



Conservation Discussions

By Bryon Kirwan, Central National Agriculture Economist

To Till, or Not To Till

“whether ‘tis nobler”....

I was recently in a meeting where colleague commented....” I just don’t see why they simply don’t no-till their farms....”

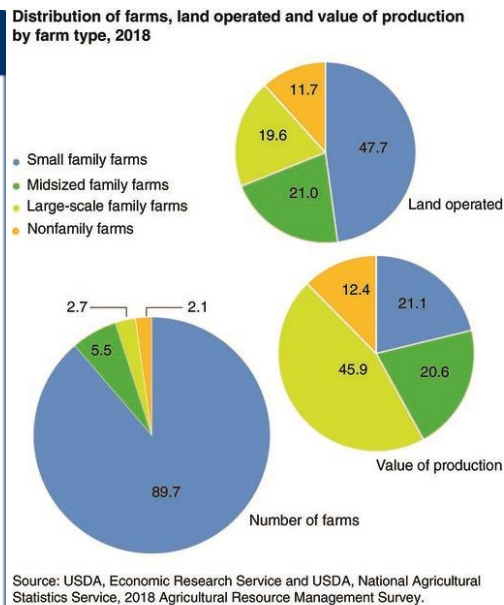
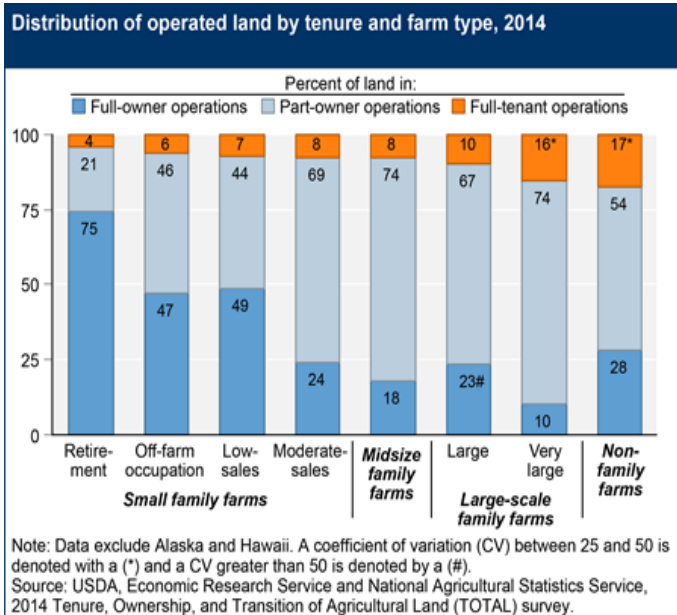
The tillage type employed upon farms is just one of many different production and management decisions that need to be made in the operation of the farm business. The variables underlying these decisions are different in every farm business; and may even vary by tract within that business. Let’s consider some key variables that affect the tillage decision-making process.

What are the owner’s desires?

Land is the limiting basis for most farm operations within the United States. Farms vary in size and scale depending on location, type of farm, type of soil, applicable practices, etc. It is important to note that a significant number of acres are rented by producers. To successfully rent a farm, the needs of the owners will need to be met. If an owner has a desire to see a certain management type utilized on their farm, it is likely the individual renting that land will utilize that management type (at least on that parcel) or they will likely not be (or continue) renting the farm. *The key point being made is that the operators renting the farm may not have full decision-making authority to elect certain management changes.*

Census data could lead a conservationist to believe satisfying owner desires should not be a significant concern, as per the 2017 Agriculture Census, nearly 70% of the farms are fully owned. (hence single, full authority decision maker) However, this data overlooks size, class, and scale. Data from the 2017 Agriculture Census indicates there are 1,408,961 farms that are full ownership farms, but note they are clustered in the smaller farm size categories. 972,874 of the 1,408,961 (69%) of the full owner farms are under 100 acres. Some specialty farms may generate large returns on small acreages. However, commodity production and non-specialized livestock with grazing typically take larger acreages to be economically viable.

