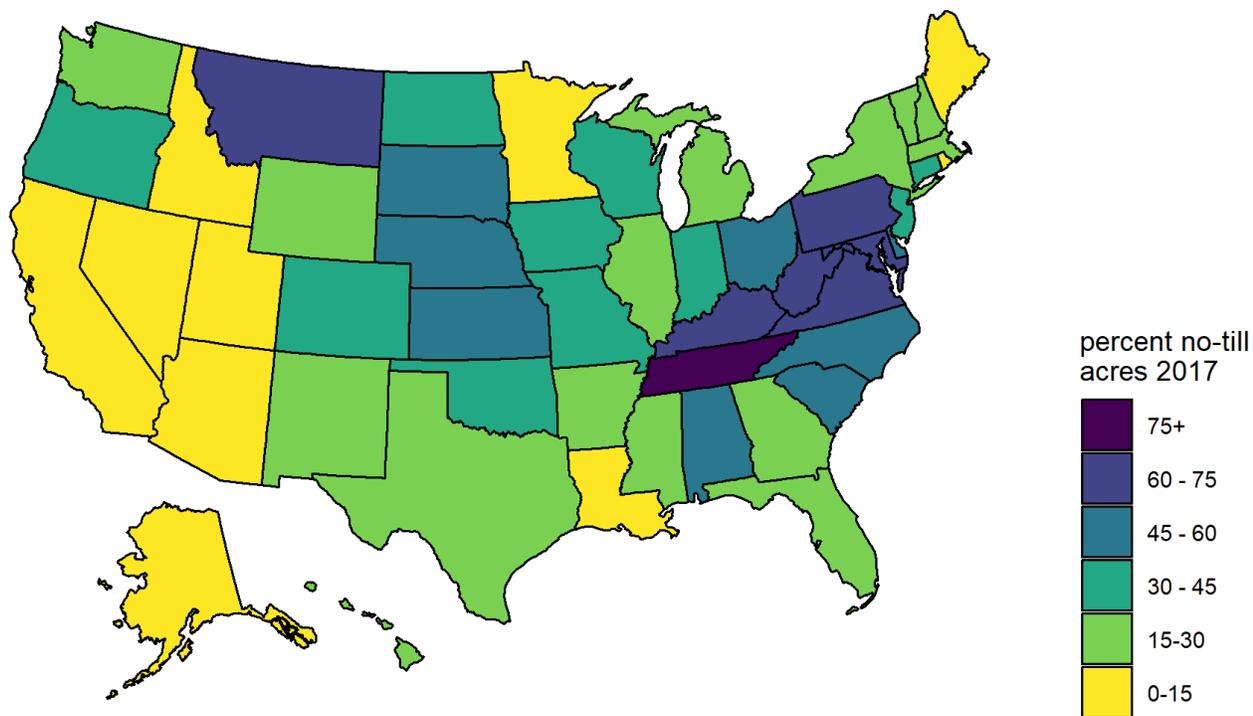


Figure 3. Map of the percent of each state managed with no-till in 2017 based on Census of Agriculture data.

Table 3. Percent of each state using no-till versus conventional or conservation tillage based on 2017 Census of Agriculture. Data shown for each state is ranked by percent no-till and includes acreage data of the three types of tillage systems that respondents were asked about.

Rank	State	Percent No-till	No-till Acres	Conventional Acres*	Conservation Acres
1	Tennessee	78.6%	2,342,696	251,843	384,849
2	Maryland	74.0%	826,999	97,850	192,692
3	Virginia	73.5%	1,021,330	129,607	237,949
4	Montana	73.2%	8,050,902	1,005,851	1,934,271
5	Kentucky	68.4%	2,398,002	440,151	669,980
6	Pennsylvania	67.2%	1,611,121	298,405	487,115
7	West Virginia	60.2%	68,191	28,901	16,102
8	Delaware	56.4%	242,599	77,772	109,487
9	Nebraska	56.2%	10,256,995	2,059,060	5,950,801
10	Alabama	53.2%	765,35	258,752	413,298
11	South Dakota	52.3%	7,656,188	2,674,782	4,300,330
12	North Carolina	50.6%	1,909,178	1,144,480	720,784
13	Kansas	47.8%	11,197,898	4,501,045	7,746,948

