


UAS / Imagery Use in Agriculture Production

John Fulton

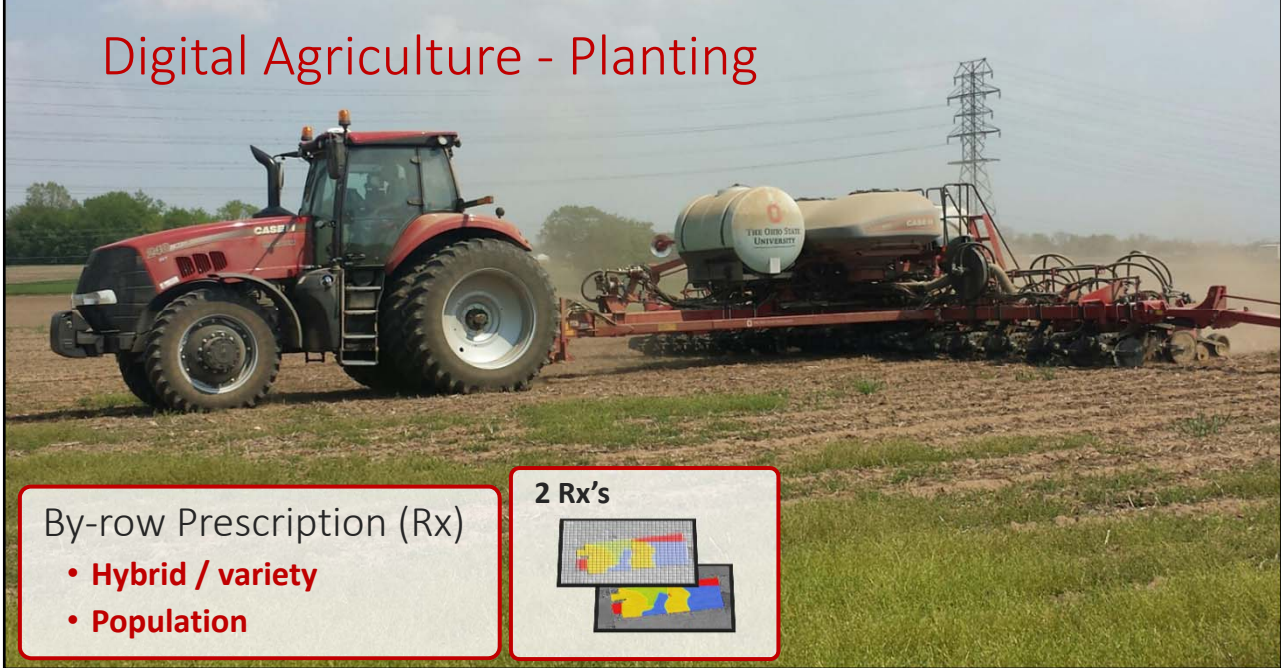




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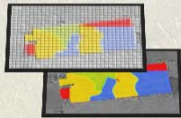
Digital Agriculture - Planting



By-row Prescription (Rx)

- Hybrid / variety
- Population

2 Rx's



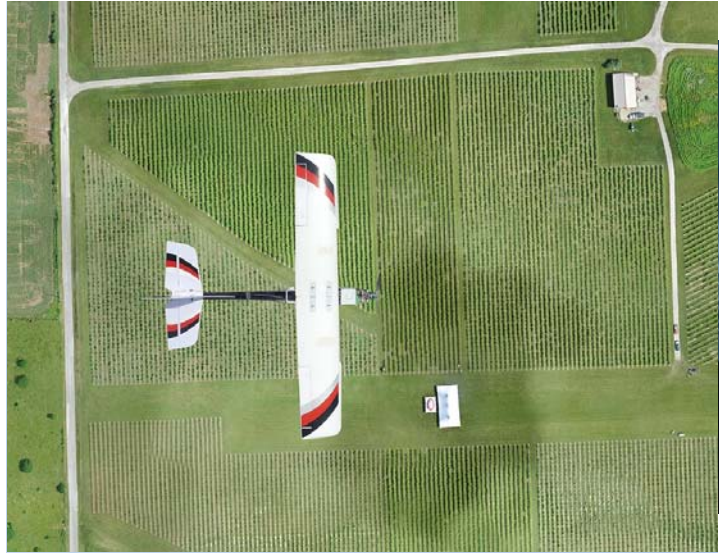




3

Emerging UAV Applications

- **Agriculture**
- Archeology
- Delivery Services
- Emergency Management
- Inspections
- Law Enforcement
- Mapping
- Meteorology
- Photography
- Search & Rescue
- Wildlife Monitoring



