

Essential Question: Is no-till a no-brainer for Washington wheat farms?

Background



Figure 1: Tilled field from Mykura, Nigel. *Freshly Tilled Field*, geograph.org.uk/p/4200214



Figure 2: Crop residue from Burton, Rodney. *Grain Maize Stubble*, geograph.org.uk/p/724310

Vocabulary

no-brainer: A very easy or obvious choice, decision, or solution (So easy or obvious that it is humorously said to require no brain)¹.

conventional: done the usual way.

no-till (direct seeding): a farming practice where residue is left on the field and new seeds are planted into the covered soil.

residue: parts of the plant that are not harvested (i.e. roots, stem).

sustainable: crop growth is balanced with soil health and environmental stewardship.

erosion: the loss of soil from a field by wind or water.

No-till or **direct seeding** is a farming practice that skips the **conventional** step of **tilling** before planting seeds in the ground. The ground in figure 1 has been **tilled** - the soil has been broken up and turned over to remove weeds and leftovers from last season's harvest and prepare the field for planting new seeds.

The field shown in figure 2 has not been tilled and seeds will be planted by drilling directly into the soil through the **crop residue**, or the remains of last season's plants that have been left on the field after harvest.

No-till and direct seeding are lauded by many as a **sustainable** farming practice. These low-disturbance practices can protect against soil **erosion**, reduce carbon dioxide emissions, and save farmers money by reducing labor and fuel costs. So, **Is no-till a no-brainer for Washington wheat farms?**

1. MARK THE TEXT

Underline claims the author makes and any pieces of information and evidence that are relevant to the Essential Question. A claim is the idea (or ideas) the author will show you or try to convince you of.

Circle the vocabulary words listed in the box above if you find them in the text. These words might clue you into places where there is evidence in the text.

Put a question mark above any other word you need to look up to help you best understand what the author is saying.

2. CONNECT AND RESPOND

Use these symbols to mark sentences or paragraphs in the article. Explain your connections or responses in the **margin**. Include at least two of the following:

- Something you have a connection to (Do you know something else about the point the author is making? Did you learn this information in another place?)
- + Something you agree with
- × Something you disagree with or have a counterclaim for
- △ Something that changes what you thought at first
- ~ Something you have a question about or don't understand yet

¹no-brainer. (n.d.) *Farlex Dictionary of Idioms*. (2015). Retrieved July 8 2021 from idioms.thefreedictionary.com/no-brainer

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Rounding up the gains of conservation tillage: No-till, direct seeding have many benefits, but one important tool is causing conflict
Wheat Life Magazine May 2020 by Trista Crossley

- 1 There's very little disagreement that no-till and direct seed cropping systems are responsible for dramatic improvements in soil health and a reduction in erosion in Eastern Washington. There is, however, lots of disagreement over one of the main tools that makes those cropping systems viable—herbicides, especially glyphosate (also known commercially as Roundup).
- 2 One of the main obstacles growers face when practicing no-till and direct seeding is the management of weeds, volunteer crops and disease, which in conventional farming is done, at least in part, by more tillage. If a farmer doesn't want to till their fields, they have to turn to other methods.
- 3 "Where other people sometimes have the capacity to take care of weeds and other challenges with tillage, in direct seed and no-till operations, we utilize glyphosate to keep from doing a lot of tillage on the ground," Ty Meyer, director of the Pacific Northwest Direct Seed Association (PNDSA) explained. "There's multiple benefits to that. One being that we are not disturbing the ground enough to have to deal with heavy erosion during critical periods around the region."
- 4 Another reason farmers need to kill any plants in a field before seeding is to prevent the "green bridge." That term refers to the ability of plants, usually weeds or volunteer crops from the previous year, to harbor pests and diseases and pass them onto the new crop. So herbicides provide both weed control and disease control for no-till and direct seed farmers.
- 5 "I think glyphosate has really enabled producers to advance these systems and become successful in conservation-based systems," Meyer said. "Without tillage, you need another tool to be able to manage (weeds and disease). That's been glyphosate, which up to this point, has been one of the main tools."
- 6 That's certainly true for Larry Cochran, a Whitman County wheat farmer who transitioned to 100 percent direct seeding about 15 years ago after experimenting with the practice since the 1970s. As a child, he recalled seeing erosion ditches so big a combine couldn't cross them.
- 7 "Erosion in the Palouse area was always horrendous," Cochran said. "My analogy when talking about no-till/direct seeding is it is a puzzle, and glyphosate was the final piece to complete the puzzle. We had farmers trying no-till before Roundup came out, and they could get by one year, but then it would be a disaster. They couldn't get rid of [weeds]."

