

Researching agricultural problems

How might technology help to solve agricultural problems?

The goal of this unit is to encourage students to use technology to develop solutions to problems in agriculture. The resources provided here will explain some current pressing issues. Remember, it is predicted there will be nearly 10 billion people in the world by 2050. Finding affordable and sustainable solutions to these problems is critical to increasing the food supply.

1. Read the article about five agricultural problems that are being researched. Nitrogen, topsoil, land conservation, pesticides and drought are discussed in Scientific innovations solving agricultural problems found here:
<https://allianceforscience.cornell.edu/blog/2017/04/scientific-innovations-solving-agricultural-problems/>
2. This is a link to the American Farm Bureau Federation. There are many issues they describe here: <https://www.fb.org/issues>
3. The Organisation for Economic Co-operation and Development describes three key challenges that are interwoven. These must be addressed in order for all of us to be fed.
<https://www.oecd.org/agriculture/key-challenges-agriculture-how-solve/>
4. The Breakthrough Institute is a global research center that identifies and promotes technological solutions to environmental and human development challenges. Check out this series of articles:
<https://thebreakthrough.org/issues/food/series-is-precision-agriculture-the-way-to-peak-cropland>
5. What is auto steer? Auto Steer is any technology that provides vehicles or implements with automated steering and positioning in the landscape. It is useful in farming because it can reduce the overlap between passes of machines, thereby cutting down on energy and time wasted as well as usage of expensive chemicals and fertilizers. It can also relieve drivers from the stress of driving very precisely for many hours and enables operations to continue when visibility is poor or at night. (taken from:
<http://www.controlledtrafficfarming.com/Info/Machine-Autosteer.aspx>) See:
<https://www.farmprogress.com/autosteer-here> for more information.
6. Unmanned aerial vehicles (UAV), known as drones, have some specialized capabilities. See this article for more information about UAV use in agriculture.
(<https://www.farmprogress.com/story-new-uav-technology-catching-fire-agriculture-13-148631>) Be sure to check out the specialized links included in the article.
7. Seed tenders and grain carts are two pieces of equipment that may be unfamiliar. A seed tender carries bulk seed to the field while planting, allowing a planter to be refilled with seed without making a trip back to the barn. Grain carts are used during harvest to collect the seed harvested from the harvester. Often, a grain cart must be moved into position to collect the grain from the harvester while it is parked. What if the grain could

be off-loaded from the harvester without a pause to the harvester? Ozobots have sensors that allow them to track with other ozobots. Could this function be used to create a follow-along simulation of a grain cart to a harvester?

<https://www.farmprogress.com/equipment/new-options-handling-seed-efficiently>;

<https://www.farmprogress.com/farm-progress-show/watch-driverless-tractor-pulling-grain-cart-fps>

8. Much of the data farmers collect using data management systems such as FieldView, Trimble or FarmLogs is not compatible across systems (i.e. data collected by Trimble cannot be read by FieldView). [ISOBUS standards](#) have changed that so data is available to farmers regardless of the system that collected it. How might these standards make data analysis easier? What adjustments must have been made to make them compatible? Are there other adjustments that should be made to make data more useful?

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