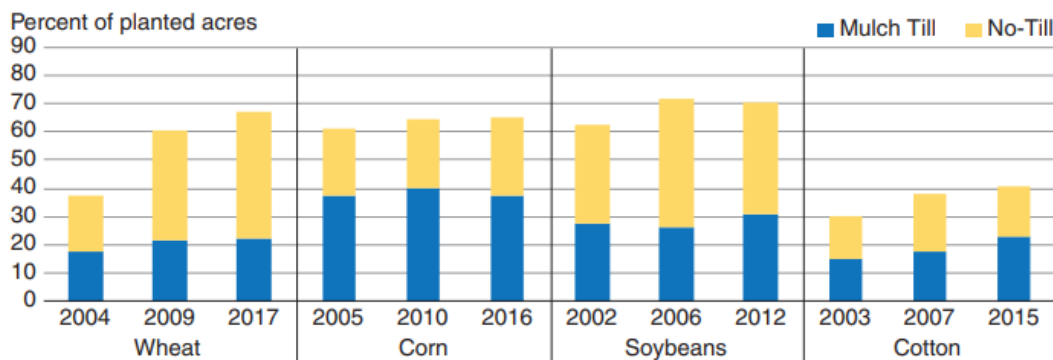
This point is well supplemented with data from the Economic Research Service (ERS): Smaller family farm operators (especially retirement farms) are more likely to be full owners of land they operate. Forty-five percent of farmland is in small family farms, and nearly half (46 percent) of this land is found in operations that own all the land they operate. Fifty-one percent of land in farms is in midsize and larger family farm operations, which are most commonly a mixture of rented and owned land. Nonfamily farms account for 4 percent of all farmland, 28 percent of which is found in full-owner operations. The ownership of farms does not necessarily correlate with the area of land operated or the value of production. Most farms are small family farms, and they operate almost half of U.S. farm land, while generating 21% of production. This is illustrated as follows:



What crop(s) are being grown? For Whom? And Where?

No-Till can be a highly successful part of a farm management system. It is utilized on many farms across the landscape. However, no-till, like any other management practice is seldom effective across all crops and management considerations in all locations. Many farmers who use no-till use it on only a portion of their crop acreage, suggesting that no-till is not necessarily used continuously on these farms. Partial adoption may meet the needs of many owners and operators; and still provide production flexibility.

Trends in conservation tillage adoption



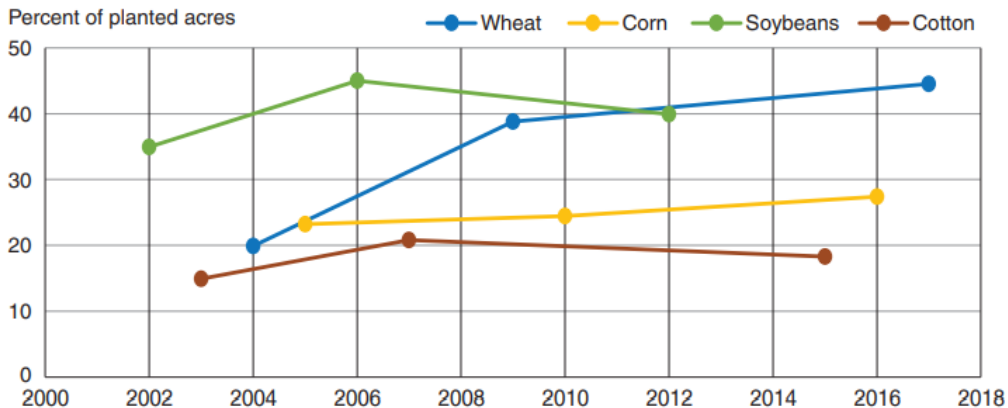
Note: Mulch till is land with tillage and a Soil Tillage Intensity Rating less than 80.

Source: USDA Economic Research Service, based on USDA Agricultural Resource Management Survey (ARMS) data for 2002-2017.

Some fields are tilled, then land leveled to promote irrigation efficiency, and to prevent erosion (sounds counter intuitive I know. Check out farming in the Everglades Agricultural Area (EAA)). Many high value crops such as fruits and vegetables are grown in the EAA, in addition to rice, sugarcane, and sod.

Organic production may be accomplished utilizing a no-till management system, but it is not normally utilized in all crops in an organic crop rotation.

No-till adoption, 2002-2017



Note: No-till is based on the absence of tillage operations reported in the Agricultural Resource Management Survey (ARMS).

Source: USDA Agricultural Resource Management Survey data for 2002-2017.

Isn't No-Till less expensive?

