Unmanned Aircraft Use In Agriculture

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Unmanned Aircraft – Terms / Types

sUAS Micro Unmanned Aerial System

Military

Agricultural

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Unmanned Aircraft – Terms / Types

**sUAS** – *small* Unmanned Aerial System

**Military**

![Raven - Small UAV](image1)

**MX-Sight UAV – Small UAV**

MX-Sight UAV used for vegetation stress monitoring project Spain / California

**Agricultural**

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Unmanned Aircraft – Terms / Types

**UAV** – Unmanned Aerial Vehicle

**Military**

Short Range Tactical UAV

![Marine Corps – Pioneer UAV](image2)

**Large Agricultural UAV**

![Arcangel 1 – ADP Uruguay](image3)

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Unmanned Aircraft – Terms / Types

Military

- Shiebel - CamCopter

Agricultural

- Large Agricultural UAV
- Yamaha – RMAX

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The National Airspace

- Largest most complex air traffic system in the world.
- Administered by the Federal Aviation Authority
- 14,000 Air traffic controllers
- 19,000 Airports / Air strips
- Average of 50,000 flights a day

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The National Airspace – Airspace Classes

The FAA

Ways UAVs certified for operation in the NAS

State Entities (Sheriffs Departments, State Universities) – Certificate of Authorization (COA)

Web based application process requiring hundreds of pages of supporting technical documentation. Several hundred have been issued, they are geographically limited, can and are revoked.

Private Commercial Entities – Special Airworthiness Certificate

Paper based application process, single individual at the FAA responsible for entire nation, less than 90 issues in the history of the FAA for UAV use. Very low success rate for applications.
Civilian UAV Use

Can I fly a UAV? – Yes! No! Maybe!

<500 Feet = Non Navigable Airspace

>500 Feet = Navigable Airspace

Property rights?

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Civilian UAV Use - Moving forward

Reduction in cost of technology

Inertia on the part of the FAA

Interest in Civilian application

“Privacy concerns”
Agricultural UAV Applications – Mapping

Satellite Imaging

Benefits

- Large area coverage
- Not affected by air traffic restrictions
- Global

Drawbacks

- Cost
- Slow to Task
- Affected by cloud cover
- Low resolution (63cm)
Aircraft

- Operating Cost
- Slow to task
- Limited Availability

Benefits
- Large area
- High resolution (25cm – 100cm)
- Modular
- Proven Technology

Micro UAV Imaging

- Low cost of operation
- High resolution (4 – 10cm)
- Highly deployable
- Modular (NIR or Visual camera)
UAV Imaging - Resolution

UAV Produced Maps
• 3D rectified & Geo-referenced maps

UAV Produced Maps

• Multispectral imagery maps

UAV Produced Maps

• Crop Vigour / Stress

UAV Produced Maps
**UAV Produced Maps**

- High resolution (3 – 10cm)
- Highly deployable
- Modular (NIR or Visual camera)
- Fixed wing or rotary wing
- Geo Tagged Imagery
- Real time video transmission

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**Agricultural UAV Applications – Scouting**
**Agricultural UAV Applications – Population Counting**

- High resolution
- GPS Imagery
- Automated counting
- Repeatable

**Agricultural UAV Applications – Crop Dusting**

- Mobile
- Low operational cost
- Improved safety
- Highly deployable
- Precision application
- Reduced inputs
- Repeatable

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