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A Special Management Report From

Ag Equipment Intelligence

Benchmarking No-Till Farming in the U.S. – 2013

An *Ag Equipment Intelligence & No-Till Farmer* Staff Report

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SECTION 1 — INTRODUCTION

Benchmarking No-Till Farming in the U.S.

"No-till" farming has seen increases in acreage across all major crops, according to a recent report from the Economic Research Service (ERS) of the U.S. Department of Agriculture.

Approximately 35.5% of U.S. cropland (88 million acres) planted to eight major crops had no-tillage operations in 2009 (the latest data available), according to the ERS researchers who analyzed 2000-2007 data from USDA's Agricultural Resource Management Survey (ARMS). The crops — barley, corn, cotton, oats, rice, sorghum, soybeans and wheat — constituted 94% of total planted U.S. acreage in 2009.*

The agency estimates that no-till acres are growing by 1.5% a year, says John Horowitz, an economist with the USDA's Resource and Rural Economics Division.

Their research also found:

• No-till increased for corn, cotton, soybeans and rice (four crops for which ARMS data are sufficient for researchers to calculate a trend) at a median rate of roughly 1.5% per year. Across all crops, rates of conservation tillage in Southern states lag Northern rates.

• Soybean farmers had the highest percentage of planted acres with no-till (45.3% in 2006; projected at almost 50% in 2009).

•The Northern Plains region has the highest rate of conservation tillage for corn (64% in 2010) and the highest rates for wheat and soybeans.

• Cotton farmers practiced no-till on 20.7% of planted acres in 2007 (projected at 23.7% in 2009).

• Rice farmers had the lowest percentage of planted acres with no-till (11.8% in 2006; projected at 16.3% in 2009) among the major crops analyzed.

The Agricultural Resource Management Survey (ARMS) and the National Resources Inventory-Conservation Effects Assessment Project's (NRI-CEAP) Cropland Survey track growth and usage of no-till farming on a scheduled basis.

However, at the same time little has been done to benchmark no-till in actual farming operations.

Benchmarking No-Till

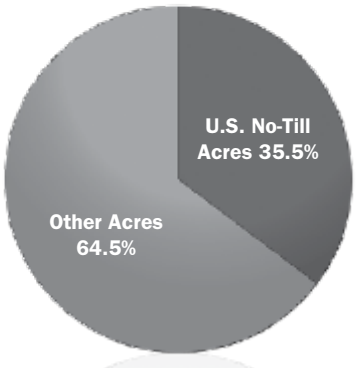
Starting in 2009, *No-Till Farmer*, a sister publication to *Ag Equipment Intelligence* at Lessiter Publications, began conducting its annual "No-Till Practices" survey. Its most recent study in February 2013 garnered responses from 603 farmers from the publication's paid circulation list.

The aim of the survey is to provide growers with meaningful operational benchmarks in the areas of cropping, land use, crop yield, seeding, crop protection, fertilizing and equipment data. It also produces quantitative information on no-till operating expenses and producer income.

In addition, the data resulting from the survey has also proven valuable to farm equipment manufacturers and companies that produce seed, fertilizer and crop protection products.

For this update to our 2011 special report, the editors of *Ag Equipment Intelligence* have added the last two years of data that was collected from *No-Till Farmer*'s 2012 and 2013 sur-

U.S. No-Till vs. Other Cropland Acres



Economic Research Service researchers estimate that approximately 35.5% of U.S. cropland (88 million acres) planted to eight major crops had no-tillage operations in 2009. They estimate no-till acres wil increase by 1.5% per year for the foreseable future.

Defining No-Till Farming

No-till farming is often included under the umbrella of conservation tillage, which covers a broad range of soil tillage systems. In no-till, a residue cover is left on the soil surface, substantially reducing the effects of soil erosion from wind and water. Besides no-till, other specific types of conservation tillage include minimum tillage, zone-tillage, ridge-till, mulch-till, reduced-till and strip-till.

With these approaches, the soil is left undisturbed from harvest to planting except for nutrient and chemical application. Weed control is accomplished primarily with herbicides, limited cultivation and with cover crops.

The Conservation Technology Information Center (CTIC)) specifies that 30% or more of crop residue must be left after planting to qualify as a conservation tillage system.

According to the USDA-NRCS report, Conservation Tillage and Crop Residue Management, "Reducing tillage operations improves soil surface properties, including improved soil aggregation accounting for increased infiltration and percolation; less compaction due to less usage of field implements; and more biological activity due to an increase in organic matter."

By leaving crop residue undisturbed for as long as possible, microbial and other biological activity in the soil feeds on the stalks, leaves and other crop residues. This increases organic matter, improves soil tilth and, ultimately, increases soil productivity, says the CTIC. Better soil retains more moisture for dry periods, yet the improved structure speeds natural infiltration in wet spots.

In addition, no-till reduces labor, equipment costs and fuel use, helping to increase producer profits. Conservation tillage is expected to increase rapidly over the next few years because of these reasons and its beneficial impact on the environment.

** "No-Till Farming is a Growing Practice," John Horowitz, Robert Ebel, Kohei Ueda, Economic Research Service, U.S. Dept. of Agriculture, Economic Information Bulletin Number 70, November 2010*

veys. More than 600 subscribers to *No-Till Farmer* responded to the 2013 survey and 520 no-tillers participated in the 2012 version. As in the past, Darrell Bruggink, executive editor and publisher of *No-Till Farmer* and the *Conservation Tillage Guide*, provides the analysis of the most recent survey results in Section 2 of this report.

Section 3 compiles all of the data gathered since 2008, providing year-to-year comparisons and significant trends that have taken place during the 6 years the survey has been conducted.

Planter Attachments No-Tillers Use 2013	
Closing Wheels	82%
Seed Firmer	80%
Row Cleaners	77%
Coulters	50%
Pop-Up Applicator	42%
2-By-2 Applicator	41%
Down-Pressure System	41%
Metering System	32%
Nitrogen Applicator	27%

No-tillers report they use a variety of planter attachments, but at 82% closing wheels are the most popular followed closely by seed firmers at 80% and row cleaners at 77%.

No-Till Equipment

Equipment purchases among the readers of *No-Till Farmer* saw a slight increase ahead of the 2013 growing season, marking growth in purchases for the second consecutive year.

Those equipment segments that saw an increase in purchases over a year ago included combines at 14% compared to 11% a year ago; tractors at 20% (vs. 19%); no-till drills at 10% (vs. 8%); and self-propelled sprayers at 10% (vs. 8%).

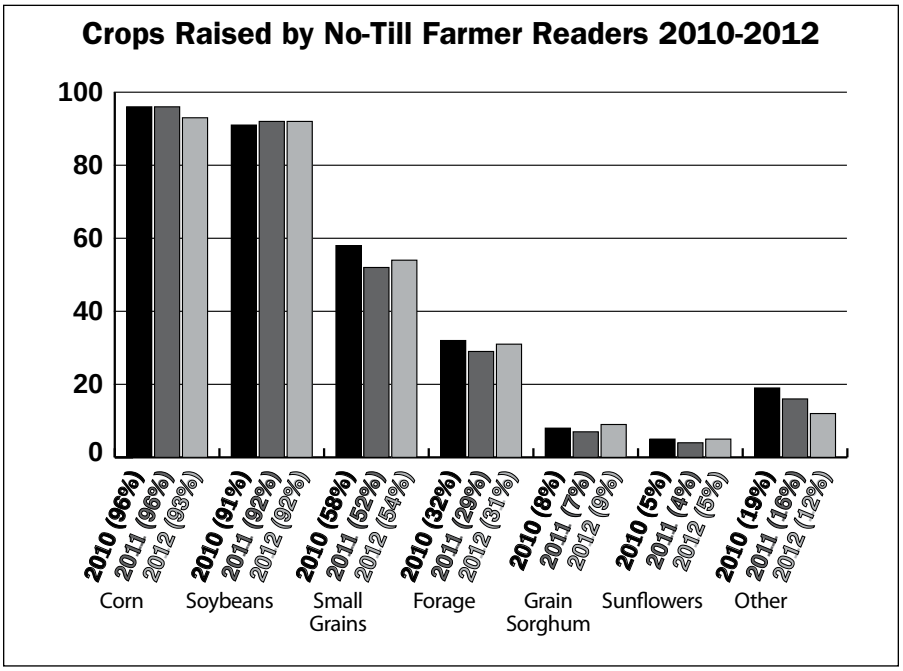
Segments that saw slight declines included planters at 15% (vs. 17%); tillage tools at 4% (vs. 6%); and pull-type sprayers at 3% (vs. 4%).

Some 94% of *No-Till Farmer* readers own and operate their own no-till planter. Another 82% own a combine; 81% own a sprayer, split between self-propelled at 56% vs. 44% for pull-type models; 73% own a no-till drill; 53% own a grain cart; and 39% own a fertilizer applicator.

No-Till Farmer readers were also asked what brand of planter they owned and operated to plant corn. In 2013, John Deere was owned by 50%, Kinze by 24%, White by 12%, Case IH by 9%, Great Plains by 3% and "others" accounted for 2%. Deere has slipped from a 55% market share among readers in 2011 to 51% in 2012.

Owned, Rented or Share-Cropped Acreage 2013 (Percentage of Total Acreage Within Each Category)	All	ECB	WCB	GL	NE	SP	NP	AP
Own	43%	39%	50%	47%	38%	40%	44%	39%
Cash Rent	40%	42%	32%	49%	61%	21%	50%	47%
Share Crop	17%	19%	18%	4%	1%	39%	6%	14%

Slightly more no-tillers own the acreage they farm than those who cash rent the land. However, in the Northeast over 60% of no-tillers rent their land.



Corn remains the most popular crop raised by no-tillers, however it dropped slightly from the 2011 report (93% in 2012 vs. 96% in 2011.) Soybeans are nearly as common with 92% of no-tillers raising them. Sunflowers are the crop raised least often by no-tillers at just 5% of total sunflower acreage.

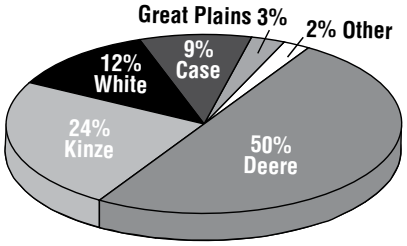
While 12- and 6-row units remain the most commonly used planters among no-tillers at 31% and 28%, respectively, combined they have fallen 6-percentage points from a year ago. The trend continues toward bigger planters, with 16 rows now at 24% and 24-row units at 8%.

Some 91% of no-tillers will plant corn in 30-inch rows, which is up 2% from 2012. Among planters of narrow-row corn, the 15-inch width is the most popular at 8% of no-tillers. Four percent of no-tillers continue to plant twin rows, which is double the percentage from 2 years ago.

Even as no-till drill purchases were healthy, the trend continues of more no-tillers using planters to seed soybeans. Half of soybean growers will use a planter in 2013, up from 48% in 2012. Drill usage remains flat at 34%, while 16% of no-tillers will use both a planter and drill.

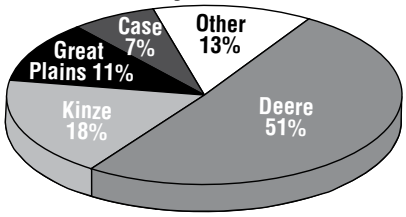
As for the brand of planter or drill used to seed soybeans, John Deere remains the leader at 51%, which is up 3 percentage points from

What Corn-Planter Brand No-Tillers Use



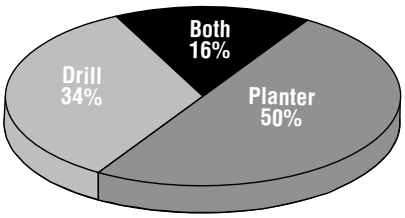
Half of no-tillers who responded to the survey use a John Deere planter for corn. Kinze is the next most popular brand for corn planters with 24%.

Brand of Planter or Drill No-Tillers Use to Seed Soybeans



More no-tillers use a John Deere planter or drill (51%) to seed soybeans than any other brand. Just 7% of respondents report they use a Case IH planter or drill.

What No-Tillers Use to Seed Soybeans



At 50%, the majority of no-tillers use a planter to plant soybeans vs. 24% who use a drill.

last year. Kinze has seen its share of the market drop from 22% to 18%, while Great Plains jumped to 11% compared to 7% last year.

While no-till farmers use a wide range of planter attachments, 77% use seed firmers, closing wheels and row cleaners.

Use of minimum-tillage tools saw a drop across almost all product groups. Most notable was the 4.3% drop in respondents who said they use a disc (16.3% vs. 20% in 2012). Vertical tillage tools are most often used by no-till farmers at 17.9%.

