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Technology in Agriculture – New Ways of Raising Crops

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What's the one thing most of us use almost every day? You know, it's usually in your back pocket, purse, or sitting right next to you most of the day. Your smart phone, that's right. How about your work? Do you use a computer or something run with technology? More than likely, right? Agriculture and farmers aren't any different. Technology has most definitely not left them behind. Let's explore some of the things that farmers have access to.

Basic Equipment:
Let's get some definitions first. Tractors are fairly familiar to most people so there's no need to explore what those are. Self-propelled choppers are large tractor-like pieces of equipment that are specialized to chop alfalfa or corn fields for dairy cow feed. They run on their own power. Predecessors of these machines were pulled behind a tractor. The new choppers are much faster than the pull behind choppers. Combines are what most people think of when wheat is being harvested. In this area, combines are used for wheat, rye, and corn harvest.

Your Tractor can do what?
Just as you use the mapping feature on your phone to get to a new place which uses GPS, farmers use GPS to guide their equipment so there is no or very little overlap of tillage, fertilizer, pesticide, and seed. This practice is termed precision agriculture. Let's be clear about this, this means equipment is steering itself or" Auto Steer" as it's referred to.

New equipment comes with a baseline technology package that is certainly better than not having GPS. Older farmers will probably argue with that statement, but not having to worry about over-fertilizing or over-spraying can reduce costs on the farm by 6-8%. GPS is installed in the tractor at the factory and a farmer can choose to upgrade to a more accurate system called Real Time Kinematics (RTK). A GPS system can steer the equipment in the field, but because it isn't as accurate as RTK it has limited applications. RTK is accurate to the sub-inch, so farmers can not only turn on the Auto Steer feature for tillage, but it can put the tillage in between the rows of a crop. For example, a farmer wants to plant corn between last year's rows of corn stubble. With RTK that can happen with not only the tillage equipment, but with the planter too. Why is that important or helpful to the farm? In terms of productivity, it saves wear and tear on the farmer. It can also be helpful in capturing some unused nutrients from last year while allowing the corn stubble to break down further, plus it saves the equipment from having to work under the stubble. Microbes and other soil organisms will break down the stubble the longer it's left in the field which in turn helps make the soil healthier.

What else can else can RTK provide for the farmer? It can provide yield maps which tells the farmer how much a field produces and can map that for the entire field. If a spot on a field is under-producing, the farmer can then look at other factors as to why it underperformed. The sensor in the system can save the data for later use or you can look at the data while harvesting. Useful data to know on the fly is seeing what the moisture content of the chopped hay or corn. Too wet and the product is going to mold or leach water and nutrients. Too dry and the feed doesn't store well and isn't preserved like it should be.

GPS can also be used in the large irrigation systems called center pivots. Not only can the center pivots be turned on and off remotely through an app on a phone or IPad, but the pivot can be remotely told to move to a specific spot in its circle so that the farmer can plant, till, or perform other farm activities on that spot.

When talking with three of the local implement dealers, Ellens Equipment, Bader and Sons, and Ina Store, all three of the specialists said that farmers are using just the tip of the iceberg. Wayne Roper, from Ellens Equipment demonstrated how he can diagnose problems in a tractor or chopper remotely. He can then call a farmer and notify him that the tractor isn't performing at peak capability. Aaron Pluger, from Ina Store, mentioned that telematics will be updated and pushed into the newest tractors because it will save the service crew time and effort. The service crew can diagnose remotely and come out with the correct parts and only have to come to a farm once or twice for a problem. Each dealer offers training and support for their customers to varying degrees. One thing all the dealerships talked about is the need for more technicians in this field. Career opportunities are available in the technological side of agriculture.

Darwin and Bryan Eisenga, brothers and farmers in Osceola and Missaukee counties, use the RTK system in their equipment. The biggest advantage of the RTK is the repeatability. The program can save the information programmed into it and repeat it for the field each time they do something in that particular field. They also like the system because they know that they aren't wasting valuable resources to grow their crops.

Future Innovations

Variable Rate Technology is already used in many areas and somewhat in our area. VRT would hone in further on fertilizer, pesticide, and seed applications to deliver just what is needed in different parts of a field for optimal crop growth. Drones could be very useful in scouting fields for weeds and other pests and for remote monitoring of crops.

Why Should You Care?

Why should technology in agriculture be important to the average person? Farmers are conservationists and stewards of the land. They care for the resources entrusted to them in the best way they know how. Technology allows farmers to reduce fertilizer, pesticide, tillage, and diesel usage. This ensures a better landscape for all of us. One way a farm can show off their stewardship is to go through the Michigan Agriculture Environmental Assurance Program (MAEAP). For more information, please contact Jodi Venema DeHate. Jodi covers four counties in our area, and she can be reached directly at the Missaukee Conservation District at (231) 839-7193 or by email at jodi.dehate@macd.org.

Darwin Eisenga demonstrating his guidance system in his New Holland Tractor.

Darwin Eisenga Monitoring the controls in his climate controlled potato warehouse.