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14	Ohio	46.6%	4,268,627	1,782,034	3,104,619
15	South Carolina	46.4%	617,919	246,940	467,777
16	Missouri	45.0%	4,644,778	2,173,399	3,494,287
17	Colorado	41.7%	2,899,356	1,437,566	2,613,722
18	Indiana	41.4%	4,902,914	2,890,911	4,063,245
19	Oregon	40.9%	996,510	698,319	741,188
20	Connecticut	39.9%	18,153	18,812	8,479
21	New Jersey	38.8%	104,499	95,406	69,579
22	Oklahoma	36.0%	2,095,324	2,186,308	1,532,623
23	Iowa	35.1%	8,196,199	5,018,129	10,132,599
24	North Dakota	34.7%	7,778,463	5,601,446	9,052,235
25	Wisconsin	31.2%	2,227,504	2,069,420	2,836,372
26	Illinois	29.1%	6,471,985	6,293,661	9,454,154
27	Georgia	25.8%	748,083	1,104,329	1,045,149
28	Michigan	25.2%	1,566,334	2,343,703	2,297,131
29	Washington	25.0%	1,174,102	1,442,767	2,081,326
30	New Hampshire	24.7%	4,714	8,868	5,535
31	Vermont	24.4%	28,290	53,646	33,840
32	Wyoming	22.2%	150,102	344,255	181,377
33	Massachusetts	21.0%	9,152	23,868	10,481
34	Florida	19.8%	244,994	802,923	189,212
35	New Mexico	18.9%	138,401	374,685	218,922
36	New York	17.6%	337,968	798,732	778,919
37	Mississippi	17.6%	637,181	1,626,283	1,364,356
38	Arkansas	16.8%	988,557	2,722,427	2,172,603
39	Hawaii	16.2%	3,501	14,631	3,494
40	Texas	15.1%	2,423,028	8,706,646	4,952,395
41	Idaho	14.7%	513,984	1,992,641	979,587
42	Rhode Island	14.6%	864	4,406	644
43	Nevada	14.5%	19,480	89,781	25,288
44	Maine	14.2%	21,676	99,167	31,953
45	Utah	13.9%	65,470	270,879	135,486
46	Louisiana	13.1%	416,807	1,419,264	1,352,036
47	Alaska	12.3%	2,001	7,234	7,088
48	Arizona	9.3%	58,173	397,876	172,660
49	California	7.1%	238,454	2,376,172	763,991
50	Minnesota	5.8%	1,091,337	9,499,259	8,214,896
	US TOTAL	37.0%	104,452,339	80,005,292	97,753,854

*The 2017 Census of Agriculture asked about whether the following tillage practices were used and on how many acres: no-till, reduced (conservation) tillage, and intensive (conventional) tillage. The parenthetical explanations as listed are exactly what was listed in the Census.

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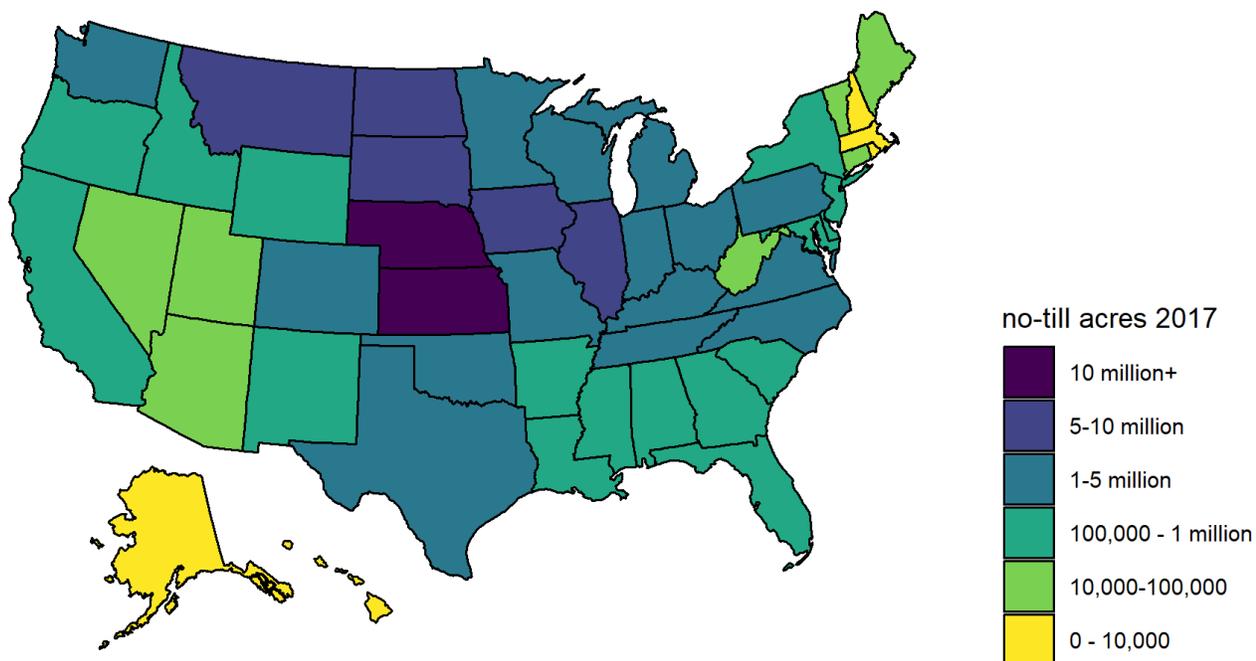