Precision Tools

When it comes to guidance systems, the use of GPS tractor auto-steer will see a considerable increase this year. Some 37% of farmers used the technology last year compared to 44% who will use it in 2013. For the first time in our survey, GPS lightbar usage will see a decline, from 44% in 2012 to 41% this year.

Variable-rate fertilizer applications remain on the upswing at 30% of no-tillers, compared to 26% in 2012, while growth in variable-rate seeding appears to have paused for the moment at 17%. Both field mapping and yield monitor data analysis will be used by 46% of no-tillers this year, compared to 41% and 44%, respectively, in 2012. AEI

Evaluation of 2012 Operating Expenses

	Average Farm Acres	Average Operating Expenses (Per Farm)	Average Operating Expenses (Per Acre)
Total	**1,215**	**$479,608**	**$394.74**
Eastern Corn Belt	1,084	$456,810	$421.41
Western Corn Belt	1,318	$519,950	$394.50
Great Lakes	749	$364,087	$486.10
Northeast	579	$379,825	$656.00
Northern Plains	3,170	$795,388	$250.91
Southern Plains	1,991	$507,567	$254.93
Appalachia	1,355	–	–

Note: *Data insufficient in Appalachia region to determine average operating expenses.*

Regionally in 2012, no-tillers in the Northern Plains states had the largest outlays in crop operating costs at $795,388. The lowest outlay was by no-tillers in the Great Lakes at $364,087.

Breakdown of 2012 Crop Operating Expenses by Region

(average total expenses per farm for each expense category)

	All	Eastern Corn Belt	Western Corn Belt	Great Lakes	Northern Plains	Southern Plains	Northeast
Fuel	**$23,176**	$18,702	$28,720	$16,257	$32,320	$26,448	$20,070
Land Rent	**$75,534**	$91,680	$112,946	$46,364	$129,399	$48,545	$37,274
Seed/Seed Treatments	**$60,521**	$63,619	$68,057	$43,753	$83,024	$67,345	$40,579
Pesticides	**$33,706**	$33,394	$33,348	$25,708	$43,349	$43,782	$21,121
Fertilizer	**$94,713**	$91,210	$104,220	$72,242	$194,857	$112,944	$47,778
Lime/Soil Conditioners	**$10,226**	$11,201	$9,060	$6,813	$19,500	$3,139	$7,109
Equipment	**$70,900**	$58,288	$76,909	$62,888	$135,970	$75,486	$62,541
Machinery Service	**$15,128**	$14,491	$18,088	$11,575	$15,159	$19,179	$9,302
Machinery Parts	**$18,536**	$17,243	$19,664	$13,897	$28,272	$24,482	$15,479
Precision Equipment	**$6,839**	$6,647	$5,255	$6,664	$7,515	$9,619	$5,470
Custom App./Hauling	**$12,860**	$8,056	$7,089	$8,807	$25,838	$22,935	$20,603
Labor	**$36,897**	$27,842	$31,551	$29,167	$61,037	$31,641	$66,438
Interest	**$20,572**	$14,437	$24,707	$19,952	$19,148	$21,662	$26,061
Totals	**$479,608**	**$456,810**	**$519,950**	**$364,087**	**$795,388**	**$507,567**	**$379,825**

Throughout the entire survey region, no-tillers, on average, invested $479,608 in crop operating expenses in 2012. The largest outlays came in fertilizer, land rent and equipment.

SECTION 2 — 2013 Survey Results

Weather Challenges No-Tillers' Profitability

While drought took a punch at farmers' bottom lines in 2012, three out of every four growers absorbed a hit to yields and a 4.5% increase in expenses, to realize a rise in net income.

By Darrell Bruggink, Executive Editor

Thank goodness for high grain prices — and crop insurance, too. A topsy-turvy 2012 saw both the highs and lows of choosing a career as a farmer.

The anticipation of a strong agricultural economy in 2012, as well as an unusually warm March, had no-tillers enthusiastic about the potential for another banner year as they headed to the fields. A widespread drought hitting most regions of the Corn Belt quickly stole all the momentum.

To top it all off, the cost of doing business on an acre of farmland increased again. However, the 4.5% increase in expenses in 2012 paled in comparison to 2011 when costs per acre of land rose a staggering 22%.

The Bottom Line

The light at the end of the tunnel was that more readers of *No-Till Farmer* reported a gain in net income than those who took a loss. For every three no-tillers that made a net profit in 2012, only one suffered a net loss.

Overall, respondents came in with a net profit that was more than 16% greater than in 2011.

The data reported in our 5th annual "No-Till Operational Benchmark Study" is the result of 603 readers of *No-Till Farmer* taking the time to fill out a 4-page, 69-question survey. A total of 2,500 surveys were distributed proportionately to where the paid-subscribing readers of *No-Till Farmer* are located.

This is a one-of-a-kind industry survey exclusive to *No-Till Farmer*.

The average size of a *No-Till Farmer* reader's farm was 1,215 acres, down from 1,253 acres last year. However, no-tillers told us they spent on average $479,608 on inputs for their farm, which was only $6,000 more than 2011 expenditures of $473,241. In 2010, farmers spent only $388,464 in inputs.

When you consider the reduction in acreage among this year's respondents, the average cost of inputs per acre came in at $394.74, or $17.05 ahead of last year's expenditures of $377.69 per acre. That's a 4.5% increase.

No-Till Practices Survey Regions

- **Eastern Corn Belt (ECB)** — Illinois, Indiana, Ohio
- **Western Corn Belt (WCB)** — Iowa, Nebraska, Missouri
- **Great Lakes (GL)** — Michigan, Wisconsin, Minnesota
- **Southern Plains (SP)** — Kansas, Colorado, Oklahoma, Texas
- **Northern Plains (NP)** — South Dakota, North Dakota, Montana
- **Northeast (NE)** — New York, Pennsylvania, Maryland, Delaware, New Jersey
- **Appalachia (AP)** — Kentucky, Tennessee, West Virginia, Virginia, North Carolina

Table 1. Evaluation of 2012 Operating Expenses

	Average Farm Acres (per respondent)	Average Operating Expenses (per farm)	Average Operating Expenses (per acre)
Total	**1,215**	**$479,608**	**$394.74**
Eastern Corn Belt	1,084	$456,810	$421.41
Western Corn Belt	1,318	$519,950	$394.50
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Appalachia	1,355	–	–

Note: *Data insufficient in Appalachia region to determine average operating expenses.*

Fertilizer, fuel, labor and land rent were some of the major culprits in dramatically rising costs in 2011. For the most part, expenses were easier to swallow in 2012.

Following is the percentage change in itemized per-farm costs from 2011 to 2012:

- Fuel: +1.7%
- Land rent: –2.6%
- Seed/seed treatments: –7.2%
- Crop protection: +16%
- Fertilizer: +9%
- Lime/soil conditioners: –6%
- Equipment: –0.5%
- Machinery service: –6.9% decrease
- Machinery parts: +1.9%
- Precision equipment: –22.8%
- Custom application/hauling: –5.7%
- Labor: –11.4%
- Interest: +4.1%

While more itemized expenses decreased than increased in 2012, seed and seed treatments, crop protection products and fertilizer once again led an overall rise in costs.

"We continue to see farmers spending more on the inputs necessary to raise a crop, but we did see a leveling off on some discretionary dollars," says Frank Lessiter, editor of *No-Till Farmer*. "After some great financial earnings at the start of the decade, we see expenditures on equipment leveling off. That said, the numbers remain solid — even after a drought year.

"Clearly, the impact of the drought was muted to some extent by strong crop prices last year and earnings from crop insurance. No-tillers remain in a solid position entering the 2013 cropping season."

On a regional basis (see map on p. 6 for breakout of states by region), Northeastern no-tillers continue to spend the most on inputs on a per-acre basis. While they had the second-lowest, farm-expenditure total behind the Great Lakes region at $379,825, the fact the average farm size in the Northeast is just 579 acres drove up their per-acre cost to $656.

Similarly, the Great Lakes region with its relatively low farm size of 749 acres finished with average operating expenses per acre of $486.10, second highest in the U.S. That was followed by the Eastern Corn Belt at $421.41 per acre, based on total expenditures of $456,810 across 1,084 acres on average.

Northern Plains' no-tillers may have spent nearly $800,000 on expenditures, but at 3,170 acres per farm, that took their per-acre costs down to $250.91.

The Southern Plains was close behind on the low-pay scale at $254.93 per acre. The Western Corn Belt averaged $394.50 per acre.

2013 Costs Appear Level

We also asked *No-Till Farmer* readers to estimate their farming

Table 2. National Breakdown of Crop Operating Expenses (2009-13)
(average total expenses per farm for each expense category)

	2009	2010	2011	2012	2013*
Fuel	$20,718	$16,872	$22,786	$23,176	$23,875
Land Rent	$58,821	$62,600	$77,533	$75,534	$84,606
Seed/Seed Treatments	$49,437	$47,210	$56,464	$60,521	$62,222
Pesticides	$33,572	$29,203	$29,065	$33,706	$34,668
Fertilizer	$67,964	$58,896	$86,914	$94,713	$94,854
Lime/Soil Conditioners	$10,020	$8,468	$10,878	$10,226	$11,516
Equipment	$52,688	$65,957	$71,252	$70,900	$59,337
Machinery Service	$16,088	$13,305	$16,256	$15,128	$14,090
Machinery Parts	$17,318	$17,485	$18,194	$18,536	$16,338
Precision Equipment	$7,503	$7,980	$8,864	$6,839	$6,974
Custom App./Hauling	$12,360	$11,647	$13,636	$12,860	$12,384
Labor	$26,035	$28,533	$41,633	$36,897	$37,777
Interest	$22,324	$20,308	$19,766	$20,572	$20,694
Totals	**$394,848**	**$388,464**	**$473,241**	**$479,608**	**$479,335**

**Estimated 2013 cost of production*

Table 3. Breakdown of 2012 Crop Operating Expenses by Region
(average total expenses per farm for each expense category)

	All	ECB	WCB	GL	NP	SP	NE
Fuel	**$23,176**	$18,702	$28,720	$16,257	$32,320	$26,448	$20,070
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Totals	**$479,608**	**$456,810**	**$519,950**	**$364,087**	**$795,388**	**$507,567**	**$379,825**

expenses for 2013. Overall, they expect bottom-line expenditures to be right on par with 2012 at $479,335 on average per farm vs. $479,608 last year.

Land rent seems to be the one item that they anticipate will take a substantial hike, from $75,534 per farm in 2012 to $84,606 in 2013. That's a 12% increase.

On the other hand, equipment appears to be the area that no-tillers are trimming, with actual equipment purchases expected to drop from $70,900 to $59,337 per farm, or a 16.3% decrease. Farmers are also planning to slightly reduce machinery service and parts in the year ahead.

Spending onthe other big-ticket items should be relatively flat. Fertilizer costs are expected to rise just 0.1%, while seed expenses will increase 2.8%.

(In Table 3, operating expenses are broken down by region to allow comparisons between farming operations in that region. A line-item breakout of Appalachia was not available because the sample size was not large enough to produce reliable data.) AEI

No-Till Acres See An Uptick

Minimum tillage sees a 6-point decline among *No-Till Farmer* readers.

The tillage practices of *No-Till Farmer* readers in 2012 looked quite similar to 2011, with one exception. Those who say they use minimum tillage declined considerably from 31% in 2011 to 25% in 2012.

"Conventional wisdom says you lose moisture when you open up the soil. Last year's drier conditions may have discouraged some farmers from using tillage," says Frank Lessiter, editor of *No-Till Farmer*. "In last year's survey, we saw more tillage conducted, so we can't really say a trend has started toward less tillage."

No-till is practiced to some extent by 95% of the 603 farmers who answered *No-Till Farmer*'s 5th annual "No-Till Practices Survey." This is unchanged from a year ago.

Meanwhile, strip-till is practiced by 18% (up 1%), vertical tillage by 18% (unchanged) and moldboard plowing by 3% (unchanged).

Overall, a reduction in tillage was evident across the major crops.

Corn Acres

The percentages of corn acres that were minimum-tilled fell to 13% last year from 19% in 2011. No-till only picked up 1% of those acres from 64% in 2011 to 65% last year, while strip-till was the big gainer at 22% after being at 17% in 2011.

No-tilled acres of small grains like wheat, barley and oats rose from 85% to 90% of the acreage among respondents, while soybeans saw a slight increase in no-tilled acres from 86% to 88%. Minimum-tilled, small-grains acres saw the largest decline, from 13% in 2011 to just 9% in 2012.

