MISSISSIPPI STATE UNIVERSITY EXTENSION

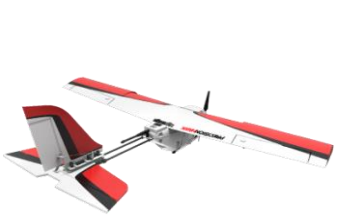
Unmanned Aerial Systems Newsletter

Latest in agricultural UAS activities at MSU

MISSISSIPPI STATE UNIVERSITY EXTENSION SERVICE • DECEMBER 2016

In this second newsletter we will review the components of UAS technology that make up the jigsaw puzzle we talked about in the first newsletter. For most of us, the aircraft—Unmanned Aerial Vehicle (UAV)—is what UAS technology is all about. This is understandable because the aircraft has the "WOW!" factor and it's what people see.

There are two main types of aircraft, **fixed wing and multirotor.** A fixed wing UAV, below left, looks like a traditional airplane. Some aircraft also look like a delta wing, below right.



Multirotors, below, look like strange helicopters. They're usually much easier to fly.

Which aircraft should you choose?

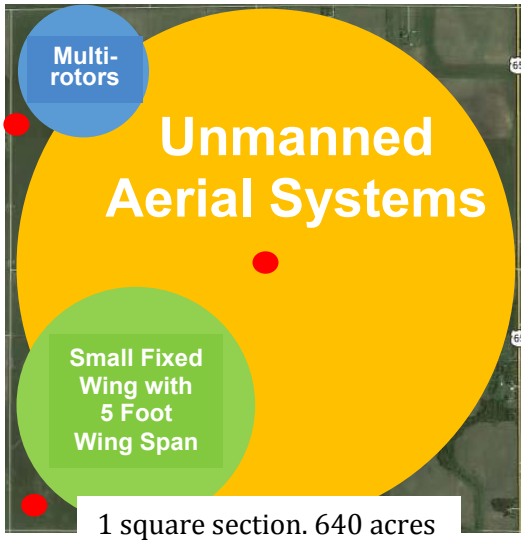
The answer usually comes down to two simple questions: How many acres do I need to fly and how long will the battery last? Battery life will determine how many acres you can fly. This Battery/Flight Time Chart, right, shows a general comparison between the different types of UAVs and the acres they can fly with enough battery life to safely return back to the launch location. The skill level is also listed.

It is highly recommended that you practice with a computer desktop simulator or have someone you know who flies these small aircraft teach you how to properly and safely fly your UAV. You just paid a few hundred to thousands of dollars on your UAV. Don't crash it on the first flight.

PC Remote Control Flight simulator

The average farm size in Mississippi is about 300 acres. This acreage is well suited to scouting with a UAV and can show immediate benefits scouting plant stands, deer and hogs, and wind damage in the field.

UAV Type	Battery/ Flight Time	Skill Level
Multirotor	50-75 acres on 1 battery. About 15-25 minutes.	Lower
Fixed Wing 5-foot or less Wing Span	150–200 acres or less on 1 battery. 25+ minutes.	Higher
Fixed Wing 9-foot or greater Wing Span	Over 1,000 acres on 1 battery. 60–90 minutes.	Higher



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Commercial rules and regulations governing legal flight operations

The Federal Aviation Administration (FAA) released it final rules for small UAS flight operations in the United States airspace. The rules are simply known as Part 107 for small UAS (www.faa.gov/uas). Part 107 can be divided into three main categories:

1. Flight Operations
2. The Aircraft
3. Pilot Certification

Below is a summary of the FAA Part 107 sUAS regulations:

Flight Operations

- Aircraft must remain within Visual Line of sight (VLOS).
- Daylight operations only.
- Maximum speed of 100 mph.
- Maximum altitude of 400 ft above ground level (AGL) or above structure(s).
- Operations **outside** controlled airspace are allowed without permission.
- Operations **in** controlled airspace are allowed with permission.
- Operations from a moving vehicle permitted in sparsely populated areas.
- Preflight inspection required.
- Visual Observer (VO) not required.
- Certain conditions can be waived.

The Aircraft

- Registration required.
- Aircraft marking required.
- Preflight inspection required.
- Suggested maintenance program.
- Airworthiness not required.
- Remote pilot in command required to ensure aircraft is safe for flying.

Pilot Certification

- Must be 16-years-old.
- Earn Remote Pilot Certificate (RPC).
- Certificate requires passing an Aeronautical Knowledge Test.
- Part 61 pilots need to take an online training course.
- Person controlling the aircraft only needs to be supervised by someone with a RPC.