Figure 4. Map of no-till acres in each state for 2017 based on Census of Agriculture data.

Table 4. No-till acres by state reported in the Census of Agriculture for 2017 and 2012, ranked by the reported 2017 acreage and showing percent increase for 2017 over 2012.

Rank	State	2017	2012	Percent Increase
1	Kansas	11,197,898	10,403,753	7.6%
2	Nebraska	10,256,995	9,360,482	9.6%
3	Iowa	8,196,199	6,950,836	17.9%
4	Montana	8,050,902	6,859,498	17.4%
5	North Dakota	7,778,463	7,848,203	-0.9%
6	South Dakota	7,656,188	7,158,414	7.0%
7	Illinois	6,471,985	6,050,291	7.0%
8	Indiana	4,902,914	4,952,131	-1.0%
9	Missouri	4,644,778	4,017,507	15.6%
10	Ohio	4,268,627	4,278,556	-0.2%
11	Colorado	2,899,356	2,760,309	5.0%
12	Texas	2,423,028	2,576,585	-6.0%
13	Kentucky	2,398,002	2,307,738	3.9%
14	Tennessee	2,342,696	2,107,159	11.2%
15	Wisconsin	2,227,504	1,770,594	25.8%

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16	Oklahoma	2,095,324	2,334,778	-10.3%
17	North Carolina	1,909,178	1,878,617	1.6%
18	Pennsylvania	1,611,121	1,379,252	16.8%
19	Michigan	1,566,334	1,518,492	3.2%
20	Washington	1,174,102	805,517	45.8%
21	Minnesota	1,091,337	818,754	33.3%
22	Virginia	1,021,330	955,387	6.9%
23	Oregon	996,510	712,518	39.9%
24	Arkansas	988,557	981,157	0.8%
25	Maryland	826,999	767,813	7.7%
26	Alabama	765,356	709,853	7.8%
27	Georgia	748,083	699,406	7.0%
28	Mississippi	637,181	620,535	2.7%
29	South Carolina	617,919	538,758	14.7%
30	Idaho	513,984	467,634	9.9%
31	Louisiana	416,807	479,652	-13.1%
32	New York	337,968	280,214	20.6%
33	Florida	244,994	193,495	26.6%
34	Delaware	242,599	219,138	10.7%
35	California	238,454	205,383	16.1%
36	Wyoming	150,102	91,953	63.2%
37	New Mexico	138,401	135,476	2.2%
38	New Jersey	104,499	88,180	18.5%
39	West Virginia	68,191	58,139	17.3%
40	Utah	65,470	43,106	51.9%
41	Arizona	58,173	28,727	102.5%
42	Vermont	28,290	10,336	173.7%
43	Maine	21,676	9,909	118.8%
44	Nevada	19,480	17,527	11.1%
45	Connecticut	18,153	11,818	53.6%
46	Massachusetts	9,152	5,379	70.1%
47	New Hampshire	4,714	1,908	147.1%
48	Hawaii	3,501	3,513	-0.3%
49	Alaska	2,001	1,280	56.3%
50	Rhode Island	864	836	3.3%
	US TOTAL	104,452,339	96,476,496	8.3%

