Current UAV’s

- Dumb machines
  - Fly routes really well, but no obstacle avoidance!!!
Keep in Mind These Guys are Also Flying:
Issues with Agricultural Aircraft:

- Flying at very similar altitudes
- Still no alert or avoidance systems
- Many are colored for good visuals from the ground, not the air (black)
- Most UAV’s have a small profile in the air
Two Main Types of UAS Systems and Other Safety Issues:

- **Note the Following:**
  - **Multi-rotors:**
    - Built-in Geo Fence
    - Very hard to see for pilots though!!!
  - **Airplanes:**
    - Most don’t have a built in Geo-fence
    - Many made of styro-foam
Plane hitting UAV:

- [https://youtu.be/_ieyM1JmXJc](https://youtu.be/_ieyM1JmXJc)
Newer Drone Systems:

- DJI Phantom 3 Advance or Professional ($799 - $1,000)
  - High end Wi-Fi transmitter
    - Receives both video and controls UAV functions
    - Rated for 3.1 miles
    - 1.6 miles in testing
    - Full HD quality video
  - Extremely easy-to-fly
  - Stronger Motors (to fight wind)
  - Longer flight times (20 minutes)
  - Multiple software available with good autopilot and mapping functions
  - 15 to 30 acres per battery, but fast and can use multiple batteries
Newer Software (on Tablets):

- Low priced software for automatic flights and mapping with these units:
  - Pix4DMapper App
  - Plans and executes automated flights
  - Works on tablet / download from store
  - Automatically offloads images and sends to Pix4D, and an geo-orthomosaic is returned to tablet
- Low price: $500 per yr.
- Others: Drone Deploy; Litchi, etc.
Field Mapped with UAV Using Converted Consumer Camera To Greenseeker:

- NDVI green UAV
- NDVI red Greenseeker
New FAA Rule:

- Every drone or UAV (including remote control toys – anything over 0.55 lbs) have to be registered with the FAA by Feb 21st, 2016.
  - Under thirteen won’t be able to register
  - Impedes congressional Law with the AMA for recreational remote control hobbies
  - Still has a review and comment period, but will be retro-active law on Feb 21st.
UAV Sprayers:

- **DJI Crop Sprayer:**
  - Carries 22 lbs. of liquid for spraying
  - Cover 7 to 10 acres per hour
  - Microwave ground sensing sensor
  - Auto path
  - Special force air cleaning system
- **$15,000?**
UAV Sprayers:

- Yamaha RMAX
  - Sanctioned for use in the US
  - 10 ft. in length
  - 20 hp engine
  - Carries 61 lbs. of material
  - Setups for liquid or granular
The End

Questions?