Here are some interesting things to note about the tillage habits of *No-Till Farmer* readers by region:

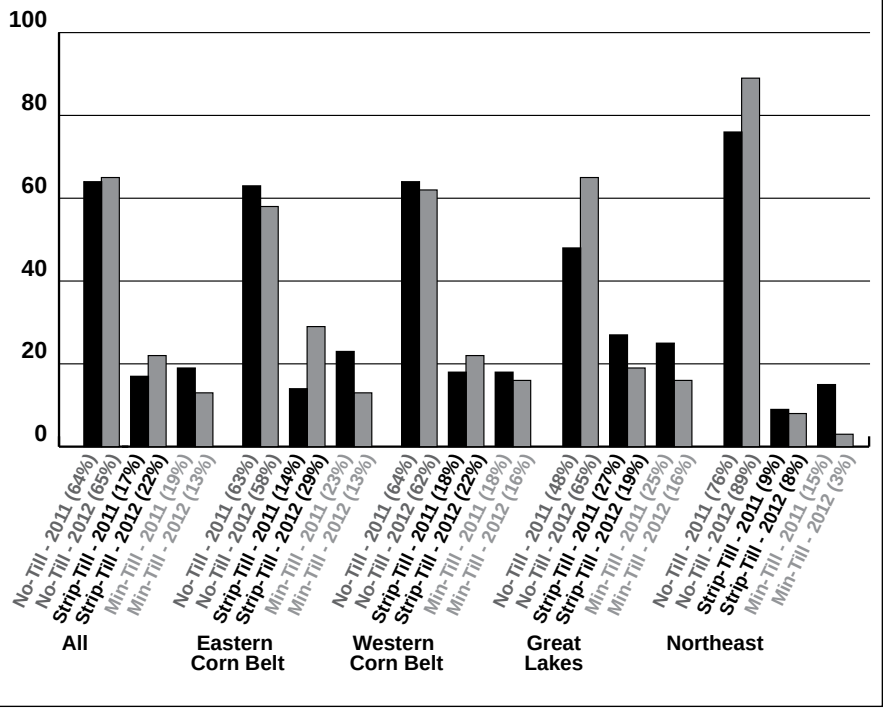
Eastern Corn Belt – No-till corn acres actually fell for the second straight year in the region, from 63% in 2011 to 58% in 2012. Strip-tilled corn was the big winner, experiencing a major leap from 14% to 29%, while minimum-tilled acres fell from 23% to 13%.

Western Corn Belt – Like the Eastern Corn Belt, the percentage of corn acres no-tilled in the Western Corn Belt slipped for the second

Table 4. Percentage of Acres for Different Tillage Practices

	Corn	Soybeans	Small Grains
No-Till	65%	90%	88%
Strip-Till	22%	3%	3%
Min-Till	13%	7%	9%

Figure 1. What Tillage Practices Do You Use as a Percentage of Your Corn Acres?



straight year from 64% to 62%. Strip-till again was the beneficiary, increasing from 18% to 22%. Minimum tillage suffered a 2% decline to 16% of all corn acreage.

Great Lakes. The one thing clear in the Great Lakes is that minimum tillage is declining, dropping from 25% of the corn acreage in 2011 to just 16% in 2012. However, there was a healthy upward swing on corn acres going back to no-till (from 48% to 65%) after 2 consecutive years of decline, while strip-till saw a considerable decline (27% to 19%) after 2 years of gains.

Northeast. No-till bounced back after a decline in 2011 to establish a strong position in the Northeastern region, with 89% of the corn acres in no-till (up 11%). Strip-till gets 8% of the corn acres, while minimum tillage nabs just 3%.

Plains States. In the South, no-till corn accounts for 71% of the acres, while strip-till takes 28%. No-till corn accounts for 74% of the acres in the North. Strip-till and minimum tillage split the balance at 13% each.

Appalachia. No-till and strip-till dominate the landscape at 77% and 22%, respectively, of corn acres.

Table 5. Gain in No-Till Acreage You Expect to See in Your Area by 2016

	None	1-10%	11-20%	21-40%	More than 40%
All	22%	39%	26%	8%	5%
ECB	22%	44%	18%	10%	5%
WCB	20%	46%	25%	6%	3%
GL	22%	40%	29%	8%	2%
NE	19%	29%	35%	6%	10%
NP	31%	28%	25%	6%	9%
SP	11%	36%	36%	9%	7%
App	50%	13%	13%	19%	6%

Table 6. Gain in Strip-Till Acreage You Expect to See in Your Area by 2016

	None	1-10%	11-20%	21-40%	More than 40%
All	43%	37%	15%	5%	–
ECB	33%	43%	18%	6%	1%
WCB	41%	35%	17%	6%	1%
GL	41%	43%	10%	6%	–
NE	72%	20%	8%	–	–
NP	45%	20%	35%	–	–
SP	31%	46%	18%	5%	–
App	82%	18%	–	–	–

Soybeans, Small Grains

The percentage of soybean acres no-tilled climbed back above 2010 levels (89%) when *No-Till Farmer* readers told us they no-tilled 90% of their acres in 2012. That was up from 86% in 2011. Minimum tillage fell from 10% to 7% of the acreage, while strip-tilled soybeans saw a slight decline to 3% after being at 4% in 2011.

Small grains also saw a return to more no-till at the expense of minimum tillage, rising from 85% in 2011 to 88% in 2012. Minimum-tilled small grains dropped from 13% to 9%.

"In the core Corn Belt, when it comes to corn, we see a continued shift toward more strip-till and a move away from minimum-tillage systems," Lessiter says.

"No-tilled soybeans and small grains may have received a bump from drier spring conditions last year. We'll have to see how 2013 planting conditions shape up and whether moisture conditions are the driving influence with tillage systems for those crops."

No-Till Growth

The growth of no-till has been difficult to measure during the past decade, but 78% of *No-Till Farmer* readers surveyed expect no-till acres to increase over the next 4 years. Some 65% anticipate no-till acres to grow by up to 20% in their area.

Southern Plains no-tillers appear to be the most optimistic group regarding no-till with 88% expecting growth and 72% expecting up to 20% growth in the next 4 years. The Western Corn Belt also is strong on no-till growth with 71% expecting no-till growth of up to 20% in their area in the next 4 years.

The Northeast has one of the highest growing adoption rates for no-till in the country, and 51% of no-tillers in that region expect acreage growth of more than 10% in the next 4 years alone.

The Southern Plains chimes in at 52% of growers expecting more than 10% growth in the next 4 years.

Strip-Till Growth

Despite solid gains in the Corn Belt during the past year, *No-Till Farmer* readers expect slower growth of strip-till overall. For example, 43% do not expect strip-till to grow in their area over the next 4 years compared to just 22% for no-till.

However, some significant gains are still anticipated over the next 4 years. Some 64% of Southern Plains' farmers believe strip-till will grow by up to 20% over the next 4 years, followed by the Eastern Corn Belt (61%). The Northern Plains follows at 55%,when it comes to growing strip-till, while the Great Lakes region comes in at 53% and the Western Corn Belt stands at 52%.

The Northeast and Appalachia see the least opportunity for strip-till, with 82% of Appalachian farmers and 72% of Northeastern farmers forecasting no growth in strip-tillage.

Strip-Till Holds Yield Lead

But no-tillers in Eastern Corn Belt beat yields of strip-tilling cousins.

Over the 5-year span of our annual "No-Till Operational Benchmark Study," strip-till has led the field each year when it comes to yield results. Of course, the big question as we awaited the final data compilation was how the 603 survey respondents said their systems' yields would fare in a year where moisture was definitely a limiting factor.

While the conventional wisdom was that no-till would look much better in a droughty summer, such as we had in 2012, strip-till still ended up again with the highest yields. While no-till did close the gap overall and saw a win in the Eastern Corn Belt, it still ended up trailing strip-till by a margin of 12 bushels per acre (146 to 134 bushels per acre).

Ultimately, tough growing conditions in the Southern Plains, where no-till is the major practice for corn, dragged down no-till's overall average yields. No-till corn yields only averaged 67 bushels per acre in that region.

Over the 5-year history of the "No-Till Benchmark Study," strip-till has averaged 166 bushels per acre compared to 157 for minimum-till and 150 for no-till. But while strip-till, minimum-till and no-till have finished 1-2-3, respectively, over the first 4 years of the study, no-till did edge out minimum-tilled corn, 134 to 133 bushels per acre, in 2012, providing evidence that no-till systems perform better than tillage systems in drier conditions.

At least in the Eastern Corn Belt, no-tillers reported that their average yield of 158 bushels per acre was better than those of strip-tillers in the region, who finished at 153 bushels. Minimum-tilled corn was a full 22 bushels per acre less than no-till.

Otherwise, strip-till led the yield game across the other six regions. It had its strongest showing in the Great Lakes with an average yield of 157 bushels per acre, boasting a 15-bushel advantage over minimum-till and a 20-bushel win over no-till.

It also had a strong showing in the Western Corn Belt with an average yield of 153 bushels per acre, besting minimum tillage by 17 bushels per acre and no-till by 19 bushels per acre.

Table 7. Average Per-Bushel Yields for Corn
(Based Upon Tillage System Used)

	All	WCB	ECB	GL	NE	SP	NP	AP
No-Till	134	134	158	137	136	67	102	91
Strip-Till	146	153	153	157	144	136	–	–
Min-Till	133	136	136	142	152	–	88	–

Table 8. Comparison of Corn Yields by Tillage System (2008-12)

	2008	2009	2010	2011	2012
No-Till	156	161	151	148	134
Strip-Till	166	175	171	173	146
Min-Till	163	166	160	162	133

Soybeans Hold Up

Despite the droughty conditions, soybean yields held up considerably well.

While the 5-year average yield for both no-tilled and minimum-tilled soybeans stands at 48 bushels per acre, 2012 yields came in at 47 bushels per acre for no-tilled beans and 48 bushels per acre for minimum-tilled beans.

Strip-tilled soybeans, a recent addition to our survey, netted an average of 50 bushels per acre.

Finally, no-tilled winter wheat came in at an average of 67 bushels per acre vs. 60 for minimum-tilled winter wheat. No-till edged minimum tillage when it came to spring wheat by a margin of 52 to 51 bushels per acre.

Top No-Till Corn Growers

One way *No-Till Farmer* editors like to break down this data is to look at the no-tillers who finished among the top 33% in corn yields. While soil type, moisture and regional growing conditions certainly play a factor in yields, it's interesting to note some of the characteristics of this group.

No-tillers who finished in this group averaged 173 bushels per acre, which was a decrease of 12 bushels per acre over the top-third of corn growers in 2011. However, with the average no-tiller yielding 134 bushels per acre in 2012, the top-third had a 29% yield advantage over the typical farmer.

This group also had success raising no-tilled soybeans with an average yield of 55.8 bushels per acre — which was actually 0.2 bushels per acre better than the 2011 top performers.

Here are some trend lines among these high-yielding no-till corn growers:

- The Western Corn Belt had 11 of the top 12 no-till corn yielders. This region had 35% of the top-third-yielding no-till corn growers. While Northeastern no-tillers didn't finish among the very best, they saw consistently high yields with 24% of their growers among the top-third.
- Smaller seemed to be better this year. While the average farm size in 2011 among the top one-third was 1,332 acres, it was just 960 in 2012. Their average farm expenditure was $409,277, or $426.33 per acre. On a per-acre basis, they spent $31.59 more than the average *No-Till Farmer* reader, or 8% more.
- While the 55-to-64 age group led the way with 27.7% of its members in the top-third, that was less than the overall average of 34.5% that returned the No-Till Practices Survey. It was the 35-to-44 age bracket that performed above average, with 20% in that group making up the top third of no-till

Table 9. Average Per-Bushel Yields for Soybeans
(based upon tillage system used)

	All	WCB	ECB	GL	NE	SP	NP	AP
No-Till	47	46	50	47	55	29	35	44
Strip-Till	50	–	–	–	–	–	–	–
Min-Till	48	47	47	44	–	–	38	–

Table 10. Comparison of Soybean Yields by Tillage System (2008-12)
(bushels per acre)

	2008	2009	2010	2011	2012
No-Till	45	50	49	49	47
Min-Till	46	47	49	49	48

corn growers when only 13.1% made up the entire field of respondents. Last year, the 65-and-older age group had the most members among the top third.