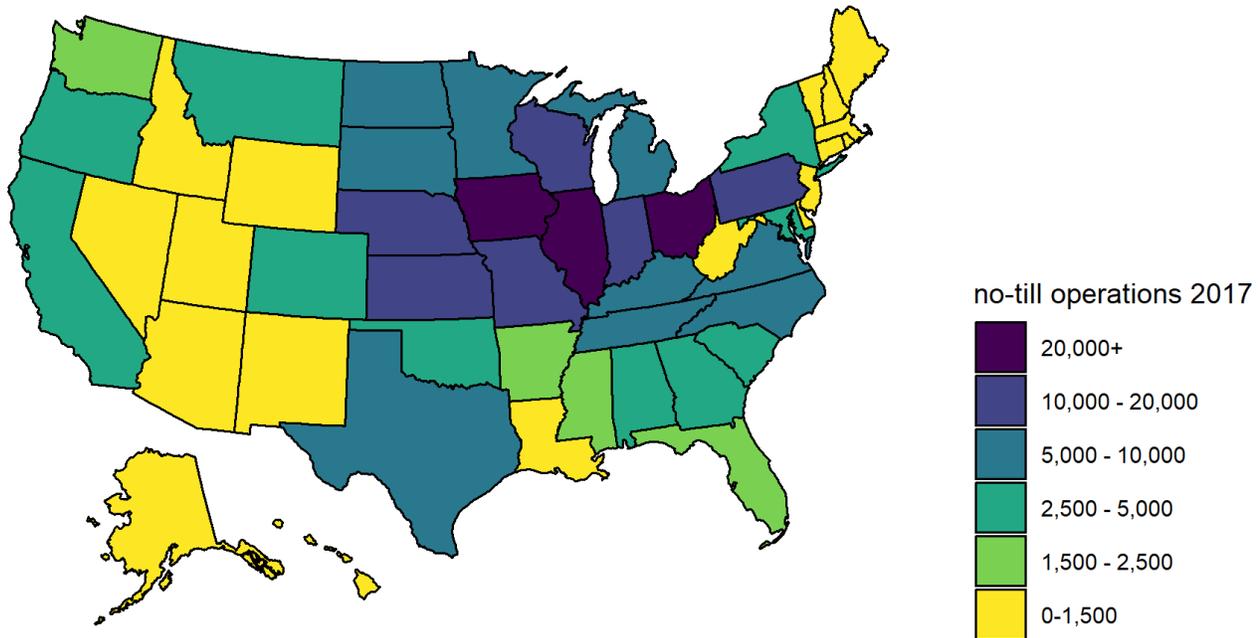


Figure 5. Map of farm operations with no-till in 2017, based on Census of Agriculture.

Table 5. Number of farm operations reporting no-till use by state, from the Census of Agriculture for 2017 and 2012, ranked by number of 2017 farm operations and showing percent increase for 2017 over 2012.

Rank	State	2017	2012	Percent Increase
1	Iowa	24,025	22,621	6.2%
2	Illinois	21,979	22,098	-0.5%
3	Ohio	20,537	20,712	-0.8%
4	Nebraska	17,389	18,175	-4.3%
5	Kansas	16,283	17,123	-4.9%
6	Indiana	15,867	16,693	-4.9%
7	Wisconsin	14,665	14,477	1.3%
8	Missouri	14,555	15,606	-6.7%
9	Pennsylvania	14,295	13,937	2.6%
10	Kentucky	9,212	10,341	-10.9%
11	Texas	8,384	9,294	-9.8%
12	Michigan	8,174	8,015	2.0%
13	South Dakota	7,774	7,462	4.2%
14	North Carolina	7,222	7,387	-2.2%
15	Tennessee	6,361	6,059	5.0%
16	Minnesota	5,815	4,701	23.7%

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17	North Dakota	5,548	6,097	-9.0%
18	Virginia	5,209	5,309	-1.9%
19	Oklahoma	4,778	5,668	-15.7%
20	Montana	4,106	4,241	-3.2%
21	California	3,880	4,213	-7.9%
22	Colorado	3,521	3,159	11.5%
23	New York	3,517	2,497	40.8%
24	Maryland	3,358	3,340	0.5%
25	Georgia	3,019	2,743	10.1%
26	Alabama	2,709	2,656	2.0%
27	South Carolina	2,535	2,234	13.5%
28	Oregon	2,502	1,935	29.3%
29	Washington	2,403	1,866	28.8%
30	Florida	2,077	1,304	59.3%
31	Arkansas	2,073	2,474	-16.2%
32	Mississippi	2,044	1,852	10.4%
33	Louisiana	1,350	1,468	-8.0%
34	New Mexico	1,338	1,311	2.1%
35	New Jersey	1,268	1,027	23.5%
36	Idaho	1,216	1,023	18.9%
37	Arizona	1,214	1,531	-20.7%
38	West Virginia	1,201	1,036	15.9%
39	Utah	920	570	61.4%
40	Delaware	760	705	7.8%
41	Massachusetts	679	406	67.2%
42	Hawaii	670	1,012	-33.8%
43	Maine	645	387	66.7%
44	Wyoming	575	397	44.8%
45	Vermont	502	322	55.9%
46	Connecticut	487	310	57.1%
47	New Hampshire	321	233	37.8%
48	Nevada	218	178	22.5%
49	Rhode Island	101	51	98.0%
50	Alaska	89	34	161.8%
	US TOTAL	279,370	278,290	0.4%