COMMERCIALLY AVAILABLE UAVS





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Most popular drone on the market?



Image courtesy of DJI: www.dji.com






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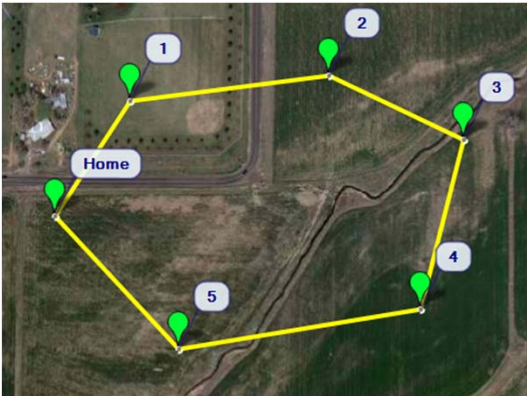
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Flight Planning

Area coverage plan (fixed-wing)



Point-to-point plan (rotor)





UAVs with Larger Payloads - DJI s1000

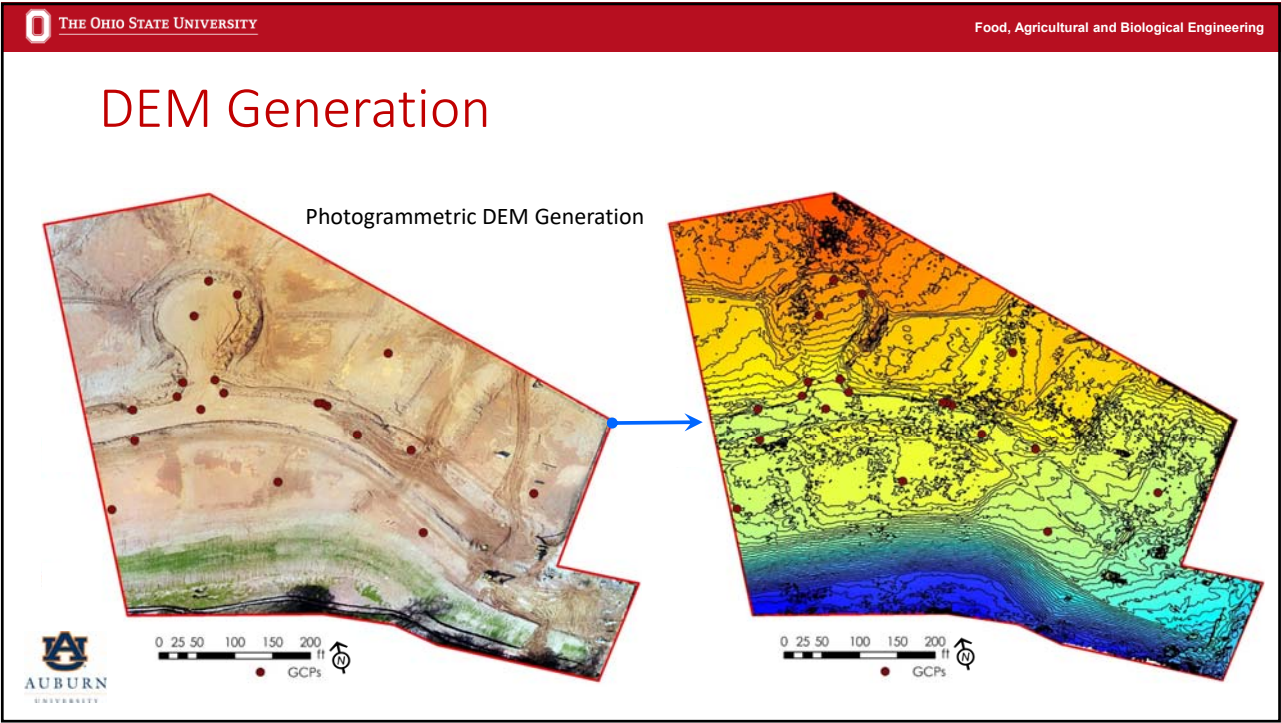
15-lb. payload



www.dji.com/spreading-wings-s1000/spec



Example Applications: Agriculture



Trending in US



<https://youtu.be/P2YPG8PO9JU>





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Drone Spraying (Asia)

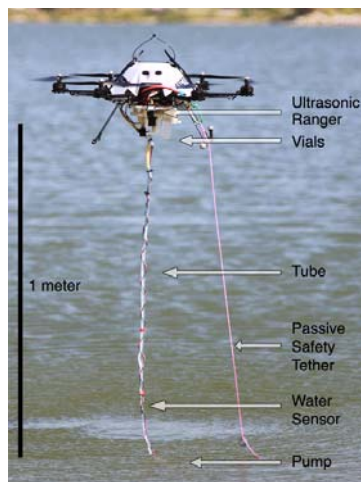


