

# UAV'S & REMOTE SENSING



# Remote sensing

- An important component of precision agriculture
- Satellite and aerial imaging have not been widely utilized by growers
  - **Cost**
  - **Timeliness**
  - **Resolution**



# WHAT IS A UAV?

- ❖ Flies Autonomously
- ❖ On Demand
- ❖ Flies Under Cloud Cover
- ❖ Battery Powered
- ❖ Remote sensing
- ❖ Higher Resolution
- ❖ Lower cost for data



# COMPONENTS OF A REMOTE SENSING SYSTEM

- **Aerial platform**
- **GPS Camera system- NDVI**
- **Raw Image processing software - NDVI**
- **Image stitching software**

# ADVANTAGES OF UAV REMOTE SENSING

- Costs effective
- Timeliness
- Can fly under clouds
- Greater resolution



# MANY DIFFERENT TYPES OF SMALL UAVS



# Unmanned Aerial Vehicle

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DraganFly X6

<http://www.draganfly.com>



eBee

<http://www.sensefly.com>



MicroDrone MD4-200

<http://www.microdrones.com>



Yamaha

Fixed-wing



Cropcam



Raven



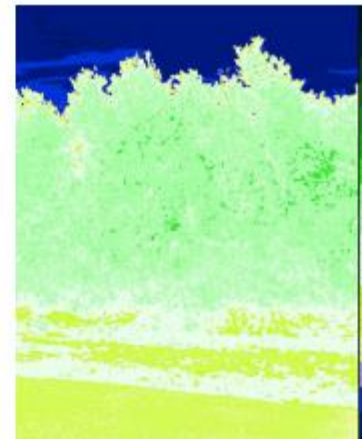
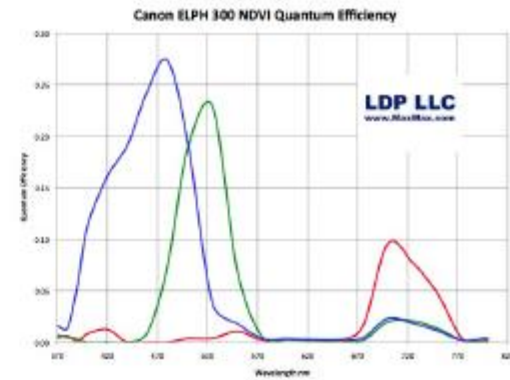
WASP III