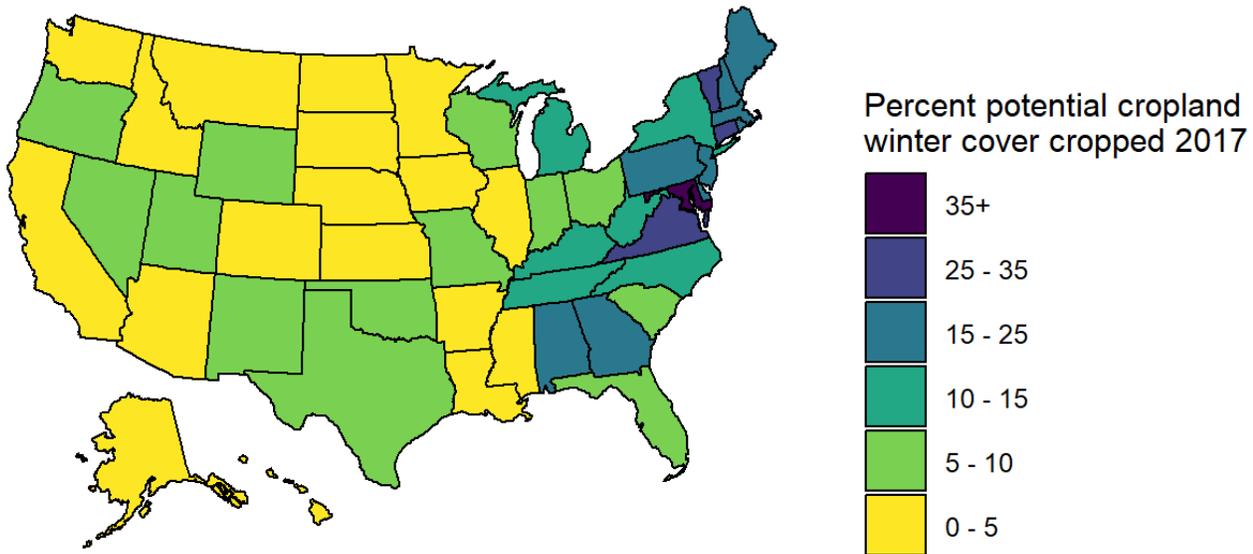


Figure 6. The percent of available cropland planted to cover crops by state for 2017. Cropland is based on 2017 Census of Agriculture data, with “available cropland” equaling total cropland reported in the Census (396.4 million acres) minus pastured cropland, hay land and haylage acres, and CRP/WRP acres (those categories total 93.6 million acres) minus harvested winter wheat acres (26.2 million acres). Winter wheat was excluded from the base on the presumption that winter annual cover crops would not be used where winter wheat was grown (of course some summer crops could be used after winter wheat harvest, or in the fallow areas of the west, but such use is relatively minor in nearly all states).

Table 6. The percent of available cropland planted to cover crops, by state for 2017. Includes data for total harvest cropland, hay and haylage acres, harvested winter wheat acres, and planted cover crop acres. Percent of available cropland planted to cover crops is calculated on the basis described above for figure 6.

State	Total cropland acres for 2017	Combined pasture, hay, and CRP acres	Winter wheat acres harvested	Acres available for planting cover crops*	Cover crop acres	Percent of available cropland planted to cover crops
Alabama	2,818,783	1,263,078	102,624	1,453,081	229,097	15.8%
Alaska	83,732	44,116		39,616	862	2.2%
Arizona	1,286,648	463,774		822,874	39,518	4.8%
Arkansas	7,825,947	1,727,740	124,698	5,973,509	250,274	4.2%
California	9,597,439	2,084,410	169,018	7,344,011	350,436	4.8%
Colorado	11,056,259	3,651,586	2,054,053	5,350,620	129,820	2.4%