Testing in California vineyards the past 3 years. Continued developed for both fixed-wing and rotors.





Water Sampling with Multi-rotors

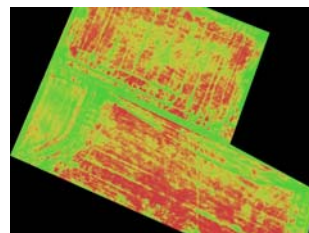
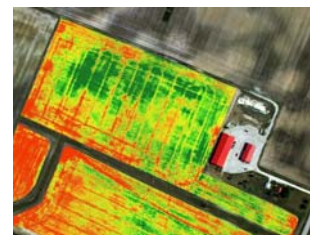



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<http://nimbus.unl.edu/>

Remote Sensed Imagery

- Types of Imagery
 - RGB (Visible)
 - IR (Infrared)
 - NDVI
 - Thermal
- Collecting multiple images per year needed for in-season decisions and creating recommendations...
- Accessibility of data...

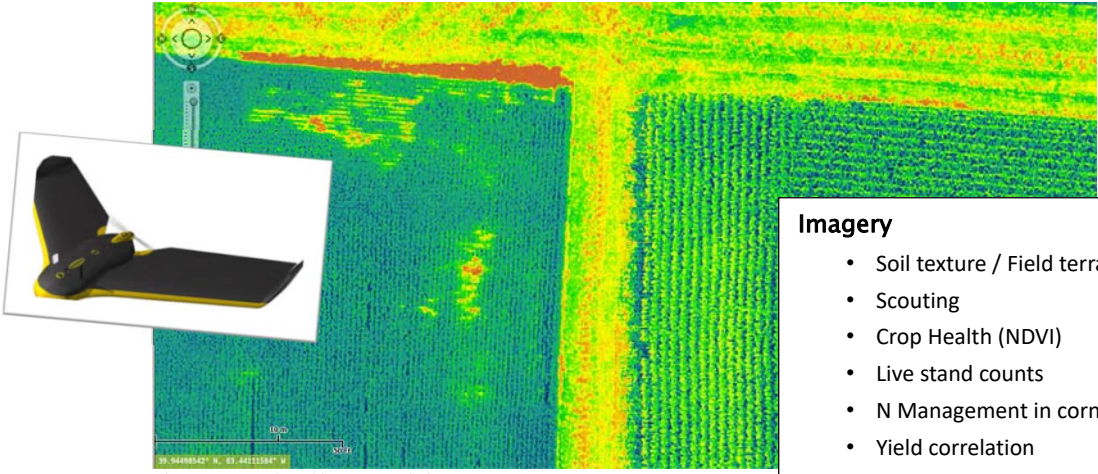




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UAS Delivered Imagery



Imagery

- Soil texture / Field terrain
- Scouting
- Crop Health (NDVI)
- Live stand counts
- N Management in corn
- Yield correlation
- Equipment / management issues
- More...



