# To till or not to till... (I.A.)

***What does tillage mean? What is the best way to prepare a field for planting?***

Tillage is a step for many farmers in preparing a field for planting. Other words for tillage include plowing or cultivating. In general, it is cutting through the soil using an implement or tool created for that use, usually an implement that is pulled behind a tractor. There are many reasons for tillage:

- to turn residue from the previous crop under the surface so it will decompose and leave nutrients in the soil
- to break the soil crust to make it favorable for planting
- to warm the soil by exposing it to the sun
- to manage weeds

There are several different tillage methods:

Conventional tillage – turns over the soil. This technique may include a moldboard plow, a chisel plow or another implement to prepare the seedbed for planting.

Strip tillage – breaks open a furrow in the soil about 2-4 inches wide for ease of seed and fertilizer placement.

Some farmers may choose to stop tilling and use no-till methods. This land management practice does not include plowing or cutting through the soil to turn it. However, this technique may require an herbicide treatment prior to planting so that any growth that has occurred before planting begins is killed off so it will not compete with the crop that will be planted.

## Procedure

1. Read this article: "Comparing and Selecting a Tillage System" https://cropwatch.unl.edu/tillage/comparison/ to gain an understanding of what some farmers have decided about tillage and why.
   - Highlight vocabulary that you don't understand as you are reading and share those words back with the class after reading. As a group, define those words.
2. Watch this video: *Soil Slake and Infiltration Test* - Ray Archuleta https://www.youtube.com/shorts/ND53qLVkpJ8 to see the differences in soil structure (how the soil holds together or slakes (comes apart) in aggregates and pore spaces) and infiltration of rain water due to tillage practices.
3. Read this article: "When does no-till yield more? A global meta-analysis" (http://www.sciencedirect.com/science/article/pii/S0378429015300228)
4. Read this article: "No-tillage enhances soil water storage, grain yield and water use efficiency in dryland wheat (*Triticum aestivum*) and maize (*Zea mays*) cropping systems: a global meta-analysis" (https://connectsci.au/fp/article/51/5/FP23267/55728/No-tillage-enhances-soil-water-storage-grain-yield)
5. Go to the Decision Tracker (row I.A.) to enter your decision (There is no result for this decision in this simulation, since no till requires different practices and there are trade-offs to using it.)

## Reflection

1. Describe your decision, to till or not to till, for the purposes of this activity and list at least two pieces of evidence for your choice from the video and/or the articles.

2. Discuss and compare your decision with your table group. What are their decisions and why did they make them? What factors must be considered to make this choice?