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Connecticut	148,609	79,263		69,346	21,998	31.7%
Delaware	452,211	21,307	48,573	382,331	88,122	23.0%
Florida	2,825,803	758,731	8,049	2,059,023	141,848	6.9%
Georgia	4,372,134	1,054,233	69,740	3,248,161	530,888	16.3%
Hawaii	191,175	14,894		176,281	7,533	4.3%
Idaho	5,894,676	2,275,697	720,308	2,898,671	128,963	4.4%
Illinois	24,003,086	1,503,092	476,433	22,023,561	708,105	3.2%
Indiana	12,909,673	865,585	239,221	11,804,867	936,118	7.9%
Iowa	26,545,960	3,012,440	8,534	23,524,986	973,112	4.1%
Kansas	29,125,505	4,945,767	7,003,947	17,175,791	556,439	3.2%
Kentucky	6,630,448	2,689,086	344,575	3,596,787	417,284	11.6%
Louisiana	4,345,843	923,881	12,335	3,409,627	72,646	2.1%
Maine	472,508	194,448	262	277,798	55,462	20.0%
Maryland	1,426,671	259,892	164,831	1,001,948	410,849	41.0%
Massachusetts	171,496	85,681		85,815	17,390	20.3%
Michigan	7,924,480	1,235,847	486,142	6,202,491	673,205	10.9%
Minnesota	21,786,756	2,683,674	5,069	19,098,013	579,147	3.0%
Mississippi	4,960,620	1,427,449	26,523	3,506,648	139,639	4.0%
Missouri	15,599,446	4,858,457	552,829	10,188,160	842,178	8.3%
Montana	16,406,300	4,666,572	1,610,795	10,128,933	151,523	1.5%
Nebraska	22,242,599	3,490,897	1,058,367	17,693,335	747,903	4.2%
Nevada	794,699	628,401		166,298	13,999	8.4%
New Hampshire	107,996	68,095		39,901	8,326	20.9%
New Jersey	463,019	124,179	17,534	321,306	63,607	19.8%
New Mexico	1,825,827	1,014,079	140,809	670,939	53,617	8.0%
New York	4,291,388	1,988,645	113,324	2,189,419	295,433	13.5%
North Carolina	5,000,685	835,623	413,466	3,751,596	482,934	12.9%
North Dakota	27,951,676	4,658,030	37,382	23,256,264	404,267	1.7%
Ohio	10,960,704	1,499,899	462,579	8,998,226	717,759	8.0%
Oklahoma	11,715,717	4,994,531		6,721,186	342,564	5.1%
Oregon	4,726,109	1,835,361	773,256	2,117,492	120,390	5.7%
Pennsylvania	4,651,210	1,929,653	146,685	2,574,872	595,309	23.1%
Rhode Island	17,654	7,348		10,306	2,308	22.4%
South Carolina	2,035,329	485,121	81,865	1,468,343	120,511	8.2%
South Dakota	19,813,517	4,328,546	542,013	14,942,958	281,649	1.9%
Tennessee	5,286,321	1,996,702	312,793	2,976,826	340,525	11.4%
Texas	29,360,229	10,822,756	2,496,076	16,041,397	1,014,145	6.3%

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Utah	1,654,371	1,070,268	132,709	451,394	32,273	7.1%
Vermont	479,680	334,782	354	144,544	40,555	28.1%
Virginia	3,084,067	1,448,178	151,869	1,484,020	409,862	27.6%
Washington	7,488,625	2,081,584	1,711,889	3,695,152	175,909	4.8%
West Virginia	947,710	736,703	4,485	206,522	22,417	10.9%
Wisconsin	10,085,021	2,781,763		7,303,258	611,231	8.4%
Wyoming	2,587,456	1,691,804	109,299	786,353	40,725	5.2%
U.S. Total	396,433,817	93,643,680	26,186,417	276,603,720	15,390,674	5.6%

*The calculation method used here is that “acres available for planting cover crops” = “total cropland” minus “hay and haylage acres” minus “CRP/WRP” acres minus “pastured cropland” minus “harvested winter wheat acres.” This is a simple but imperfect way of calculating land available for planting cover crops. It works well for most states, but not as well for a few western states that have fallow acres where cover crops are planted in the fallow year, effectively alternating with wheat years (and the wheat may be either spring wheat or winter wheat).

Table 7. Comparison of cover crop acres in relation to no-till acres in each state for 2017.

