Drones in Agriculture

As prices go down for drones, they are becoming more and more widely used for precision agriculture. Precision agriculture pinpoints exactly where the problems are and what to do to help it, such as how green plants are to determine how much fertilizer will need to be put down in different areas of the field. The drones will help farmers see their whole fields instead of seeing just a small part. This will help them make more money as they will be able to find a problem easier this way.

The video, *From Drone To Tractor – How Using A Precision Farming UAV Can Improve Crop Management*, details the process that can be used for precision farming when it comes to fertilizing fields pretty well. First, you fly the drone to get a site analysis of NDVI values. These values let you know where your problem areas are. Before leaving the field you can do a check between what values your drone came up with and what you see in the field to verify. You then load the data into a program on your computer to come up with an application map. Using the NDVI data collected, you can figure where you need to apply varying levels of fertilizer, so each area is getting a more accurate amount based on the data collected. From the data collected from the UAV and input into a program on the computer to detail the amount of fertilizer needed, the data is put into a computer on the tractor and the fertilizer is spread at the amounts put in. You can also use the drones to help figure out things such as seeding rates and soil moisture. (senseFly 2015).

In the video, *Ghana: Drones for precision agriculture*, a farmer in was having problems with a fungus on his pineapples in Ghana, which he wasn't able to identify as well from the ground. They were able to use the NDVI images collected from the drone to identify dark green

and light green fields. This allowed them to discover that where the fields were light green, was where the fungal attack was. Using the drone saved time and money in both finding the cause and the method of getting rid of the fungal attack as the pesticide was able to be applied only to the specific affected areas instead of the whole field. (AgriBusiness TV 2016)

Koppert UAV-IQ has drones that will release beneficial insects onto fields to eat the insects that are damaging crops. This can be done much quicker than having to do it by hand if you have a large area to cover. (Koppert and UAV-IQ 2019)

What drones are out there for precision agriculture? If you have a lot of ground to cover and want to cover it fast, then a fixed-wing drone is probably going to be the best option. According to bestdroneforthejob.com these are some of the fixed-wing drones used for agriculture: The eBee SQ is touted to have all of the tools you need for precision farming and is supposed to be simple to use. The AgDrone by Honeycomb and the Sentera Phoenix2 both also have the hardware, software, and data that you will need for precision farming. The AgEagle RX60 and the Trimble UX5 are two other drones that are supposed to be good as well. (Nixon 2020)

If you have more detailed smaller areas you need to look close in at, then it is probably better to go with a multi-rotor drone. Some of the ones on the agriculture market are the PrecisionHawk Crop Scouting Package, Sentera NDVI Upgrade for DJI Phantom 4 PRO, DJI Smarter Farming Package, and the Sentera Omni Ag. (Nixon 2020).

It appears as though the future of agriculture may begin to incorporate more drones as time goes on and people become more educated on the benefits. I can see the benefit of using drones in certain areas, especially as it becomes more and more difficult to find enough workers to help out on the farm. It will also help make sure farmers can keep their crops as healthy as

possible while saving money because they can pinpoint the problem areas and apply whatever is needed there instead of treating the whole field equally.

Rachael Bingham

References

senseFly. 2015. *From Drone To Tractor – How Using A Precision Farming UAV Can Improve Crop Management.* https://www.youtube.com/watch?v=du7wJX6hEP4

AgriBusiness TV. 2016. Ghana: *Drones for precision agriculture*. https://www.youtube.com/watch?v=DusHg6bhDq0

Koppert and UAV-IQ. 2019.*Drone-based Aerial Biocontrol by Koppert & UAV-IQ* https://youtu.be/uxTV1Qu3X0s

Nixon, Andrew. 2020. https://bestdroneforthejob.com/drone-buying-guides/agriculture-drone-buyers-guide/#:~:text=Ag%20Drone%20Service%20Providers%20%20%20%20Company,%20Hong%20Kong%20%2015%20more%20rows%20