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Ohio State University, Woolpert and the Air Force Research Laboratory.

About perspective...

Washout

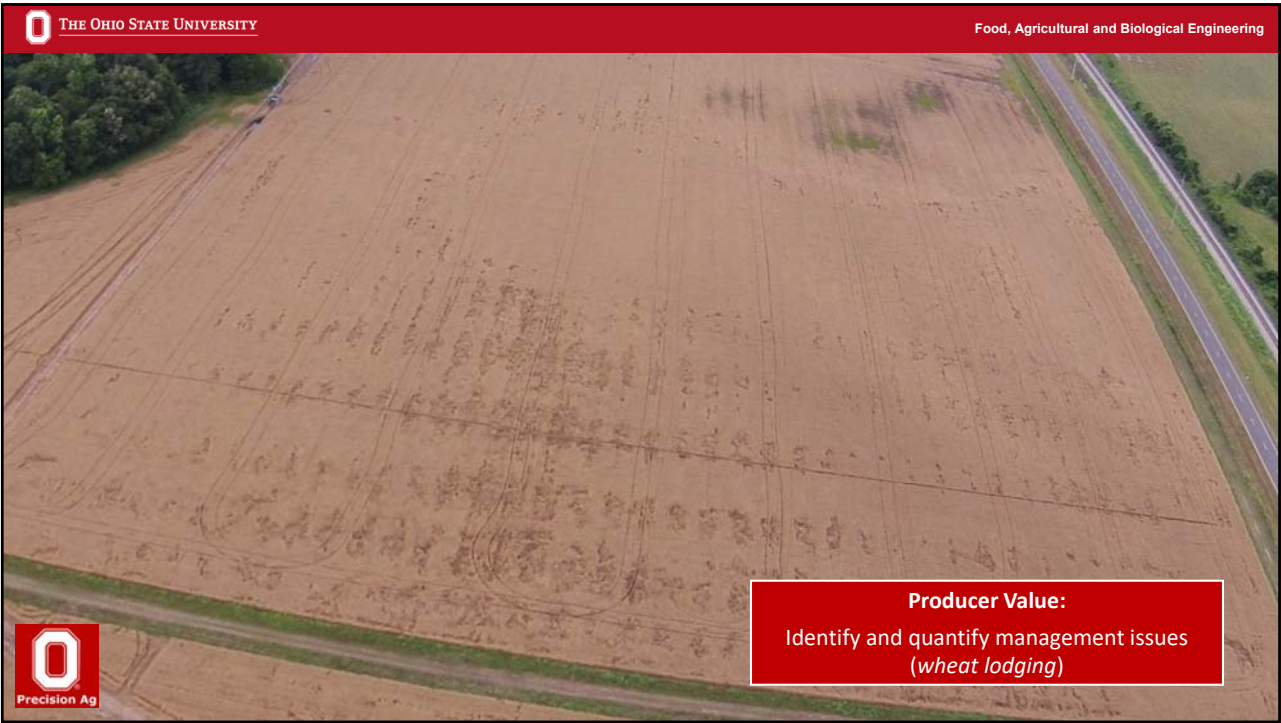
Nitrogen Stress

