Unmanned Aircraft and Ag Aviation: A Cautious Coexistence

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The Importance of Ag Aviation

- 1,350 aerial applications businesses in the US
- 20 percent of all applied crop protection products on commercial farms
- 71 million acres of crop land each year
- Allows rapid treatment of large, remote areas and hard to reach areas
- Conducive to higher crop yields
UAVs in the News

Drones Find Fans Among Farmers, Filmmakers
- The Wall Street Journal 3/10/14

AgEagle Soaring Toward UAS Success
- Precision Ag 2/10/14

Commercial Agriculture Might Be Largest Beneficiary of UAVs
- Springfield News-Leader 3/22/14
Low-Level Safety Hazards

• Difficult to gather safety data given limited legal flight

• Since 2003
  • 9.5 percent of aerial application accidents were the result of collisions with towers
  • 12.2 percent were the result of collisions with wires

• June 2014 Washington Post Article
  • 400 accidents/incidents involving military UAVs
  • Dozens of near-misses between commercial aircraft and illegally operating UAVs

Wind Turbines E of Bloomington
UAV or Model Aircraft?

- The line between a UAV and a model aircraft was murky until recently
  - Model aircraft standards suggested by AC 91-57 *Model Aircraft Operating Standards*

- The 2012 FAA reauthorization, the FAA Modernization and Reform Act (P.L. 112-95), codified the definition of a model aircraft as one “strictly flown for hobby or recreational purposes.” The Act defines UAVs as commercial.
Aerial Application and UAVs

• Booz Allen Study
  – Predicts UAV annual savings of $159 million for aerial application by 2035 and $186 million in crop input savings.

• AUVSI Study
  – $13.6 billion economic impact within the first three years of integration, $82.1 billion between 2015 and 2025

• Several fallacies in the data used
Issues With Study Estimates/Effectiveness of UAVs

- Extrapolated from the use of UAVs in Japan
  - 90 percent of crop protection in Japan is performed by UAVs (4 gallon RMAX helicopter)
  - Only 28 percent of Japanese farmers farm full-time
  - Average farm size in Japan is 1.5 hectares (3.7 acres), compared to 441 acres in the US.

- AUVSI and Booz Allen studies are based on experimental technologies

- Both studies also assume full integration by 2015

- The amount of air pushed down is exactly proportional to the weight of the aircraft that the air is holding up. A 40 pound helicopter does not displace much air.
Safety Concerns

- UAV inability to “Sense and Avoid”
  - GAO: No adequate technology currently exists that would allow UAVs to sense and avoid other traffic

- Security Concerns
  - UAV “spoofing” or hacking

- “Lost Link” concerns
  - Many aircraft have no lost link procedure and continue flying until they hit an obstacle or run out of fuel
NAAA Safety Recommendations

- NAAA is urging the FAA and Congress that UAVs be required to have:
  - ADS-B Out transponders
  - Strobe lights
  - Marking similar to that required for other low-level obstacles (aviation orange and white paint)
  - A minimum operating altitude of 1000 ft. above ground level for UAVs
  - Operation within visual sight of the operator at all times
NAAA Safety Recommendations (continued)

- Pilot training:
  - Commercial pilots license
  - Reoccurring training
  - Class 2 Medical
  - Flight and aircraft log
  - Commercial Pesticide License if treating crops, if used for application

- Operation within visual range of the operator (line-of-sight)

- Aircraft airworthiness
  - Similar to manned aircraft, certified airworthy
Responsibility and Liability

- Insurance currently offered by AIG and Global Aerospace
- Subject to the traditional see-and-avoid principles of manned aviation and near certain unmanned liability in the event of an accident puts UAV operations at great risk presently
- Farmer insurance policies typically only cover between $100,000 and $300,000 in damages, and only in limited circumstances when it comes to aviation
Conclusion

- NAAA urges the FAA to take its time integrating UAVs into the national airspace and urges the agency to follow a comprehensive, well thought out safety-oriented approach.

- UAVs will not be used for spraying anytime soon, but have crop sensing and other non-application capabilities. Manned aircraft, such as ag aircraft are able to conduct crop sensing services too.

- Considerable liability risk for UAV operators and providers.
Questions?