State	Cover crop acres	No-till acres	Ratio of cover crop to no-till acres
Alabama	229,097	765,356	0.30
Alaska	862	2,001	0.43
Arizona	39,518	58,173	0.68
Arkansas	250,274	988,557	0.25
California	350,436	238,454	1.47
Colorado	129,820	2,899,356	0.04
Connecticut	21,998	18,153	1.21
Delaware	88,122	242,599	0.36
Florida	141,848	244,994	0.58
Georgia	530,888	748,083	0.71
Hawaii	7,533	3,501	2.15
Idaho	128,963	513,984	0.25
Illinois	708,105	6,471,985	0.11
Indiana	936,118	4,902,914	0.19
Iowa	973,112	8,196,199	0.12
Kansas	556,439	11,197,898	0.05
Kentucky	417,284	2,398,002	0.17
Louisiana	72,646	416,807	0.17
Maine	55,462	21,676	2.56
Maryland	410,849	826,999	0.50
Massachusetts	17,390	9,152	1.90
Michigan	673,205	1,566,334	0.43
Minnesota	579,147	1,091,337	0.53
Mississippi	139,639	637,181	0.22
Missouri	842,178	4,644,778	0.18
Montana	151,523	8,050,902	0.02
Nebraska	747,903	10,256,995	0.07
Nevada	13,999	19,480	0.72
New Hampshire	8,326	4,714	1.77
New Jersey	63,607	104,499	0.61
New Mexico	53,617	138,401	0.39
New York	295,433	337,968	0.87
North Carolina	482,934	1,909,178	0.25

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North Dakota	404,267	7,778,463	0.05
Ohio	717,759	4,268,627	0.17
Oklahoma	342,564	2,095,324	0.16
Oregon	120,390	996,510	0.12
Pennsylvania	595,309	1,611,121	0.37
Rhode Island	2,308	864	2.67
South Carolina	120,511	617,919	0.20
South Dakota	281,649	7,656,188	0.04
Tennessee	340,525	2,342,696	0.15
Texas	1,014,145	2,423,028	0.42
Utah	32,273	65,470	0.49
Vermont	40,555	28,290	1.43
Virginia	409,862	1,021,330	0.40
Washington	175,909	1,174,102	0.15
West Virginia	22,417	68,191	0.33
Wisconsin	611,231	2,227,504	0.27
Wyoming	40,725	150,102	0.27
U.S. Total	15,390,674	104,452,339	0.15

Table 8. Ranking of states based on percent increase in cover crop acres from 2012 to 2017.

Rank	State	Percent Increase
1	Iowa	156.3%
2	Arizona	123.2%
3	Illinois	122.2%
4	Missouri	115.9%
5	Mississippi	111.4%
6	Nebraska	109.3%
7	Vermont	101.6%
8	Ohio	100.9%
9	North Dakota	89.1%
10	Maine	88.8%
11	South Dakota	88.5%
12	Tennessee	85.4%
13	Arkansas	82.9%
14	Kansas	72.6%
15	New Hampshire	65.7%
16	Indiana	57.1%
17	Michigan	54.0%
18	South Carolina	53.1%
19	Oklahoma	50.6%
20	Georgia	43.4%
21	Minnesota	41.9%
22	New York	37.2%
23	Virginia	35.7%
24	West Virginia	33.9%
25	Pennsylvania	33.4%

Rank	State	Percent Increase
26	Nevada	33.0%
27	Oregon	29.7%
28	Delaware	25.7%
29	Maryland	25.4%
30	New Jersey	25.0%
31	Idaho	24.6%
32	North Carolina	22.9%
33	Louisiana	22.7%
34	Montana	18.2%
35	Kentucky	17.9%
36	Alabama	15.0%
37	Texas	11.3%
38	Wisconsin	10.5%
39	Connecticut	7.6%
40	Hawaii	7.3%
41	Utah	6.6%
42	Florida	2.9%
43	California	2.9%
44	Colorado	2.8%
45	Massachusetts	1.8%
46	Washington	-1.4%
47	Rhode Island	-9.0%
48	Wyoming	-12.0%
49	New Mexico	-25.8%
50	Alaska	-74.1%