8 Up in Douglas County, Howard McDonald and his son, Travis, started transitioning some of their ground to direct seeding five years ago and use glyphosate to help control weeds. McDonald has also seen huge improvements in wind and water erosion but admits there's a learning curve as he figures out how to deal with crop residue.

9 "We don't have big dust storms like we used to," he said. "Glyphosate is a tool, and we use it on both our conventional ground and direct-seeded ground."

10 Today, Meyer estimates that more than 50 percent of the cropland in Eastern Washington is either in no-till or direct seed systems. PNDSA estimates that reduced soil disturbance and increased crop residue on the soil's surface can reduce water and wind erosion by at least 90 percent, improving air and water quality. Other benefits of conservation-based tillage systems include increased water retention in the soil; improved soil health; reduced soil compaction; reduced fuel costs and greenhouse gas emissions; and better wildlife habitat.

11 Cochran said since moving to 100 percent direct seeding, he's increased his production while decreasing expenses, mainly in the amount of fuel he uses. He also says his soil structure is much better.

12 "I've got these clay ridges that used to turn to marbles after plowing them. I couldn't do anything to them after that. Now, after Rounduping those hills and seeding them, the ground is mellower and works better. My organic matter is increasing, and yields are increasing. The erosion is almost gone," he said.

13 McDonald has also seen an improvement in the soil he direct seeds.

14 "I'm gradually seeing places that didn't grow wheat or had no straw now getting some straw and micro-organisms," he said.

15 The use of glyphosate isn't without criticism. While the Environmental Protection Agency has determined that glyphosate does not cause cancer when used according to label instructions, that hasn't stopped consumers from filing lawsuits against Monsanto, which originally produced Roundup, and then Bayer AG, which acquired Monsanto in June 2018. Some states and other countries have either banned the use of glyphosate or are attempting to ban it.

16 Any producer who applies glyphosate is required to have an applicator's license and be trained on the proper use of the chemical. If glyphosate is banned, growers will need to find other ways to control weeds and volunteer plants. Meyer suggests those methods might not necessarily be chemical in nature. He pointed to research showing that cover crops and more diverse crops can help in limiting unwanted growth.

17 “Certainly, I think we will see successful operations without glyphosate in the future, but it’s dependent on what alternatives there are, and what we will do to manage some of the issues that will pop up if we don’t have a tool like that,” Meyer said. “Glyphosate is just one tool, and there are other tools in the toolbox in the form of chemicals that could potentially be used, but they may be more expensive and have different impacts on the system. I’m not going to judge one or another. The challenge I see for us, maybe it’s not just a glyphosate issue. Maybe it’s a chemical or pesticide issue we are dealing with overall. The focus is on glyphosate, but what else can we do? What can we change on our farms that’s under our own control to have an impact on reducing the use of some of these inputs to manage diseases and weeds?”

18 Without glyphosate as a tool to control weeds, McDonald said he’d have no other choice but to till his ground. He pointed out that there’s a generation of farmers who haven’t raised wheat any other way but no-till or direct seeding, and many of them don’t even have the right equipment for conventional tillage.

19 “There’s a lot of young farmers who are very good farmers and passionate about what they do (direct seeding and no-till),” he said. “But unless we have another tool like Roundup, kids wouldn’t know how to run this older equipment. Glyphosate is only a tool. If there’s a better mousetrap out there, tell us what it is, and let us use it.”