- This year's top-third rented 47% of its farmland vs. owning 42%, with another 11% being share-cropped. That was a narrower margin than 2011 when 49% of the land was rented and 38% was owned.
- As it did among all survey respondents, cover-crop use jumped dramatically from 49% of these no-tillers in 2011 to 58% in 2012.That was just 4% behind the number of total survey respondents who raised cover crops in 2012. Of the acres planted to cover crops, 34% was planted to cereal rye, 16% to annual ryegrass, 14% to small grains and 12% to radishes.
- Regarding precision technology, more of the top-third corn growers were relying on GPS lightbars (41.6%) than GPS tractor guidance (36.4%), which was opposite of the overall respondents.They were more likely to use variable-rate fertility (33.4%), but less likely to use variable-rate seeding (15%) than the average respondent (30.2% and 17.8%, respectively). The top no-till corn growers were more likely than the average no-tiller to use yield monitors, field mapping and satellite aerial imagery.
- When it comes to planter attachments, the top-third corn yields are more likely to use row cleaners (82% to 77%), closing wheels (87% to 82%), seed firmers (84% to 80%), pop-up applicator (47% to 42%) and an at-plant nitrogen applicator (38% to 27%) than the average *No-Till Farmer* reader.
- Their average seeding rate of 32,662 seeds per acre is a 5% increase over the average no-till rate of 31,103. However, both that seeding rate and the percentage increase is less than last year, when the top-third corn yielders planted 32,765 seeds per acre, a 6.5% increase, over the average of 30,736. While 85% use Roundup Ready corn hybrids, that's 4% less than the average no-tiller.
- The top-third of corn yielders use more conventional (23%) and LibertyLink hybrids (23%) than the national average (19% and 20%, respectively). They used the following brands: Pioneer 48% (46.6% nationally); DeKalb 36% (38.5%); Syngenta Seeds 17% (18.5%); Mycogen Seeds 13% (10.5%); 1 other seed brand 36% (34.8%); and 2 other seed brands 17% (22.1%).
- The high-yielding group is using less nitrogen, including 17% at less than 0.8 pounds per acre vs. their yield goal (15.3% nationally) and 49% using 0.8 to less than 1 pound per acre (45.7% overall). They are also above average with at-plant nitrogen applications at 72.4% vs. 65.6% nationally and use slightly more sidedress applications (62.8% vs. 60.9% nationally). They use fewer nitrogen applications in the fall (13.4% vs. 17.6% nationally), at spring pre-plant (13.4% to 17.6%) and as foliar sprays (13.4% to 15.4%). Some 40% use 32% nitrogen solutions vs. 31% nationally.
- With few exceptions, the top-third corn yielders were more likely to use micronutrients in their no-till program, including sulfur at 75% (69% nationally); zinc 65% (62%); magnesium 24% (21%); manganese 33% (29%); calcium 23% (21%); and boron 40% (35%).
- Gypsum is applied by 15% of the high-yielding corn growers vs. 17% nationally. Last year, 25% of the top-third corn growers applied gypsum vs. 18% nationally.
- In 2011, this group used less glyphosate than the average no-tiller. But it appears this year they will use about the same amount, although they will make an average of 2.09 applications vs. 2.2 per season for no-tillers nationally. While 9% of no-tillers nationally said they will use more glyphosate than last year, only 5% of the top-third plan to increase usage.
- In 2011, this group used other residual and contact herbicides more than the average no-tiller. While atrazine usage was the same at 71%, only 71% of the top-third corn yielders applied 2,4-D (79% nationally) and 73% used other residuals/contacts (76%).
- The top corn yielders were much bigger users of fungicides at 35% vs. the national average of 27%,

Table 11. Operating Expenses of Top One-Third Yielding Corn & Soybean Growers

	Average Farm Acres	Average Operating Expenses	Average Operating Expenses (Per Acre)
All Growers	1,215	$479,608	$394.74
Corn Growers	960	$409,277	$426.33
Soybeans Growers	1,040	$418,727	$402.62

and more also applied insecticide at 45% vs. just 35% nationally.

Top No-Till Soybean Growers

In a review of the top one-third of soybean growers, the average yield of 60.5 bushels per acre was up slightly from 60.3 bushels from the 2011 production season.

When it came to growing corn, their average yield of 154.2 bushels per acre was 19 bushels per acre less than the group of top-third corn yielders (173).

Here are some notable statistics from the top third of no-till soybean producers:

- The Northeast appeared more than capable at growing soybeans in 2012, with 20.1% of the top-third yielders coming from this region compared to 14% of the total survey respondents coming from the Northeast. They also captured nine of the top 17 yields overall.
- The Eastern Corn Belt had the largest number of representatives in this group at 38% vs. 27% of the overall survey respondents coming out of this region. The Western Corn Belt had 17% of the top-third soybean yielders, while there were none out of either the Southern or Northern Plains.
- The average farm size of the top-third soybean yielders stood at 1,040 acres, which was less than last year's average of 1,165 acres but more than this year's top corn growers' average farm size of 960 acres.
- Similar to the top corn growers, this group had overall expenditures that were greater than the average no-tiller, despite farming about 170 fewer acres on average. Overall expenditures came in at $418,727, or an average of $402.62 per acre. They spent $7.88 more per acre than the average no-tiller, or 2% more.
- The top-yielding soybean growers use cover crops on a higher percentage of their ground than their corn brethren at 65% to 58%, beating the national average of 62%. Cereal rye was the most popular cover crop at 47%, followed by radishes at 41%, annual ryegrass at 31% and small grains at 27%.
- Planters remain more popular than no-till drills when it comes to seeding soybeans. Half of the top-yielding soybean growers only use planters, while 34% only use drills. Another 16% say they use both a planter and drill.
- When it comes to seeding rates, the top-third of soybean yielders drill 168,283 seeds per acre, which is 2% higher than the average no-till soybean producer (164,894). Those who use planters seed soybeans at 150,279 per acre vs. 146,997 for the national average, or a 2.2% increase. Overall, drill users drop 12% more seed than no-tillers operating planters.
- The varieties the top soybean producers plant are close to the national averages — including Roundup Ready at 92.2% (93.2% nationally); conventional 7.2% (6.8%); and LibertyLink 6% (8.2%). They are bigger users of Pioneer brand varieties at 49% vs. the average no-tiller (42%) and slightly larger users of Asgrow varieties at 29% (28% nationally).
- Across the board, the top soybean yielders are less likely to apply fertilizer to their crop. Some 25% apply nitrogen compared to 30% nationally; phosphorus is 54% to 73%; potassium 59% to 80%; and micronutrients 48% to 55%.
- Some 84% apply an inoculant to their soybean seed compared to the national average of 82.5%.
- The top soybean growers are slightly more likely to apply gypsum at 19% than the average no-tiller (17%).

Average Farm Size Falls to 5-Year Low

More farmland was owned than rented in 2012, with Western Corn Belt and Southern Plains leading the shift away from rented acreage.

At 1,216 acres, the average farm size of no-tillers who took our 5th annual No-Till Practices Survey was the smallest in the 5 years *No-Till Farmer* has conducted this exclusive survey.

That was down from 1,253 acres in 2011 and 1,264 in 2010.

Over the course of 5 years, the average farm size is 1,244 acres. The highest was 1,269 in 2008, the first year of our No-Till Benchmark Study.

We saw a shift in 2012 back to more owned acreage among *No-Till Farmer* readers, after seeing more rented acres the previous year.

Some 43.1% of farmland was owned in 2012 vs. 41.5% in 2011. That is the highest percentage of owned acreage in the survey's history.

Rented acres made up 40.3% of no-till crop production in 2012 — down less than 1 point from the 2011 level of 40.9%. The highest percentage of rented land at 42.9% was seen in 2009.

Finally, share-cropped acres slipped for the fourth consecutive year to 16.7% of farmland. That was down from 17.6% in 2011.

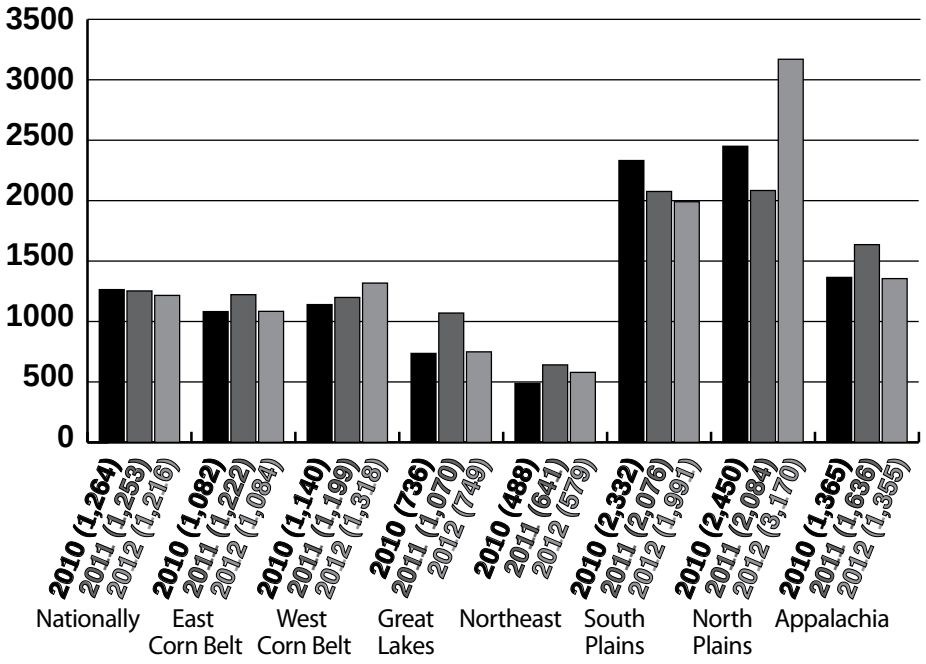
No-tillers in the Western Corn Belt led the way with owned acreage at 50% of farmland vs. just 32% rented.

The Southern Plains also had a disproportionately large number of owned acres to rented at 40% to 21%, and it easily leads the way in share-cropped acreage at 39%.

The Northeast has the highest percentage of rented land at 61%, which is 23 points higher than owned land (38%).

We saw some considerable shifts by region, including the Eastern Corn Belt moving from 50% rented land in

Figure 2. Average Acres Cropped by Region.



2011 down to 42% in 2012 and increasing share-cropped land from 13% to 19%.

The Northern Plains flip-flopped to more rented acreage in 2012 (50% rented to 44% owned) after owned led the way (48% to 43%) in 2011.

Less Corn, Soybeans in 2012

No-tillers show more crop diversification by adding small grains acres.

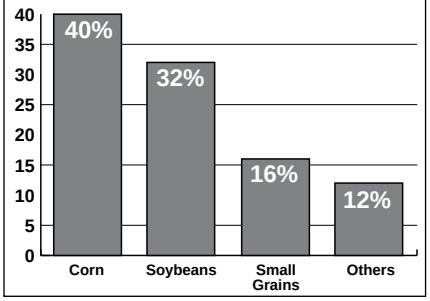
No-Till Farmer readers became a little more diversified in their cropping spectrum in 2012, shifting some acreage out of corn and soybeans and back to small grains. That follows a 2011 season where no-tillers planted more acres to the core Corn Belt crops of corn and soybeans.

Corn and soybeans remain the most commonly raised crops at 93% and 92%, respectively, of respondents to our 5th annual No-Till Operational Benchmark Study. Small grains are third at 54% and forages follow at 31%.

In 2011, corn accounted for 43% of the cropping acreage of no-tillers. However, the 603 no-tillers who returned our annual survey told us they planted 40% of their acreage to corn in 2012. Soybeans saw a similar decline, from 35% of total cropping acreage in 2011 to 32% in 2012.

Small grains, such as wheat, barley and oats, slipped to 12% of total cropping acreage in the 2011 season after being at 17% in 2010. Last year,

Figure 3. Crops Raised by No-Tillers as a Percentage of Total Acreage



Cover Crop Use Hits Record High, Surges to 62% of *No-Till Farmer* Readers

A dry summer didn't discourage no-tillers from using cover crops.

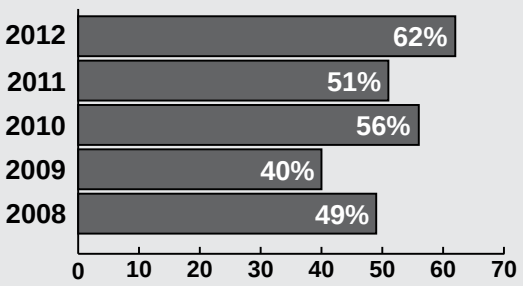
In fact, the early harvest that occurred and some timely moisture in the fall appears to have encouraged the use of covers, with 62% of participants in our 5th annual "No-Till Operational Benchmark Study" saying they planted cover crops in the fall of 2012 compared to 51% in 2011.

That double-digit increase led to an all-time high for cover-crop use in the history of the study. The all-time low was 40% in 2009, while 2008 saw 49% and 2011 hit 56%.

Cereal rye remains the most widely used cover crop among no-tillers, as it is raised on 26% of the cover-crop acres. That's followed by radishes at 19%.

Annual ryegrass saw a considerable increase to 17% of the cover-crop acreage compared to 13% in 2011, while small grains declined from 17% in 2011 to 12% in 2012.