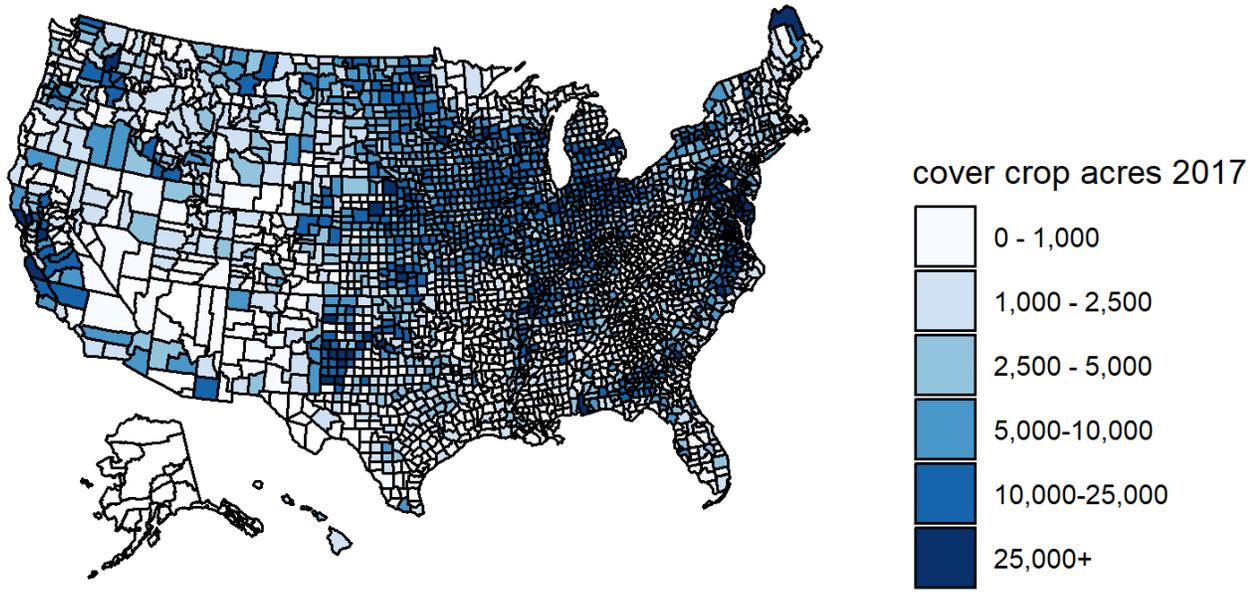


Figure 7. Map of cover crop acres planted by county in 2017. Data from the 2017 Census of Agriculture.

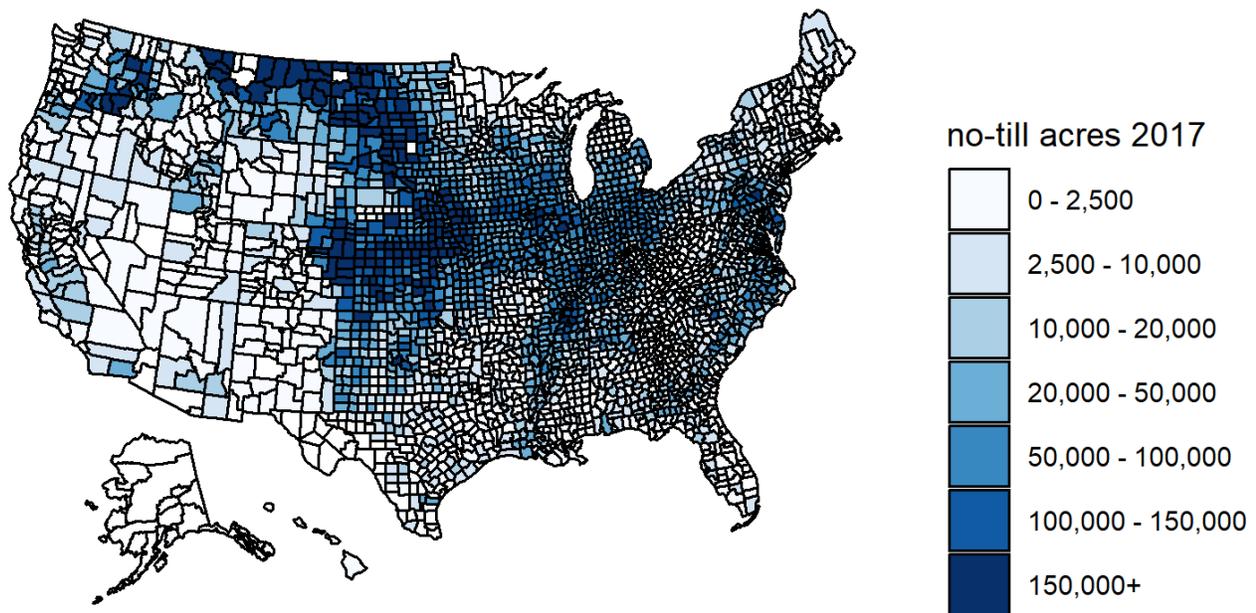


Figure 8. Map of no-till acres planted by county in 2017. Data from the 2017 Census of Agriculture.

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The Soil Health Institute is a non-profit that works with its many stakeholders to identify gaps in research and adoption; develop strategies, networks and funding to address those gaps; and ensure beneficial impact of those investments to agriculture, the environment and society.

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