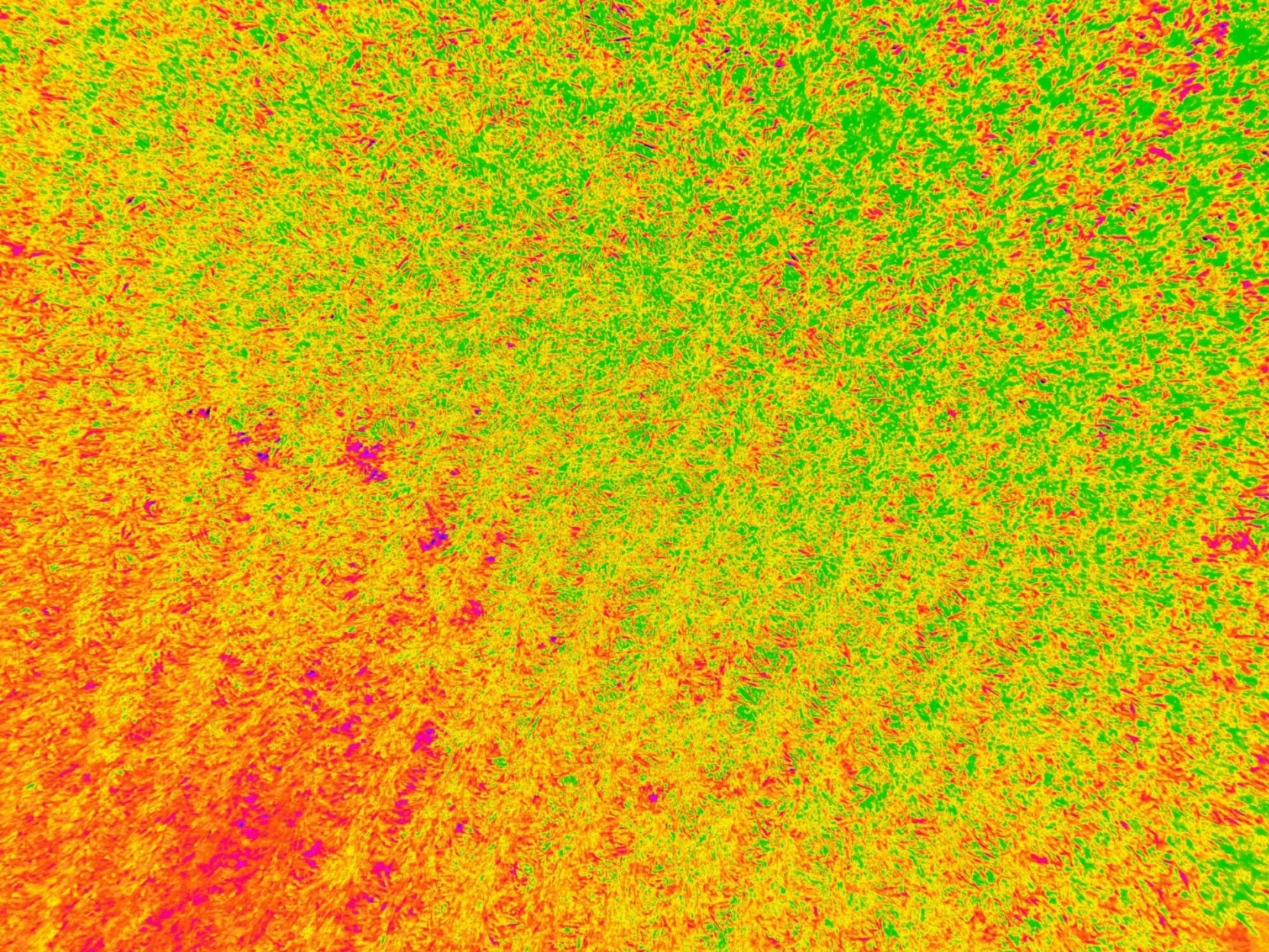
# Imaging Sensors

NDVI Camera





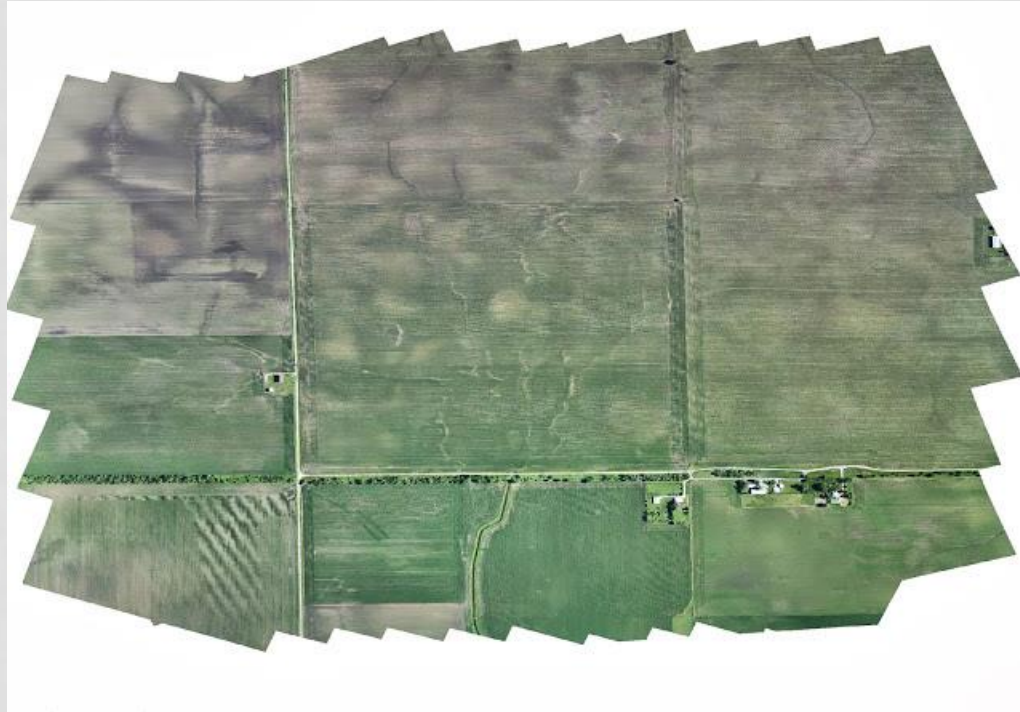
POLADO TEST



POLADO TEST

LO

# STITCHED IMAGING



00:00:00 | 04:29:48



S 0.0 0.0 0.0 0.0 0.0 0.0

25.9

1080 / 30  
WIDE  
SUPER VIEW

71

50

100

78

50

10.69V 37.1A  
2808mAh

95m  
LOS 122m



JENSEN

# POTENTIAL APPLICATIONS

- Monitor crop health
- Bare soil imagery
- Irrigation & drainage planning
- Herbicide injury
- Plant selections for further breeding
- Sample plant pathogens in air
- Check for signs of drought
- Develop crop yield estimates
- Surveillance of research plots
- Efficient application of pesticides



# IN SUMMARY

- ❑ UAV's have great potential for agriculture
- ❑ More research needed to develop proper protocols
- ❑ FAA rules & regulations not clear yet



# MISSION PLANNER SOFTWARE

Mission Planner 1.2.48 mav 1.0

COM3 57600

Flight Data Flight Planner Configuration Simulation Firmware Terminal Help

Distance: 0.4108 km  
Prev: 525.74 m  
Home: 496.17 m

Zoom Action

Waypoints

WP Radius 3 Loiter Radius 3 Default Alt 20  RTL@def Alt  Verify Height Add Below

	Command	Del	Hit Dist	Yav Arr	Lat	Long	Alt	Delete	Up	Down
1	TAKEOFF	0	0	0	29.9602143	-91.7144036	20	X	⬆	⬇
2	WAYPOL...	0	0	0	29.9599355	-91.7146397	20	X	⬆	⬇
3	DO_DIGL...	0	0	0	29.9597031	-91.7148850	20	X	⬆	⬇
4	WAYPOL...	0	0	0	29.9594707	-91.7150581	20	X	⬆	⬇
5	DO_DIGL...	0	0	0	29.9592476	-91.7153156	20	X	⬆	⬇
6	WAYPOL...	0	0	0	29.9591175	-91.7154551	20	X	⬆	⬇
7	WAYPOL...	0	0	0	29.9604746	-91.7140710	20	X	⬆	⬇
8	LAND	0	0	0	29.9604374	-91.7140818	20	X	⬆	⬇

Mouse Location  
Lat 29.959168991  
Long -91.719499826  
Alt 10  
BingSatellite  
Status: loaded tiles  
Read WPs  
Write WPs  
Home Location  
Lat 29.9603723626  
Long -91.714382171  
Alt (abs) 0

2:30 PM



# DRAINAGE





# UAV TEAM

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- ❑ Dr. Randy Price
- ❑ Dr. Brenda Tubana
- ❑ Dr. Rich Johnson
- ❑ Jimmy Flanagan



# QUESTIONS?