Percentage of No-Tillers Who Planted Cover Crops



no-tillers headed back toward 2010 levels by seeding 16% of their acreage to small grains. *(See Figure 3.)*

Here are some notable cropping observations by region:

- The Eastern Corn Belt saw a shift from soybeans to corn and small grains. Soybeans comprised 43% of the cropping acreage compared to 46% in 2011. Corn took away one percentage point to rise from 48% to 49%. All other crops made up the remaining 8% — an increase from 6% in 2011 — with small grains taking 5% of the acres.
- The Western Corn Belt saw a considerable increase in diversification, with corn acres dropping to 49% compared to 54% in 2011, and soybeans slipping to 36% after being at 39% the prior year. Small grains comprised 7% of the 2012 acreage, increasing from 4%, while all other crops made up 8% of the crop after being at just 3% in 2011.
- Corn acres slipped in the Great Lakes from 48% of cropping acres in 2011 to 44% in 2012. Forage dropped considerably from 11% to 6%. Beans made up 36% of the acres, while small grains was 9%.
- Corn beat the trend in the Northeast, growing to 49% of the cropping acreage in 2012 compared to 44% in 2011. Forages remained at 12%. Soybeans made up 29% of the acreage, while small grains came in at 9%.
- Small grains remains the top crop in the Southern Plains, growing to 33% of the acreage compared to 31% in 2011. While both corn and soybeans each represented 20% of the acreage in 2011, corn edged ahead with 22% in 2012 vs. 19% for soybeans. Grain sorghum follows closely with 15% of the acreage.
- The Northern Plains shifted back to small grains and away from corn in a big way. Small grains fell from 31% in 2010 to 23% in 2011, but jumped to 39% in 2012. Meanwhile, corn dropped to 23% compared to 36% in 2011. Soybean acres also took a hit, dropping from 27% in 2011 to 19% last year.
- Soybeans remain the top crop in Appalachia at 38% of crop acreage, followed by corn at 29% and small grains at 22%. However, that represents a shift toward small grains from 2011, when soybeans were at 46% and corn was at 37%.

No-Tillers Hold the Line on Fertilizer Efficiency

Micronutrient use continues to climb higher, while no-till corn growers are expecting to make more at-plant nitrogen applications.

Average expenditures of nearly $100,000 annually for fertilizer are just one thing driving no-tillers to be more efficient with their fertility practices. More scrutiny on farming practices in key watersheds like the Chesapeake Bay, for example, is another factor driving fertilizer efficiency.

No-tillers are leading the charge in this area, as our 5th annual No-Till Operational Benchmark Study reveals.

The old standard of 1.2 pounds of applied nitrogen per anticipated bushel of corn appears to be going the way of the moldboard plow. Only 2% of the 603 no-tillers who returned our "No-Till Practices Survey" say they are applying nitrogen at that prior standard.

Most impressively, 61% of no-tillers today say they're applying less than 1 pound of nitrogen per bushel of expected yield, including 15% who are applying less than 0.8 pounds per bushel of corn.

The numbers are unchanged from last year, with 37% of no-tillers applying in the 1.0-to-1.2-pound, per-bushel range.

When it comes to timing of nitrogen applications, no-tillers are continuing to put more overall emphasis on at-plant applications. Some 66% of no-tillers expect to apply nitrogen at-plant for the 2013 corn crop vs. 63% in 2012. That appears to have come at the expense of sidedress applications, which are expected to drop from 64% of growers in 2012 to 61% this year.

There was only a 1-percentage-point change among fall (18%), spring pre-plant (39%) and foliar (15%) nitrogen applications.

For the third straight year, fewer no-tillers are expecting to apply at-plant phosphorus. While at 54% in 2012, phosphorus applications with the planter will be executed by only 49% of no-tillers in 2013. Both fall and spring pre-plant phosphorus applications are holding steady at 41% and 39%, respectively.

Meanwhile, sidedress and foliar phosphorus applications remain in the minority at 3% and 4%, respectively.

Fall applications of potassium increased from 43% in the fall of 2011 to 45% last fall — making it the lead-

Figure 4. How Much Nitrogen Do You Plan to Apply vs. Your Targeted Corn Yield?

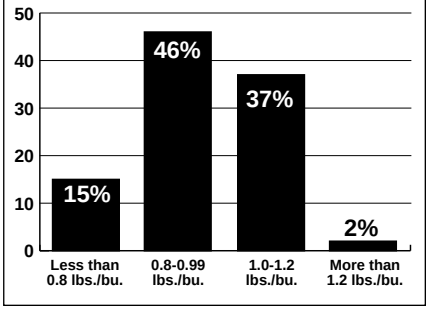
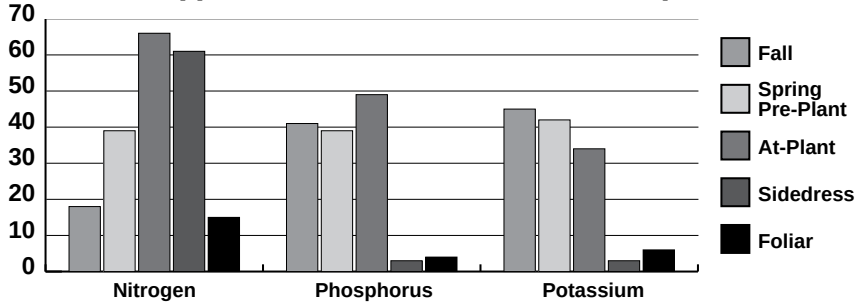


Figure 5. When Will You Make Fertilizer Applications for the 2013 Corn Crop?



ing application timing for potassium among no-tillers. After jumping from 40% in 2011 to 48% in 2012, spring pre-plant applications of potassium are dropping back to 42% this spring.

At-plant applications are also going to decrease from 37% last spring to 34% this year. Foliar potassium applications will be made by 6% of no-tillers, while sidedress timing will be used by 3%.

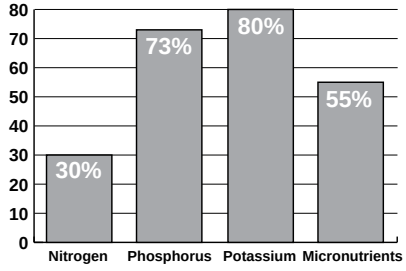
Feeding Soybeans

Potassium will be applied by 80% of no-tillers to this year's soybean crop, returning to 2011 levels after slipping to 77% in 2011. Phosphorus use will tick upward slightly from 72% last year to 73% this year.

Nitrogen will be applied to soybeans by 30% of no-tillers compared to 33% last year — perhaps dropping as a result of no-tillers finding nitrates in the soil profile unused by corn after the 2012 summer drought.

The trend toward higher micronutrient use continues for the third straight year. Some 55% of no-tillers will apply micros for the 2013 crop, up from 52% last year and 50% in 2011.

Figure 6. What Fertilizers Will You Apply For The 2013 Soybean Crop?



The timing of fertilizer applications for soybeans is relatively well spread out, led by spring pre-plant by 45% of no-tillers. Fall applications are second at 38%, followed by at-plant at 27% and foliar sprays at 26%.

Moreover, no-tillers continue to be regular users of inoculants for soybeans, with 83% planning to apply them for the 2013 crop vs. 82% in 2012.

Micros Trending Up

For the fourth consecutive year, micronutrients continue to be applied by more *No-Till Farmer* readers. *(See Figure 7.)* Here are trends for a few micronutrients over the past 4 years:

- Sulfur will be used by 69% of growers, having risen from 52%, 60% and 66% in previous years.
- Zinc usage will creep up from 60% last year to 62% this spring, after starting at 48% in 2010 and rising to 53% in 2011.
- Boron is edging up to 35% usage in 2013 after being at 33% last year. It started at 25% in 2010 and rose to 29% in 2011.
- Calcium will be applied by 21% of no-tillers this year. Its use has grown from 14% in 2010 to 18% in 2011 and 20% last year.
- Other notables include manganese use increasing to 29% compared to 26% in 2012; magnesium jumping from 17% to 21%; and copper rising from 12% to 14%.

The soil amendment gypsum has seen rapid uptake in recent years, starting at just 5% use in 2009 and topping off at 18% in 2012. This year, 17% of no-tillers are expecting to apply gypsum, meaning it will see a 1% decrease.

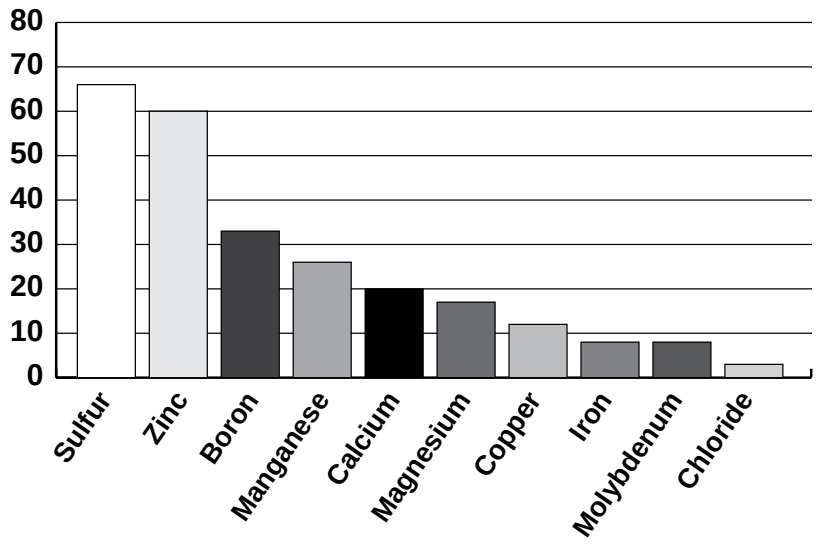
Manure Use

The number of *No-Till Farmer* readers using manure took a dramatic jump ahead of the 2012 season with 47% of farmers making applications compared to just 33% the prior year. For the 2013 cropping season, 43% of no-tillers plan to utilize manure in their operations.

Cattle manure remains the most widely used source of manure at 71% compared to 67% the prior year.

Both poultry and hog manure saw a 1% dip in usage over the prior year at 27% and 24%, respectively.

Figure 7. What Micronutrients Will You Apply in 2013?



SECTION 3

U.S. No-Till Farming — 2008 to 2013

Starting in 2009, *No-Till Farmer* (*NTF),* the monthly newsletter from Lessiter Publications, has conducted a survey of its readers to establish operational benchmarks and provide them with additional data on no-till farming.

In Section 2, the data gathered in 2012 is highlights developing trends in no-till farming in the U.S.

An average of 22% of the 2,500 farmers who *NTF* surveyed responded in each of the 5 years the study was conducted, and 26 states were covered. In addition to pure no-till practices, this group of farmers may also employ strip-till and minimum-tillage farming practices on part or all of their acreage.

Operational Expenses

One of the major findings of *NTF's* survey involved operational expenses. No-till growers throughout seven agricultural regions in the U.S. anticipate that their operating expenses for the 2013 growing season will decrease less than 1% compared with the 2012 growing season.

These growers say their biggest rise in prices for 2013 will come in lime/soil conditioners and land rent. Operating expenses they expect to decline by the largest percentage include farm machinery, machinery parts and machinery service.

On average, no-tillers are expecting to invest $479,335 in operational costs during this cropping season. If this forecast holds true, their overall costs will decrease by less than 0.5% for the year vs. the 2012 cropping season. But it will be up by 1.3% compared to the average expenditure of $473,241 that no-tillers reported in 2011. Compared to the average of the last three years, costs in 2013 are forecast to be up by 6.5%.

Lower Costs

Despite the dramatic rise in grain prices producers have seen in the past 2 years, no-tillers responding to the most recent survey are expecting a slight decreases for 2013 in many of the inputs and other usual costs all farmers incur.

Following a large drop in 2012 (-21%), no-till farmers are projecting that equipment costs will drop again this year (–16%), coming in at $59,337. These growers also say their overall costs for machinery parts, $16,338, will also decrease (–16.8%) compared to 2012. No-till farmers also expect spending cuts for machinery service (–6.9% vs. 2012).

It's not clear if no-tillers' reduced machinery investments the last two years as a result of cutting back in anticipation of higher input costs or because many farmers have already invested in upgrading their equipment in the past few years.

The largest increases are expected to come in lime/soil conditioners (12.6%) and land rent (12%).

Regional Differences

Regionally in 2012, no-tillers in the Northern Plains states (Montana, North Dakota and South Dakota) had the largest outlays in crop operating costs at $795,388. The lowest outlay was by no-tillers in the Great Lakes at $364,087. This stands to reason, as the average acreage for no-tillers in the Northern Plains states was 2,084, while Northeast growers averaged just 641 acres. However, the Great Lakes wasn't the lowest in acreage, the Northeast was at 579 acres.