20 Cochran isn’t sure what he’d do.

21 “I wrack my brain trying to think what I would do (without glyphosate),” he said. “I still have the tillage equipment to go back to the old way, but I don’t want to destroy what I’ve spent the last 40 years building.”

Adapted from Crossley, Trista. "Rounding up the gains of conservation tillage." *Wheat Life*, May 2020, wheatlife.org/t_0520_glyphosate.html.

Summary: Review the essential question and your annotations. Answer at least two of the following questions in the space below. What claim(s) does the author make about the essential question? Do you agree with the claims? Are they well supported by evidence from the article? What connections did you make that help you evaluate the author’s claim?

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Discussion Use the information on this page to help guide your discussion to answer the essential question. Remember to say just enough to make your point while leaving **room for others to speak**. It is okay for there to be **periods of silence** while you and your classmates think. (If it's quiet - **go back to your article** annotations and try a sentence starter below!) Make sure you respond to or question each other's ideas while you talk. Look out for times when you can clarify with evidence, ask questions about relevancy or accuracy of information, or identify a counterclaim.

Near the beginning

Give (and analyze) claims and evidence

My author claims...

My article says....but I think...

My article says...and I think...

In the middle

Evaluate information and look for connections and/or counterclaims

From what I know...because...

What does your article say about...

A counterclaim would be that...

Does anyone have more information about...

Does ... depend on having ... point of view?

Near the end

Answer the essential question

When you said...I thought...

Does the group agree that...?

Even though my article claims...I now think...

My article claims...and I think it is right because...

After listening to everyone's thoughts, I think...

Discussion Checklist

→ Share information by stating (at least 1)

- My article's claim, quoted directly from article**
- My analysis of the claim
- Relevant connection or background information**
- Evidence, quotes directly from article

→ Respond to others ideas by (at least 1)

- Pointing out a counterclaim
- Asking for examples
- Asking for evidence
- Saying more about others' ideas**
- Prompting someone else to respond

→ Show respect for others' ideas by (at least 1)

- Paying attention to people who are talking**
- Staying on-topic
- Re-engaging the group after a period of silence or if you go off-topic
- Monitoring time

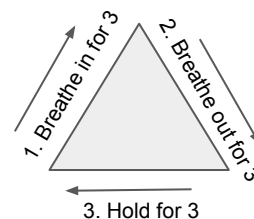
→ Answer the essential question by (at least 2)

- Saying my ideas about the essential question**
- Using evidence to back up my ideas**
- Providing a different answer or idea
- Giving OR asking for a summary

Nervous about speaking? It's normal.

Here are some things that might help:

Breathe. Use a triangle breath to regulate your nerves and prepare yourself to speak.



Go back to your article and look for where you noted **personal connections** to the text. Speaking about something you have experience with may be easier in the group discussion.

Look at the sentence starters above. Write out what you are going to say by filling in the blanks and be on the lookout for when to add your thoughts.

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Reflection Think about what you read and what others said in the group discussion to answer the following questions.

1. What did you get out of this activity?
- | | | | |
|---------------------|--------------------------------|-----------------------------------|-------------------------------------|
| I learned | <input type="checkbox"/> a lot | <input type="checkbox"/> a little | <input type="checkbox"/> nothing |
| I participated | <input type="checkbox"/> a lot | <input type="checkbox"/> a little | <input type="checkbox"/> not at all |
| My thinking changed | <input type="checkbox"/> a lot | <input type="checkbox"/> a little | <input type="checkbox"/> not at all |
| I enjoyed it | <input type="checkbox"/> a lot | <input type="checkbox"/> a little | <input type="checkbox"/> not at all |

2. Choose a stem from above and say more. For example, *I participated a lot because the article I read had good evidence for the essential question or My thinking changed not at all because I agreed with the article's claim and we did not find any credible counterclaims during our discussion.*

3. How would you answer the essential question in 3-5 sentences? Consider the claims and evidence from your article, along with connections, background information, and counterclaims and evidence brought up during the discussion.