

Drones: Farms Flying into the Future

By Jodi DeHate
Wexford Conservation District

Coming soon to a farm near you: drones! The title sounds a bit futuristic and well, more like the SciFi channel than anything else. Like many other advances in technology in everyday life, drones are an advance that is easily adapted for use in agriculture.

Why drones?

What can a drone offer that is different from what is being done now? Using drones or Unmanned Aerial Vehicles (UAVs) is a faster and easier method of collecting data. It's not that it's necessarily different information, it's just a faster and easier method to collect data. For example, let's look at growing corn. Farmers begin scouting for pests in corn fairly early on in the growing stage for a couple of different reasons: the corn gets too tall to see much of anything when it is more than a few feet tall, and many pests harm the crop during this stage, and when it is taller. Trying to walk through those tightly packed stands is never a fun job nor, is it very productive. A drone can fly above the field and, with its various imaging sensors, it can find any problems that are in the field. This helps the farmer make a timely decision on what to do.

What can a drone actually do?

Drones collect images from sensors mounted on its body that can show things from just simple aerial views to multispectral imaging. Simple aeriels can show differences in soil types, highlight some crop issues like a fungus problem, or maybe a pest infestation, or even irrigation problems. NDVI imaging is one of those multispectral images that is widely used. NDVI stands for "Normalized Difference Vegetation Index." It can measure how infrared light reflects off the vegetation. A stressed plant reflects light differently than a healthy plant. This may help a farmer decide to run the irrigation or figure out what pest is bothering the crop. There are so many variables to what the data can mean, but it gives the farmer a much better idea of where to look for problems or stressors in the field.

Some very skilled pilots and high-end drones can even take leaf samples to bring back to the farm to be sent off to the lab for analysis.

Drones and Livestock – Do they work together?

Drones can certainly be used to work with pastured animals – whether it's to keep track of animals, watch for patterns in the pasture, or to just check on the animals, especially when there are newborns calves, or when it's lambing season.

Drones would be very helpful in pastured situation where farms want to see if the animals need to be switched to a different pasture without the hassle of leaving the farm or disturbing the animals by walking the pasture. Drones are becoming less noisy depending on the model chosen.

There are imaging sensors available to show temperature ranges on animals such as cows that can help farmer determine if the animal is in heat or even sick.

Sounds fantastic, but are there are drawbacks?

As with everything there is a learning curve. Some farms have hired a UAV specialist to do the things described above. This enables them to reap the benefits of this technology without having to invest the time in learning it. Other farms have embraced the technology and someone on the farm is dedicated to working with the drones.

The imagery and data aren't nearly as simple as it sounds above. There's some parsing of the data to make sure it's accurate and often it does mean putting some truth into the images by walking the field.

Drones are expensive as are the sensors, cameras, and software that comes with them. A farm has to consider what payoffs or cost savings can be realized by fully utilizing everything their new purchase has to offer. In other words if you've got it you might as use all of it!

Recently there was a new determination by the FAA that has made using and owning a drone a little easier for agricultural applications. Now, the person flying the drone only needs a Remote Pilot in Command certification, which is new and seems to be a better fit for UAV operators.

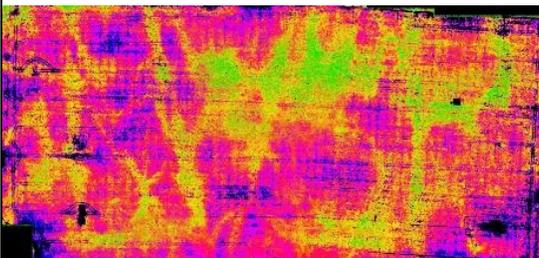
How can I learn more about these fabulous machines?

The Michigan Agriculture Environmental Assurance Program (MAEAP) is holding a field day on August 17 from 5:30-7:30 p.m. on exploring how drones are being used now in farming, and what the future may hold. This field day is made possible through a grant from Missaukee Farm Bureau in conjunction with Missaukee Conservation District, Wexford Conservation District, and the Natural Resource Conservation Service. If you are interested in attending, please contact the Wexford Conservation District at (231) 775-7681, ext. 3 to make a reservation.

Jodi DeHate is the MAEAP technician serving Wexford, Missaukee, Kalkaska, and Crawford counties. She assists farmers and landowners with the stewardship of their natural resources. Jodi can be reached by calling the Missaukee Conservation District at 231-839-7193, or by email at jodi.dehate@macd.org



A quad copter UAV from Thumb Drone Works (Image courtesy of Thumb Drone Works).



Infrared photo from a drone showing tile lines in an Osceola County farm field.



It's easy to see where the tile drainage lines are in this field. This photo captured by a drone enables a farmer to check to see how wet different areas of the field are. (Image courtesy of Thumb Drone Works).



Marlin Venema in a field of his corn in Osceola County. Corn fields in summer are dense and difficult to walk through. Aerial imagery provided by a drone can help a farmer find problems when they are still small and relatively easy to deal with.