Throughout the entire survey region, no-tillers spent on average $479,608 in crop operating expenses in 2012. The average acreage of all no-tillers who responded to the survey in the 2012 survey was 1,215.

Rising Acreage

No-till has been growing in practice, and in 2009 — the latest data available — approximately 35.5% of U.S. cropland had no-tillage operations, according to the USDA.

The agency now estimates the practice is growing by 1.5% a year, according to John Horowitz, an economist with the USDA;s Resource and Rural Economics Division.

Using the estimate of 88 million acres of no-till and an annual 1.5% increase, the U.S. should reach 111.7 million acres of no-till by the year 2025.

AEI

Background Data

What is your age?

	2013	2012	2011	2010	2009	5-Year Avg.
65 and over	27.6%	26.3%	25.1%	24.9%	22.8%	25.3%
55-64	34.5%	33.2%	30.7%	35.4%	30.4%	32.8%
45-54	16.9%	21.6%	26.3%	24.0%	25.6%	22.9%
35-44	13.1%	12.0%	11.6%	10.5%	14.7%	12.4%
25-34	7.5%	6.9%	6.0%	4.7%	6.5%	6.3%
Under 25	0.5%	0.4%	N/A	N/A	N/A	N/A

More than half (62.1%) of no-till farmers in U.S. are 55 years old or older.

How many years have you no-tilled?					
	2013	2012	2011	2010	4-Year Avg.
Never	0.7%	1.3%	1.2%	1.0%	1.1%
Less than 5	7.7%	10.2%	9.3%	8.3%	8.9%
5-15	38.4%	41.6%	39.2%	40.2%	39.9%
16-25	31.2%	28.4%	30.5%	32.0%	30.5%
More than 25	22.0%	18.6%	19.8%	18.5%	19.7%

On average, more than than half (53.2%) of no-till farmers have been working with no-till practices for 16 or more years.

Cropping Data

Please enter your total cropping acres:	
2013	1,215 acres/farm
2012	1,253 acres/farm
2011	1,264 acres/farm
2010	1,219 acres/farm
2009	1,269 acres/farm

What acreage group do you fall into?						
	2013	2012	2011	2010	2009	5-Year Avg.
Under 250	15.6%	14.7%	16.0%	14.8%	16.4%	15.5%
250-499	17.4%	16.9%	19.5%	23.3%	18.7%	19.2%
500-999	23.3%	25.0%	25.1%	21.1%	23.7%	23.6%
1,000-1,749	21.5%	22.6%	21.0%	21.1%	19.2%	21.1%
1,750-2,499	9.7%	7.7%	6.1%	8.3%	9.5%	8.3%
2,500-4,999	9.2%	9.4%	9.3%	8.3%	10.1%	9.3%
5,000 or more	3.2%	3.7%	3.0%	3.1%	2.4%	3.1%

No-tillers, on average, are working 1,215 acres in 2013 (top table). Just over 87% of those participating in the *No-Till Farmer* survey farm 1,750 acres or less.

What crops do you raise/plan to raise?						
	2013	2012	2011	2010	2009	5-Year Avg.
Corn	93.0%	96.1%	96.0%	90.9%	89.8%	93.2%
Soybeans	91.6%	91.6%	91.4%	83.2%	89.8%	90.0%
Small Grains	53.6%	51.9%	57.6%	57.9%	51.0%	54.4%
Forage	30.7%	28.6%	31.6%	33.3%	29.5%	30.7%
Sunflowers	4.7%	3.5%	5.0%	6.0%	3.8%	4.6%
Grain sorghum	8.5%	7.0%	8.2%	10.9%	10.6%	9.0%
Other	12.4%	16.1%	18.6%	19.1%	15.9%	16.4%

During the 5 years covered by the *NTF* surveys, an average of 93.2% of farmers reported planting corn on their no-till acres, while 90% planted soybeans.

How many acres do you grow or plan to grow of the following crops? *(acres/farm)*					
	2013	2012	2011	2010	2009
Corn	521	560	506	523	475
Soybeans	432	474	426	463	373
Small grains	352	279	364	269	243

Among survey respondents, corn was raised most often on no-till acres.

Land Use Data

What percentage of cropland do you:						
	2013	**2012**	**2011**	**2010**	**2009**	**5-Year Avg.**
Own	43.1%	41.5%	42.3%	38.5%	42.7%	41.6%
Cash Rent	40.3%	40.9%	39.7%	42.9%	39.8%	40.7%
Share Crop	16.7%	17.6%	18.0%	18.6%	17.5%	17.7%

The number of no-tillers who own their cropland (43.1%) and cash rent (40.3%) it is split nearly even.

Please indicate the tillage practices you use:						
	2013	**2012**	**2011**	**2010**	**2009**	**5-Year Avg.**
No-till	95.1%	95.0%	95.4%	97.3%	93.4%	95.2%
Strip-till	18.0%	17.0%	13.7%	17.4%	13.2%	15.9%
Vertical-tillage*	17.8%	19.0%	14.5%	N/A	N/A	17.1%
Moldboard plow	2.5%	3.0%	2.6%	4.7%	3.8%	3.3%
Minimum-tillage	25.3%	31.0%	35.7%	37.8%	30.4%	32.0%
** category added in 2011 survey*						

When it comes to tillage practices, of all the farmers surveyed between 2009-13, more than 95% utilize no-till. Next on their list is minimum-till, which is utilized by 32% of the farmers.

What percentage of your acreage is: *(Percentage of acreage of growers who use the practice on their farm)*					
	2013	**2012**	**2011**	**2010**	**2009**
No-tilled	78.0%	78.2%	82.4%	78.7%	80.6%
Strip-tilled	43.0%	43.1%	42.6%	43.8%	43.2%
Vertical tillage*	35.0%	35.0%	37.8%	N/A	N/A
Moldboard plow	20.0%	19.7%	23.6%	23.2%	23.4%
Minimum tillage	35.0%	35.3%	33.4%	38.5%	36.0%
** category added in 2011 survey*					

In 2013, the farmers surveyed indicated that a large majority of their acres (78%) was no-tilled, while 43% of their acres were strip-tilled.

What percentage gain in tillage acreage do you expect to see in your area 3 years from now?						
	2013	**2012**	**2011**	**2010**	**2009**	**5-Year Avg.**
No-Till						
None	21.8%	19.4%	17.7%	17.2%	14.6%	18.1%
1-10%	38.8%	37.9%	37.8%	39.3%	31.3%	37.0%
11-20%	26.0%	25.8%	24.7%	25.8%	25.9%	25.6%
21-40%	8.1%	9.7%	8.6%	11.2%	14.3%	10.4%
More than 40%	5.4%	7.1%	11.2%	6.5%	13.9%	8.8%
Strip-Till						
None	42.7%	40.2%	45.7%	37.5%	41.6%	41.5%
1-10%	36.7%	36.9%	34.9%	38.6%	32.0%	35.8%
11-20%	15.3%	16.8%	12.0%	15.6%	19.0%	15.7%
21-40%	4.9%	4.6%	6.0%	5.4%	5.1%	5.2%
More than 40%	0.4%	1.5%	1.4%	2.9%	2.3%	1.7%

Most no-till farmers surveyed (64.8%) expect no-till acreage to increase by 1-20% in the next 3 years. Over half (57.3%) see strip-till acreage growing during the same period.

How many acres of the following crops do you no-till?		
	No-till	**Strip-till**
Corn	409.0 acres	575.6 acres
Soybeans	412.9 acres	211.0 acres
Small grains	412.5 acres	N/A
Forage	148.5 acres	N/A
Grain sorghum	398.6 acres	153.8 acres
Sunflowers	340.0 acres	366.0 acres

Grain sorghum, small grains, corn and soybeans were the crops most often planted in no-till acres in 2013. Corn and sunflowers dominated strip-till acreage.

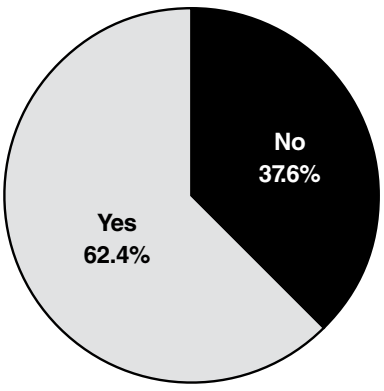
Did you plant cover crops last year?					
	2013	**2012**	**2011**	**2010**	**4-Year Avg.**
Yes	62.4%	51%	56%	40.1%	52.4%
No	37.6%	49%	44%	59.9%	47.6%

What cover crops did you raise?						
	2013	**2012**	**2011**	**2010**	**2009**	**5-Year Avg.**
Cereal Rye	46.5%	41.5%	29.0%	27.0%	41.0%	37.0%
Small Grains*	23.9%	24.9%	18.0%	12.0%	6.0%	17.0%
Annual Ryegrass	26.3%	22.6%	17.0%	18.0%	19.0%	20.6%
Radishes	40.2%	40.4%	10.0%	14.0%	4.0%	21.7%
Others**	10.6%	10.2%	11.0%	13.0%	11.0%	11.2%
Peas	12.2%	12.8%	7.0%	6.0%	2.0%	8.0%
Clover	17.8%	16.6%	4.0%	7.0%	3.0%	9.7%

**includes wheat, oats, etc.*
***includes Hairy Vetch, Millet, Buckwheat*

Overall, the majority (62.4%) of no-till farmers planted cover crops in 2012 (middle table). Almost half (46.5%) of the respondents report using cereal rye as their main cover crop (bottom table).

No-Tillers Planting Cover Crops in 2012



More than half of no-till farmers planted cover crops in 2012, with cereal rye being the most popular.

Projected No-Till Acreage Increase		
Year	**Acres**	**Increase 1.5%**
2009	88,000,000	
2010	89,320,000	1,320,000
2011	90,659,800	1,339,800
2012	92,019,697	1,359,897
2013	93,399,992	1,380,295
2014	94,800,992	1,401,000
2015	96,223,007	1,422,015
2016	97,666,352	1,443,345
2017	99,131,348	1,464,995
2018	100,618,318	1,486,970
2019	102,127,593	1,509,275
2020	103,659,506	1,531,914
2021	105,214,399	1,554,893
2022	106,792,615	1,578,216
2023	108,394,504	1,601,889
2024	110,020,422	1,625,918
2025	111,670,728	1,650,306

The USDA recently reported land with no-till operations are expected to grow by 1.5% a year. Based on 2009, the latest data available, 32% of U.S. cropland will use no-till practices in 2025.

Yield Data

What were your average per-bushel yields (bushels/acre) on no-tilled land, strip-till land and minimum-tilled land?							
	2012	**2011**	**2010**	**2009**	**2008**	**5-Year Avg.**	**USDA Est 2012-13**
Corn							
No-Till	134	149	151	161	156	150	123.4
Strip-Till	146	173	171	175	166	166	
Min-Till	133	162	160	166	163	157	
Soybeans							
No-Till	47	49	49	50	45	48	39.4
Strip-Till	50	49	56	51	47	51	
Min-Till	48	49	49	47	46	48	
Double-Crop Beans							
No-Till	30	34	30	30	34	32	NA
Min-Till	38	35	30	37	28	34	
Spring Wheat							
No-Till	52	55	57	55	48	53	45.0
Min-Till	51	51	70	48	57	55	
Winter Wheat							
No-Till	67	62	61	67	62	64	47.2
Min-Till	60	60	55	62	58	59	
Oats							
No-Till	86	70	77	74	73	76	61.3
Min-Till	93	83	70	64	33	69	
Grain sorghum No-Till	61	97	85	95	73	82	49.8
Sunflowers (lb./acre) No-Till	1,173	1,082	1,471	1,318	1,729	1,355	NA

This table provides a comparison for crop yields for selected crops for 2008-12, and provides a 5-year average for each crop. The last column is the USDA's projected yield for each crop as of April 11, 2013, for the 2012-13 marketing year.

Equipment Data

What equipment do you own and use in your operation? *(% of respondents)*						
	2013	**2012**	**2011**	**2010**	**2009**	**5-Year Avg.**
Drill	72.6%	65.0%	71.8%	69.4%	72.5%	70.3%
Planter	93.5%	93.0%	96.2%	92.1%	88.5%	92.7%
Strip-Till Rig	15.7%	14.0%	12.2%	15.9%	N/A	14.5%
Fertilizer Applicator	39.1%	40.0%	39.2%	N/A	N/A	39.4%
Self-Propelled Sprayer	45.7%	42.0%	37.0%	27.4%	27.7%	36.0%
Pull-Type Sprayer	35.5%	42.0%	43.6%	38.9%	38.8%	39.8%
Combine	81.9%	81.0%	82.6%	70.7%	67.2%	76.7%
Grain Cart	52.8%	54.0%	N/A	N/A	N/A	53.4%

The equipment most often owned and used by no-till farmers in the survey included planters (93.5%), combines (81.9%) and drills (72.6%).

