A Brief Look at Cover Crops, Type of Tillage, and Tile, *2017 Census of Agriculture*

Carl Zulauf and Ben Brown, June 2019

The *2017 Census of Agriculture* contains questions regarding the use of cover crops, type of tillage used, and prevalence of tile and artificial ditches. This article briefly reviews the responses for Ohio and the US.

**Cover Crops:** Acres planted to cover crops in Ohio doubled between 2012 and 2017: 357,292 to 717,759. The acres in 2017 are 7% of Ohio harvested cropland (see Figure 1). Cover crops are a larger share of 2017 harvested cropland in Ohio than the US, a change from 2012 when Ohio and US shares were similar. The Census question defined cover crops as “...planted primarily for managing soil fertility, soil quality, and controlling weeds, pests, and diseases” and directed respondents to “exclude CRP acres.”

**Figure 1.** Acres planted to cover crops as a share of harvested cropland, Ohio and US, *2012 and 2017 Censuses of Agriculture*

<table>
<thead>
<tr>
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<th>2017</th>
<th>2012</th>
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<tbody>
<tr>
<td>Ohio</td>
<td>7.0%</td>
<td>3.5%</td>
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<tr>
<td>US</td>
<td>4.8%</td>
<td>3.3%</td>
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Exceptions exist, but cover crops are usually more common north than south of Interstate 70. This likely reflects in part the local and national attention on water quality in Lake Erie and the Western Lake Erie basin. This attention has spurred calls for wider adoption of cover crops to retain nutrients and soil. Nevertheless, highest share of harvested cropland in cover crops is for Knox County at 17%. Change in use of cover crops since 2012 cannot be evaluated as county data on cover crops was not reported in the 2012 Census.
Tillage: The 2017 Census asked how many acres were no-tilled, conservation tilled excluding no-tilled, and conventionally tilled. Share of acres in each tillage systems is computed using the sum of acres reported in the 3 systems. This sum is less than total cropland and total harvested acres. No till is used on a larger share of Ohio than US acres and is the most common tillage system in Ohio, but its share in Ohio did not increase from 2012 to 2017 (see Figure 3). The major change in tillage between 2012 and 2017 for both Ohio and the US is a shift from conventional to conservation tillage other than no-till. Conventional tillage is less common in Ohio than the US. Instructions provided to respondents noted, “Conservation tillage leaves 30 percent or more of the soil surface covered by crop residue after planting. Conventional tillage has 100 percent of the soil surface mixed or inverted.”

A summed acreage breakdown of the 3 practices for Ohio’s 88 counties are presented in Figures 4, 5, and 6. Two features stand out. One is that no-till is most common in south-central and south-eastern Ohio, likely reflecting the topography of these areas (see figure 6). The second is the large variation that can occur between neighboring counties for a given tillage practice. This may reflect a variety of factors, including local soil and topography conditions; but it also raises the potential role of champions for a practice. In short, understanding tillage in Ohio starts with understanding why the shares vary so much for neighboring counties and why individual farmers select their tillage practice.
Figure 5. Share of Ohio acres by tillage practice - conventional tillage, by county, 2017 Census of Agriculture

Figure 6. Share of Ohio acres by tillage practice - no-till, by county, 2017 Census of Agriculture
Drainage: As a share of cropland, acres drained by tile to remove excess water from the soil subsurface is much larger in Ohio than the US (49% vs. 14%) (see Figure 7). The share of cropland that is tiled increased between 2012 and 2017 for both Ohio and the US. In contrast, the share with artificial ditches remained approximately the same. Instructions to respondents stated “Land drained by ditches refers only to manmade ditches installed to improve drainage, not natural waterways.”

Northwest Ohio has the highest share of harvested cropland acres drained by tile (see Figure 8). All counties in this region have at least 50% of harvested cropland tiled, and most have more than 60%. The highest share is 90% in Henry County. The share decreases as you move south and east within Ohio, with topography and soil type likely being important reasons.
Summary:
► Ohio farms plant a greater share of acres to cover crops, but the share is single digits for both the Ohio and the US.
► Cover crops are more prevalent in northern than southern Ohio, but their use is limited in all regions of Ohio. The focus on Lake Erie water quality likely explains some of these regional differences.
► Relative to US farms, Ohio farms rely more on no-till. Within Ohio, no-till is more prevalent in the south-central and south-east regions.
► The 2017 Census raises the possibility that no-till’s share for Ohio has plateaued at around 50%.
► The major change in tillage practice from 2012 to 2017 for both Ohio and the US is a shift from conventional tillage to conservation tillage other than no-till.
► Relative to US farms, Ohio farms rely more on tile. Use of tile is most common in northwest Ohio.

Sources: