For Immediate Release
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Five Facts You Need to Know About Aerial Application and UAVs

ALEXANDRIA, VA – SEPTEMBER 10, 2019 – Over the last few years, the National Agricultural Aviation Association (NAAA) has consistently needed to set the record straight about inaccurate and/or misleading claims made about how Unmanned Aerial Vehicle (UAV) technology can act as a wholesale replacement to manned aircraft applying crop protection products. NAAA believes UAV application technologies can be a valuable tool for growers by complementing manned aircraft by spraying plots of land not suitable for manned aircraft to treat, or to also contribute in making aerial applications more efficient by joining the manned aircraft and satellite fleet to provide aerial imaging services. Some NAAA members are using and others are exploring the potential use of UAVs themselves for both imaging purposes and to treat very small areas not suitable for applications with manned agricultural aircraft.

It is vital, however, that growers, foresters and others desiring aerial application services know the facts about the capabilities of manned aircraft and UAVs before making financial decisions. Here are five facts regarding the more commonly repeated inaccurate claims about manned aerial application.

1) **Aerial application by manned aircraft is by far the fastest application method**. Every year aerial application pilots treat approximately 127 million acres of cropland in the U.S. This equates to 28% of all commercial cropland in the country. A relatively small number of pilots accomplish this feat by using agricultural aircraft holding between 100 and 800 gallons of product. UAVs do not have payloads approaching anywhere near this size, nor do they achieve speeds even close to the 90 to 150 mph speeds manned ag aircraft travel across a field during an application. The large hopper size and high speed of manned agricultural aircraft make them capable of treating up to 2,000 acres per day per aircraft. A breakdown of the claims and specifications of one UAV touted as being capable of replacing manned agricultural aircraft revealed that it would in fact only be capable of treating 97 acres per day. While UAVs are a popular application method in Japan, average farm size in Japan is approximately 5 acres, compared to 441 acres in the U.S. This is where UAVs can complement manned aircraft nicely,

by making applications on small plots of land that are not suitable for traditional airplanes or helicopters. When it comes to treating large acreages of cropland in timely, economic and efficient fashion to treat a pest outbreak, UAVs are not up to the task at this point.

2) **Manned aircraft are equipped with GPS, variable rate, precision application technology, etc. making them equally technologically sophisticated as UAVs if not more so.** UAVs like to market certain technologies like GPS and electrostatic spray systems as unique to the UAV industry. Each technology available on a UAV has already been in use by manned aerial applicators across the country, in some cases for several decades. Furthermore, manned agricultural aircraft have technologies not seen on many of the UAVs being promoted as able to make pesticide applications. These include onboard weather monitoring, flow control for both liquid and dry applications, in-flight boom length reduction systems for drift mitigation, and pulse width modulation technology that can provide flow, pressure and on/off control to each individual nozzle, markedly enhancing efficiency and accuracy.

3) **Aerial applicators can and do operate at night.** Night operations are conducted with the use of high-performance lighting systems or night vision goggles. Seven percent of aerial application operators conduct applications after dark, treating a total of 1.9 million acres.

4) **There is no evidence UAVs are more efficacious or create less unintentional drift than manned aircraft.** Manned aircraft are generally larger, weigh more and take up more physical space than UAVs. Aerodynamically, this means manned aircraft displace more air, causing the product being applied to go deep into the crop canopy for excellent coverage. Additionally, thanks to extensive research done by the USDA's Aerial Application Technology Research Unit and the EPA, manned aircraft have sophisticated spray nozzle models showing how products applied aerially are dispersed based on aircraft size, aircraft speed, wake vortices, windspeed, temperature, boom length, droplet size and many other factors. However, these models only apply to traditional manned aircraft that are either single-rotor helicopters or single prop airplanes moving at high speeds. The models are not applicable to multi-rotor drones moving much slower and weighing much less. New spray models applicable to unmanned aircraft with two, three, four or even eight rotors need to be developed to show how airflow is affecting the movement of applied materials from a drone before anyone can confidently state the efficaciousness of UAVs. This research has been sparsely conducted on drones, if at all, compared to the nearly 100 years of data that has been accumulated on manned single prop/rotor aircraft. The efficacy and drift aspects are things that pesticide manufacturers, state

regulators and the EPA are concerned about and are looking into as part of their role to ensure occupational and environmental health.

5) **Applications made by UAVs might not be in compliance with EPA policy.** As mentioned in Fact No. 4, the models used by the EPA to calculate aerial drift only apply to traditional manned aircraft. The purpose of running these models is for the EPA to create a legally binding label that details the time, manner and place a pesticide can be used that is applied aerially. Due to legal requirements to conduct the precise and methodical work that goes into developing models to ensure the safe use of these products by air via manned aircraft, similar policy must be followed to develop label language on the proper way to safely apply these products by drone.

   In addition, certain claims have been made by drone manufacturers that raise questions as to whether even current aerial pesticide labels are being followed by them correctly. For example, one UAV manufacturer with a 5.9-gallon capacity tank claimed its drone was capable of covering 37 acres per load. To achieve 37 acres per load with a 5.9-gallon tank, the drone would need to apply at an application rate of 0.16 gallons per acre. No product registered in the U.S. even remotely allows for such a low broadcast application rate, ground or aerial, due to efficacy and off-target movement of product concerns. This same manufacturer described its UAV as capable of creating a uniform droplet size of 20 to 100 microns. It is well established within the pesticide application community that droplets less than 100 microns in diameter are at high risk for drifting off target. This means that entire spray volume from the UAV would likely drift away instead of depositing on the intended target.

NAAA welcomes the use of UAVs in agriculture—whether for application or imaging or other yet-to-be-determined uses—and believes under the right conditions they can be a useful tool for growers to help produce the food, fiber and biofuel needed for our growing world. However, while this technology develops it is vital that it follows established, confirmed procedures that ensure its safe, effective and protective use. It is also important that presently the public knows the capabilities of existing manned aircraft technology, which already treats a significant percentage all cropland in the U.S. in this manner.