What planter attachments do you use?						
	2013	2012	2011	2010	2009	5-Year Avg.
Closing Wheel	82.2%	84.5%	77.6%	66.0%	65.2%	75.1%
Seed Firmer	79.7%	77.7%	77.4%	64.5%	67.8%	73.4%
Row Cleaner	77.3%	75.9%	73.5%	67.1%	64.7%	71.7%
Coulter	49.7%	53.6%	53.0%	48.6%	49.0%	50.8%
2x2 Applicator	41.1%	37.2%	36.3%	25.7%	29.7%	34.0%
Down-Pressure System	40.6%	38.2%	36.1%	46.1%	39.3%	40.1%
Pop-Up Applicator	42.1%	40.9%	35.3%	25.1%	30.1%	34.7%
Nitrogen Applicator	27.3%	23.5%	24.6%	22.9%	25.0%	24.7%
Metering System	31.6%	29.9%	23.0%	45.2%	38.8%	33.7%

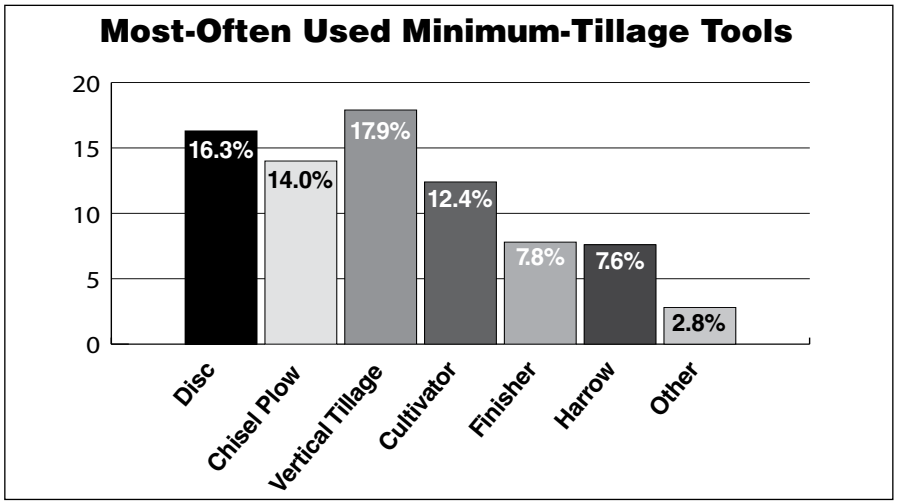
No-till farmers utilize a wide range of planter attachments. Over 77% of those surveyed used seed firmers, closing wheels and row cleaners.

What type of minimum-tillage tools are you using?						
	2013	2012	2011	2010	2009	5-Year Avg.
Disc	16.3%	20.0%	17.5%	21.2%	15.7%	18.1%
Chisel Plow	14.0%	16.0%	15.7%	20.8%	10.7%	15.4%
Vertical Tillage	17.9%	18.0%	14.7%	13.6%	8.0%	14.4%
Cultivator	12.4%	15.0%	12.2%	18.3%	13.8%	14.3%
Finisher	7.8%	10.0%	8.4%	10.0%	7.3%	8.7%
Harrow	7.6%	5.0%	6.0%	N/A	N/A	6.2%
Other	2.8%	2.0%	3.8%	3.8%	6.0%	3.7%

Those farmers who practice minimum-tillage, most often use vertical tillage (17.9%) discs (16.3%) and chisel plows (14.0%).

What equipment have you purchased or plan to purchase for the upcoming cropping season?					
	2013	2012	2011	2010	2009
Tractor	20.4%	19.0%	16.1%	13.6%	12.4%
Planter	15.1%	17.0%	13.7%	13.6%	12.0%
Combine	12.0%	11.0%	10.4%	10.8%	10.2%
Self-Propelled Sprayer	9.5%	8.0%	6.6%	7.0%	5.3%
Drill	10.0%	8.0%	6.4%	5.3%	6.9%
Tillage Tools	4.0%	6.0%	4.0%	N/A	N/A
Pull-Type Sprayer	2.8%	4.0%	3.8%	6.6%	4.0%
Forage Harvester	1.8%	N/A	1.4%	0.2%	0.1%

Between 12-20% of the no-tillers surveyed plan to purchase a tractor, planter and/or a combine in 2013.



No-till farmers who utilize minimum-tillage tools most often employ vertical tillage tools, discs and chisel plows, usually to control crop residue build-up.

Which of the following technologies will you use in your cropping operation?					
	2013	2012	2011	2010	2009
GPS Guidance — Lightbar	41.5%	44.0%	42.0%	39.3%	34.2%
Yield Monitor Data Analysis	46.3%	44.0%	37.1%	36.5%	31.7%
Field Mapping	46.0%	41.0%	35.6%	34.8%	32.6%
GPS — Tractor Auto-Steer	44.4%	37.0%	34.1%	30.8%	29.9%
Variable-Rate Fertilizing	30.2%	34.0%	26.9%	24.8%	20.2%
Variable-Rate Seeding	17.8%	22.0%	13.7%	8.5%	9.3%
Satellite Aerial Imagery	11.3%	10.0%	8.4%	6.8%	4.0%
Soil Electrical Conductivity Mapping	3.0%	4.0%	2.8%	3.0%	1.6%
Variable-Rate Pesticide Application	N/A	3.0%	2.8%	2.8%	2.2%
Electronic Fertilizer Application	N/A	4.0%	2.8%	2.1%	2.2%
GPS — Implement Auto-Steer	6.0%	5.0%	2.6%	3.8%	2.2%
Remote Sensing	3.0%	3.0%	1.0%	0.6%	1.1%
Electronic Weed Control	N/A	N/A	0.4%	0.2%	0.5%

Yield monitor data analysis (46.3%) and field mapping (46%) are the most popular technologies no-tillers use in their operations.

What tasks do you outsource?						
	2013	2012	2011	2010	2009	5-Year Avg.
Fertilizing	34.9%	32.0%	33.5%	34.4%	29.7%	32.9%
Spraying	28.4%	25.0%	29.2%	30.1%	27.0%	27.9%
Harvesting	15.8%	12.0%	13.3%	11.5%	14.8%	13.5%
Planting	3.7%	4.0%	4.4%	4.9%	5.3%	4.5%

After reducing outsourcing in fertilizing, spraying, harvesting and planting in 2012, all categories except planting saw an increase for 2013.

Seeding Data

What brand of corn planter do you use?					
	2013	2012	2011	2010	4-Year Avg.
John Deere	50.1%	51.3%	54.7%	54.6%	52.7%
Kinze	24.2%	26.6%	21.6%	18.7%	22.8%
Case IH	9.0%	10.3%	11.2%	10.4%	10.2%
AGCO/White	12.0%	9.9%	9.6%	11.9%	10.9%
Others	2.1%	5.9%	2.9%	2.6%	3.4%

John Deere easily surpassed all other popular brands of planters used by no-tillers for the last four years.

What number of rows do you have on your planter?						
	2013	2012	2011	2010	2009	5-Year Avg.
6 Rows	27.8%	30.8%	30.7%	25.4%	27.8%	28.5%
8 Rows	12.8%	13.1%	9.8%	12.3%	13.5%	12.3%
12 Rows	30.8%	33.8%	30.1%	29.7%	24.6%	29.8%
16 Rows	23.8%	20.9%	16.0%	16.6%	15.4%	18.5%
24 Rows	7.9%	6.4%	6.1%	3.4%	5.0%	5.8%
Other	10.5%	7.5%	9.2%	12.5%	13.7%	10.7%

Over the last five years, on average six and 12 rows were the most common among those surveyed.

What row width (inches) will you use?

	2013	2012	2011	2010	2009	5-Year Avg.
15 inches	7.9%	6.4%	4.3%	4.8%	4.9%	5.7%
20 inches	2.5%	2.9%	2.9%	1.7%	3.2%	2.6%
22 inches	0.7%	1.2%	0.4%	0.6%	N/A	0.7%
30 inches	91.0%	89.1%	87.8%	82.5%	79.5%	85.9%
36 inches	3.8%	5.4%	4.1%	5.2%	7.0%	5.1%
Other	3.6%	2.3%	2.9%	5.2%	5.3%	3.9%

Nearly all (91%) no-till farmers planted 30-inch crop rows, which easily surpassed all other row widths utilized by this group.

Do you plant twin rows?

Yes	3.7%
No	96.3%

According to *No-Till Farmer's* 2013 survey, twin-row planting is utilized by just 3.7% of no-till farmers.

What is your corn planting population?

2012	31,103
2011	30,736
2010	30,535
2009	30,129
2008	29,315

Corn seed populations have gradually risen during the past 5 years.

What corn hybrids and seed brands will you plant in 2013?

Corn Hybrids		Seed Corn	
Roundup Ready	88.8%	Pioneer	46.7%
Conventional	19.1%	DeKalb	38.5%
LibertyLink	20.4%	Syngenta Seeds	18.5%
CRW Trait	54.9%	Mycogen Seeds	10.5%
ECB Trait	55.8%	1 other seed brand	34.8%
Other	3.8%	2 or more other seed brands	22.1%

U.S. no-till farmers plan to use Roundup Ready (88.8%) corn hybrids and Pioneer (46.7%) seed corn the most in 2013.

What equipment do you use to seed soybeans:

	2013	2012	2011	2010	2009	5-Year Avg.
Planter	50.2%	47.9%	46.2%	49.3%	49.5%	48.6%
Drill	33.9%	33.4%	34.1%	50.7%	50.5%	40.5%
Both	15.9%	18.7%	19.7%	N/A	N/A	18.1%

During the past 5 years, no-tillers have almost evenly split their soybean seeding equipment between planters and drills.

What brand planter or drill do you use for soybeans?

	2013	2012	2011	2010	4-Year Avg.
John Deere	51.2%	55.3%	47.0%	51.6%	51.3%
Kinze	18.2%	22.0%	17.2%	13.2%	17.7%
Great Plains	10.6%	7.8%	12.3%	10.3%	10.3%
Case IH	7.2%	9.9%	7.5%	9.9%	8.6%
Sunflower	1.1%	3.3%	2.6%	2.5%	2.4%
Other	10.5%	14.1%	13.4%	12.6%	12.7%

John Deere planters and/or drills are the most-often used brand for planting soybeans.

What is the width (feet) of the drill that you use?

	2013	2012	2011	2010	2009	5-Year Avg.
10 feet	8.2%	13.5%	15.4%	8.5%	9.2%	11.0%
15 feet	47.2%	66.8%	44.2%	44.3%	50.7%	50.6%
20 feet	15.7%	19.7%	6.0%	14.1%	14.1%	14.0%
Other	34.3%	N/A	34.5%	33.1%	26.1%	32.0%

Overall, no-tillers most often utilize 15-foot wide drills (47.2%) for seeding soybeans.

What is the soybean seeding rate you will use with your drill?

2013	164,894
2012	163,795
2011	168,585
2010	167,024
2009	169,185

After a slight decline in 2012, the seeding rate for soybeans is expected to be up again in 2013.

If you use a planter for soybeans, what will be your row spacing?

	2013	2012	2011	2010	2009	5-Year Avg.
15 inches	44.6%	49.3%	44.9%	43.5%	46.6%	45.8%
20 inches	3.6%	5.3%	4.8%	3.7%	5.4%	4.6%
30 inches	43.9%	45.4%	43.3%	41.0%	35.7%	41.9%
Other	7.9%	N/A	7.0%	11.8%	12.3%	9.8%

Nearly all no-till soybeans are planted in either 15- or 30-inch rows.

What will be your soybean seeding rate with the planter?

2013	146,997
2012	147,486
2011	148,205
2010	150,954
2009	152,171

Soybean seeds per acre seeded with a planter have trended slightly downward during the past 5 years.

What soybean varieties and brands will you plant in 2013?

Soybean Varieties		Soybean Brands	
Roundup Ready	93.2%	Pioneer	42.3%
Conventional	6.8%	Asgrow	28.1%
LibertyLink	8.2%	Mycogen Seeds	5.1%
Other	1.3%	1 other seed brand	39.9%
		2 or more other seed brands	16.5%

When it comes to soybean varieties, Roundup Ready clearly dominates, while Pioneer is the soybean brand most often used by U.S. no-till farmers.

Corn Fertilization Practices

When did you or will you make nitrogen applications for the upcoming corn crop?