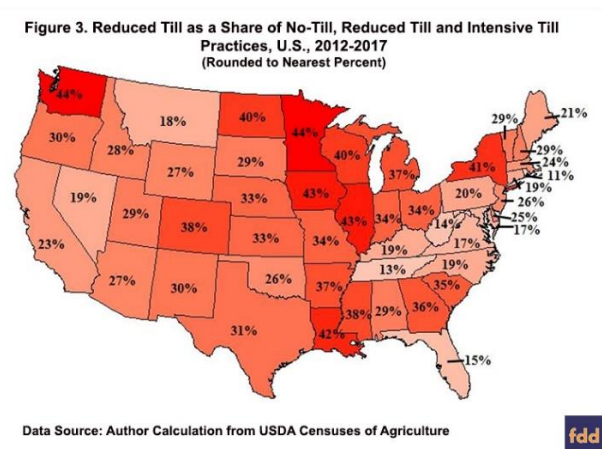
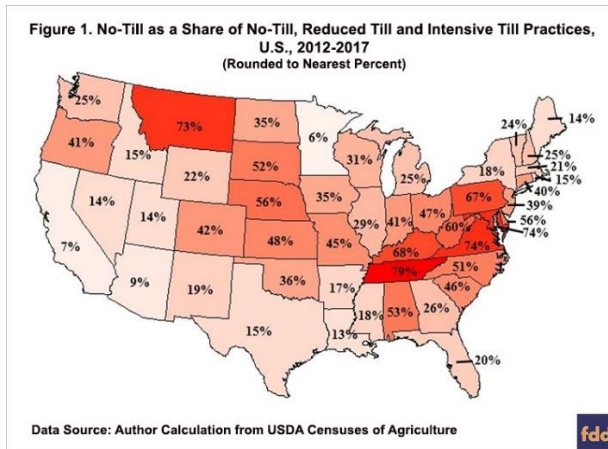
The answer to this question is MAYBE. In no-till, there are less tillage/draft passes across fields than in reduced till or conventional tilled fields. So, there would be operational savings from those fewer passes. Depending on the management system in place, those savings from reduced field passes could be offset by higher herbicide usage and other costs.

Conservationists have asked if the machinery cost does not go down overall because of not needing to own high horsepower tractors or tillage equipment, since they can farm with smaller equipment. The best answer is perhaps. For example, a high horsepower tractor. Tractors typically have more than just one use on a farm. A high horsepower tractor that pulled a field cultivator may be the same tractor that pulls a grain cart during harvest. So, the need for the tractor is still there, and it would still need to be owned. The question would revolve around the need and expense for a field cultivator.

Additionally, it may not be realistic to believe a farm business that has grown to where it operates a 24-row planter in a reduced till environment would be willing to accept planting with an 8 or 12 row planter in a no-till environment. There are risk and timeliness issues that need to be considered when changing equipment sizes. No-till does not necessarily equate smaller equipment needs.

What are the needs of other owners the operator may farm for? Perhaps they expect tillage to be utilized to control weeds in place of herbicide use. Ultimately, the difference in the cost of the tillage operation is the most likely economic gain in many no-till settings, as the tillage equipment may be needed on other farms. The gains from reduced tillage passes can be economically significant.

Following are illustrations of the percentage of land by state in no-till and reduced tillage regimens. This data is based upon information from the 2017 Agriculture Census. Note the significant variation that occurs between states; even those with similar soils and climates. This would infer that there is more than the utilization of a tillage type at issue. The maps are additive; intensive till would be the remaining percentage from the no-till and reduced till maps combined.



Summary

Tillage or No-Tillage are just a small part of the management considerations given to the operation of a farm business. As conservationists, we need to understand and accept that many different management types are effective, efficient, profitable, and achieve the goals of **both** the owner and producer; and may achieve conservation goals as well. We should continue to work with the owners and operators to encourage them to experiment, look at different production systems, practices, etc. that we believe would be advantageous to them. However, we must caution ourselves not to act as if we know more than our cooperators do; or treat them differently if they do not accept our counsel. As conservationists, we are working to help support the business and the landscapes these individuals are operating.

References:

Economics Research Service *Conservation Practice Adoption Rates Vary Widely by Crop and Region* https://www.ers.usda.gov/webdocs/publications/44027/56332_eib147.pdf?v=8846.2

Economics Research Service *Farmland Ownership and Tenure* <https://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/farmland-ownership-and-tenure/>

Economics Research Service *Tillage Intensity and Conservation Cropping in the United States* <https://www.ers.usda.gov/webdocs/publications/90201/eib-197.pdf?v=5124.4>

FarmdocDAILY *Tillage Practices, 2017 US Census of Agriculture* <https://farmdocdaily.illinois.edu/2019/07/tillage-practices-2017-us-census-of-agriculture.html>