	2013	2012	2011	2010	4-Year Avg.
Fall	17.6%	17.0%	15.2%	12.7%	15.6%
Spring pre-plant	38.5%	40.0%	38.5%	39.7%	39.2%
At-plant	62.5%	62.5%	61.9%	52.9%	60.0%
Sidedress	60.9%	63.7%	58.1%	55.2%	59.5%
Foliar	15.4%	15.0%	9.6%	9.8%	12.5%

Nitrogen application for corn is most often done during planting or as a sidedress operation.

What forms of nitrogen will you use for the upcoming corn crop?

	2013	2012	2011	2010	4-Year Avg.
28%	52.7%	47.0%	50.0%	46.7%	49.1%
32%	31.1%	31.9%	28.9%	25.7%	29.4%
Anhydrous Ammonia	24.3%	28.5%	23.2%	25.1%	25.3%
Urea	22.3%	24.5%	22.8%	18.0%	21.9%
Ammonium Sulfate	30.9%	26.8%	20.9%	19.5%	24.5%
Ammonium Nitrate	4.4%	5.0%	5.1%	5.7%	5.1%

More than half of nitrogen applied to corn is a 28% blend.

How much nitrogen do you plan to apply vs. your targeted yields for corn?

	2013	2012	2011	2010	4-Year Avg.
Less than 0.8 lb./bu.	15.3%	14.9%	13.4%	16.9%	15.1%
0.8-0.99 lb./bu.	45.7%	46.2%	45.3%	41.7%	44.7%
1.0-1.2 lb./bu.	36.8%	36.1%	38.8%	39.0%	37.7%
More than 1.2 lb./bu.	2.2%	2.7%	2.6%	2.4%	2.5%

More no-tillers are applying less than 1 pound of nitrogen vs. their targeted yeild goal.

If you're raising cover crops ahead of corn, how much nitrogen do you expect to obtain from cover crops?

	2013	2012	2011	2010	4-Year Avg.
Less than 40 lb./acre	69.0%	68.6%	67.4%	70.9%	69.0%
40-80 lb./acre	29.1%	27.1%	28.5%	27.2%	28.0%
81-120 lb./acre	1.6%	3.9%	3.2%	2.0%	2.7%
More than 120 lb./acre	0.3%	0.4%	0.9%	0.0%	0.4%

The majority (69%) of no-tillers who raise cover crops ahead of corn expect to obtain less than 40 pounds of nitrogen per acre.

When did you or will you make phosphorus applications for the upcoming corn crop?

	2013	2012	2011	2010	4-Year Avg.
Fall	40.8%	41.1%	38.7%	28.9%	37.4%
Spring pre-plant	39.3%	38.5%	32.2%	32.7%	35.7%
At-plant	49.3%	54.0%	56.2%	46.9%	51.6%
Sidedress	3.0%	1.9%	2.9%	1.9%	2.4%
Foliar	4.4%	3.4%	4.0%	2.8%	3.7%

A little less than half of no-tillers apply phosphorus to corn at planting, but spring pre-plant and fall applications are also popular.

When did you or will you make potassium applications for the upcoming corn crop?

	2013	2012	2011	2010	4-Year Avg.
Fall	44.9%	43.3%	43.8%	29.9%	40.5%
Spring pre-plant	42.1%	48.0%	39.7%	39.3%	42.3%
At-plant	33.5%	37.3%	37.3%	30.8%	34.7%
Sidedress	3.4%	3.3%	3.6%	2.8%	3.3%
Foliar	5.6%	3.3%	4.5%	3.8%	4.3%

No-till farmers apply potassium to their corn crop at various times with the most prevalent being in the fall.

Will you apply any of the following fertilizers for the upcoming soybean crop?

	2013	2012	2011	2010	4-Year Avg.
Nitrogen	30.3%	32.8%	30.4%	21.7%	28.8%
Phosphorus	72.6%	72.3%	72.0%	49.7%	66.7%
Potassium	79.6%	76.8%	79.6%	50.1%	71.5%
Micronutrients	55.0%	51.8%	50.0%	28.5%	46.3%

Potassium and phosphorous are the fertilizers most often used by no-tillers for soybeans.

When will you apply fertilizer for the upcoming soybean crop?

	2013	2012	2011	2010	4-Year Avg.
Fall	38.2%	39.4%	35.6%	18.3%	32.9%
Spring pre-plant	44.5%	46.5%	46.5%	33.3%	42.7%
At-plant	27.0%	24.3%	25.0%	16.6%	23.2%
Sidedress	2.0%	1.9%	1.9%	0.8%	1.7%
Foliar	25.9%	23.5%	22.9%	15.7%	22.0%

No-till soybean growers most often fertilize in the spring prior to planting.

Will you use inoculants for your soybeans?

	2013	2012	2011	2010	4-Year Avg.
Yes	82.5%	82.3%	66.2%	71.6%	75.7%
No	17.5%	17.7%	33.8%	28.4%	24.35%

More than 75% of no-till producers have utilized inoculants with soybeans over the last 4 years.

General Fertilization Practices

Did you apply lime last year?	
Yes	47.9%
No	52.1%

More than half of no-till farmers did not apply lime in the past year.

If you applied lime last year, what type did you apply?

	2013	2012	2011	2010	4-Year Avg.
Dolomitic	45.6%	38.3%	46.7%	37.9%	42.1%
Calcitic	53.6%	50.8%	50.0%	52.2%	51.7%
Other	8.0%	10.9%	11.9%	9.8%	10.2%

Of the no-tillers surveyed who applied lime last year, more than half used calcitic lime.

What micronutrients did you apply to your cropping acreage last year?

	2013	2012	2011	2010	2009	5-Year Avg.
Sulfur	69.3%	66.5%	60.4%	52.4%	44.4%	58.6%
Zinc	62.0%	60.4%	53.2%	48.4%	45.4%	53.9%
Boron	34.6%	32.9%	29.1%	25.3%	17.9%	28.0%
Magnesium	20.7%	25.8%	21.3%	17.4%	14.4%	22.3%
Calcium	20.9%	19.6%	17.5%	13.6%	12.8%	16.9%
Copper	13.5%	12.1%	11.8%	9.6%	5.1%	10.4%
Molybdenum	11.5%	8.5%	7.0%	5.9%	4.0%	9.2%
Iron	10.5%	8.1%	6.2%	7.0%	3.6%	8.9%
Chloride	6.1%	3.3%	4.2%	3.3%	1.5%	3.7%

No-till farmers utilized a wide variety of micronutrients in the cropping practices, with sulfur and zinc used most often.

Did you apply gypsum last year?

	2013	2012	2011	2010	2009	5-Year Avg.
Yes	17.0%	17.7%	13.7%	9.9%	4.9%	12.6%
No	83.0%	82.3%	86.3%	90.1%	95.1%	87.4%

While most no-tillers don't apply gypsum, its use has increased over the last five years.

Did you apply manure last year?

	2013	2012	2011	2010	2009	5-Year Avg.
Yes	43.2%	46.8%	33.1%	52.2%	39.5%	43.0%
No	56.8%	53.2%	66.9%	47.8%	60.5%	57.0%

On average, 43% of no-tillers applied manure to some of their fields during the past 5 years.

What manure source did you apply last year?
(percentage of growers who said they applied manure)

	2013	2012	2011	2010	2009	5-Year Avg.
Cattle	70.7%	66.7%	64.9%	59.7%	68.7%	66.1%
Hogs	23.6%	25.3%	19.0%	19.2%	21.7%	21.8%
Poultry	27.2%	27.8%	27.0%	16.7%	30.9%	26.0%

Cattle manure (70.7%) is used most often by no-till farmers.

Operating Expenses

What do you estimate were your total operating expenses last year?

2012	$479,608

No-till farmers report that their overall operating expenses saw a slight rise in 2012 vs. 2011. In 2011 they spent $473,240.

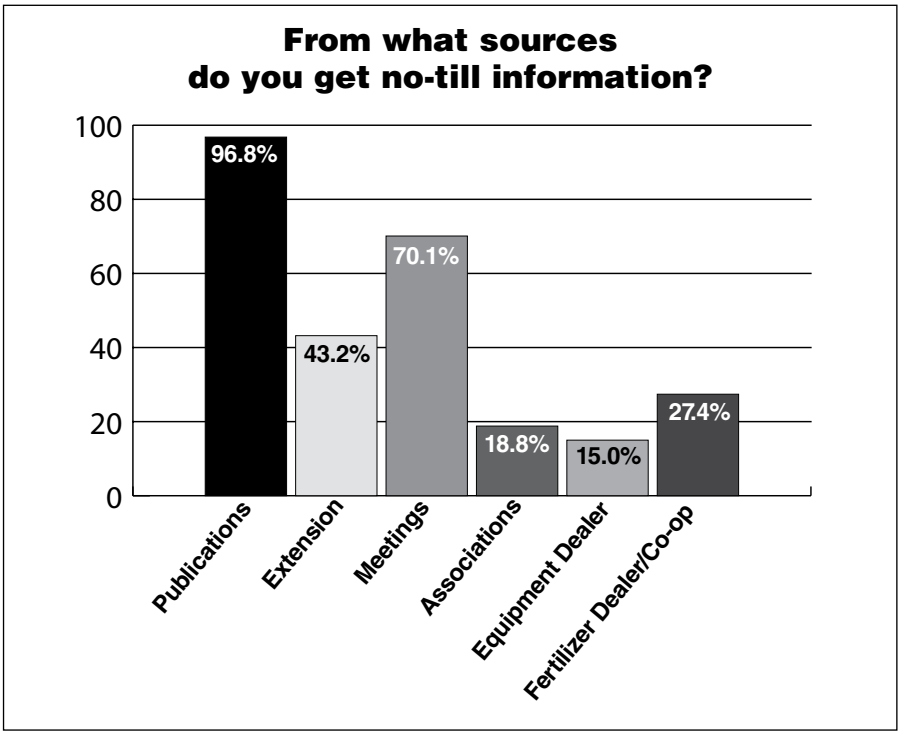
How much do you estimate your entire farming operation spent for the following:

	2012	2011	2010	2009	2008	5-Year Avg.	Estimated 2013 Costs
Fuel	$23,176	$22,786	$16,872	$20,718	$26,236	$21,958	$23,875
Land rent	$75,534	$77,533	$62,600	$58,821	$61,183	$67,134	$84,606
Seed/Seed Treatments	$60,521	$56,464	$47,210	$49,436	$46,084	$51,943	$62,222
Pesticides	$33,706	$29,065	$29,203	$33,572	$34,095	$31,928	$34,668
Fertilizer	$94,713	$86,914	$58,896	$67,964	$75,936	$76,885	$94,854
Lime/Soil Conditioners	$10,226	$10,878	$ 8,468	$10,020	$11,752	$10,269	$11,516
Equipment	$70,900	$71,252	$65,957	$52,688	$63,693	$64,898	$59,337
Machinery Service	$15,128	$16,256	$13,305	$16,088	$18,467	$15,849	$14,090
Machinery Parts	$18,536	$18,194	$17,485	$17,318	$16,991	$17,705	$16,338
Precision Equipment	$6,839	$8,864	$7,980	$7,502	$7,957	$7,828	$6,974
Custom App./Hauling	$12,860	$13,636	$11,647	$12,360	$13,440	$12,788	$12,384
Labor	$36,897	$41,633	$28,533	$26,034	$29,105	$32,440	$37,777
Interest	$20,572	$19,760	$20,308	$22,324	$22,465	$21,086	$20,694
Total	**$479,608**	**$473,240**	**$388,464**	**$391,845**	**$427,404**	**$432,112**	**$479,335**

Expenses remained relatively stable in 2012 compared to 2011, when no-tillers saw a considerable increase.

Education & Training

From what sources do you get no-till information?					
	2013	2012	2011	2010	4-Year Avg.
Publications	96.8%	97.8%	97.8%	94.5%	96.7%
Extension	43.2%	36.7%	37.3%	37.2%	38.6%
Meetings	70.1%	67.3%	63.1%	64.5%	66.3%
Associations	18.8%	15.3%	13.1%	11.5%	14.7%
Equipment Dealer	15.0%	13.5%	14.3%	18.3%	15.3%
Fertilizer Dealer/Co-op	27.4%	24.3%	23.5%	29.3%	26.1%



No-till farmers rely most on ag publications and meetings as their major sources of information on no-till farming practices.

Have you ever attended the National No-Tillage Conference?						
	2013	2012	2011	2010	2009	5-Year Avg.
Yes	34.5%	27.3%	27.1%	26.5%	22.8%	27.6%
No	65.5%	72.7%	72.9%	73.5%	77.2%	72.4%

Just over a third of no-till farmers have attended one or more National No-Tillage Conferences.

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