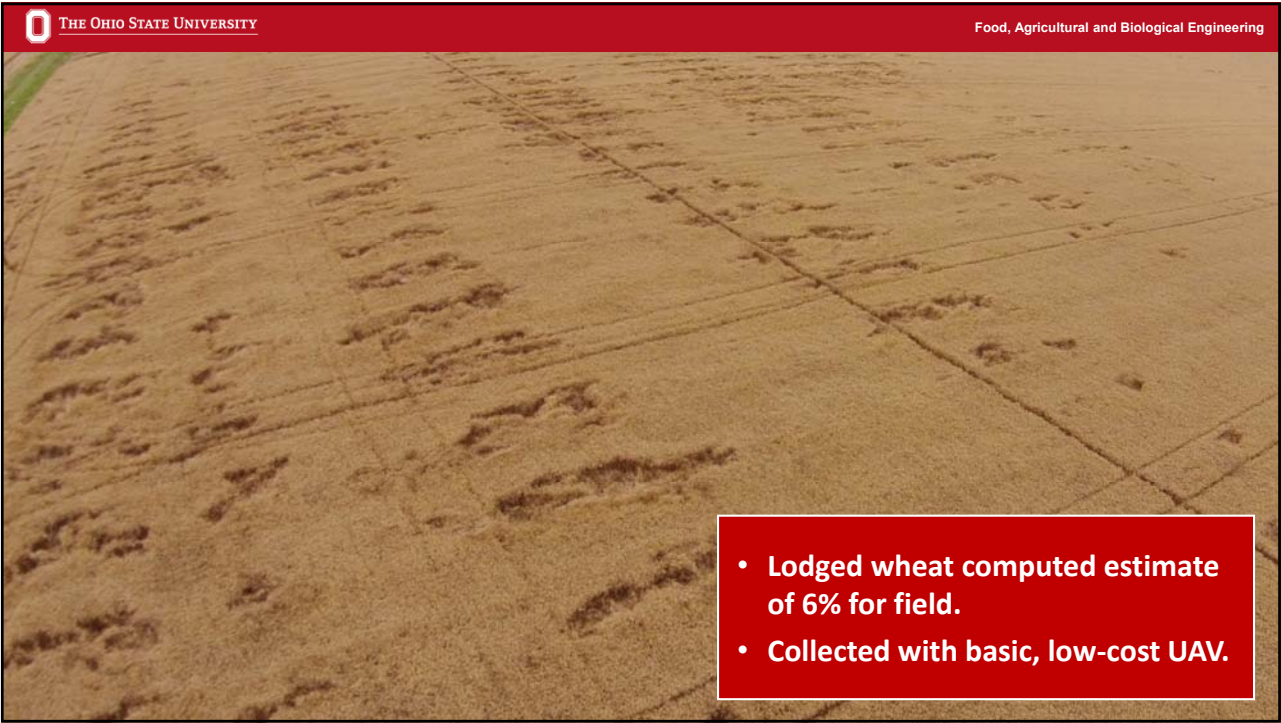
Washout

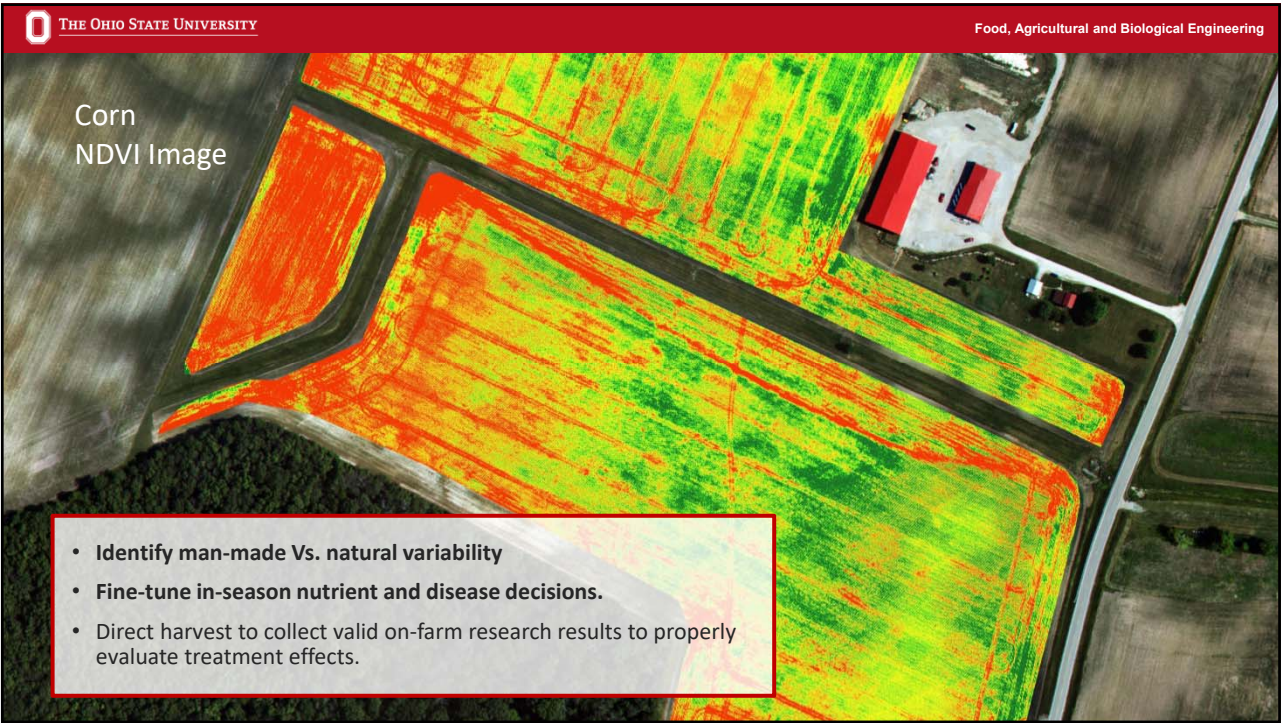
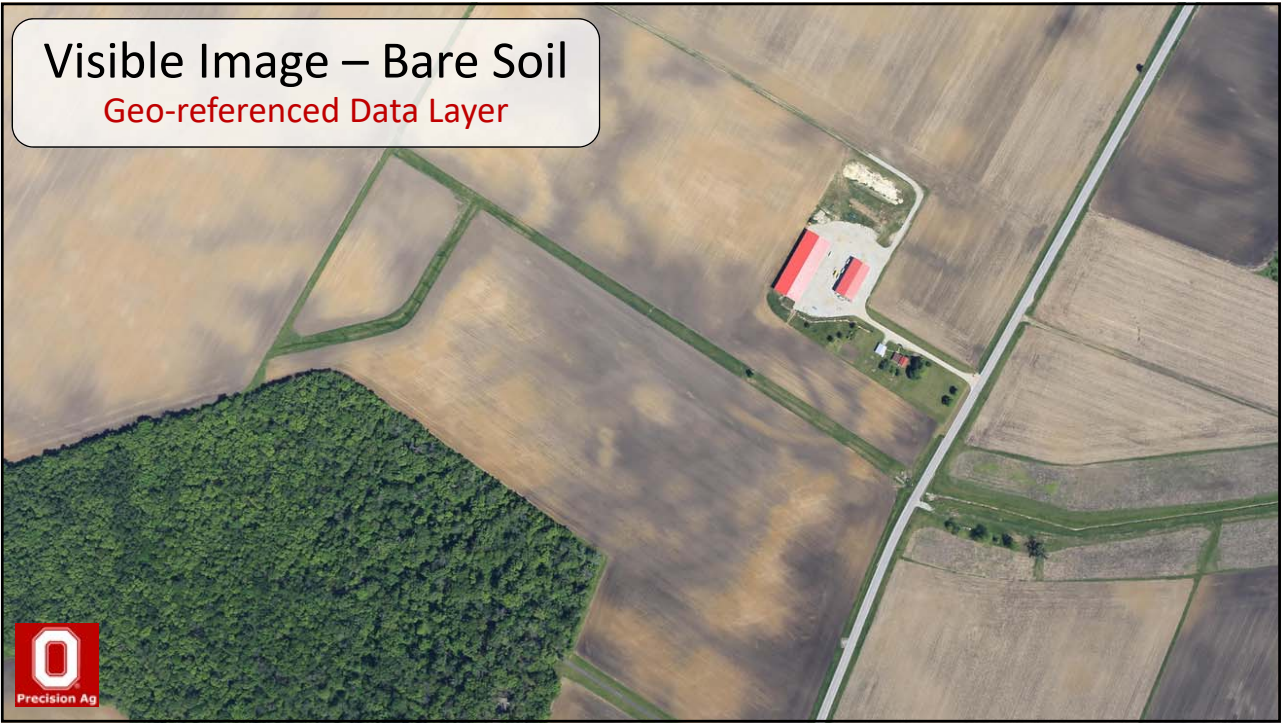


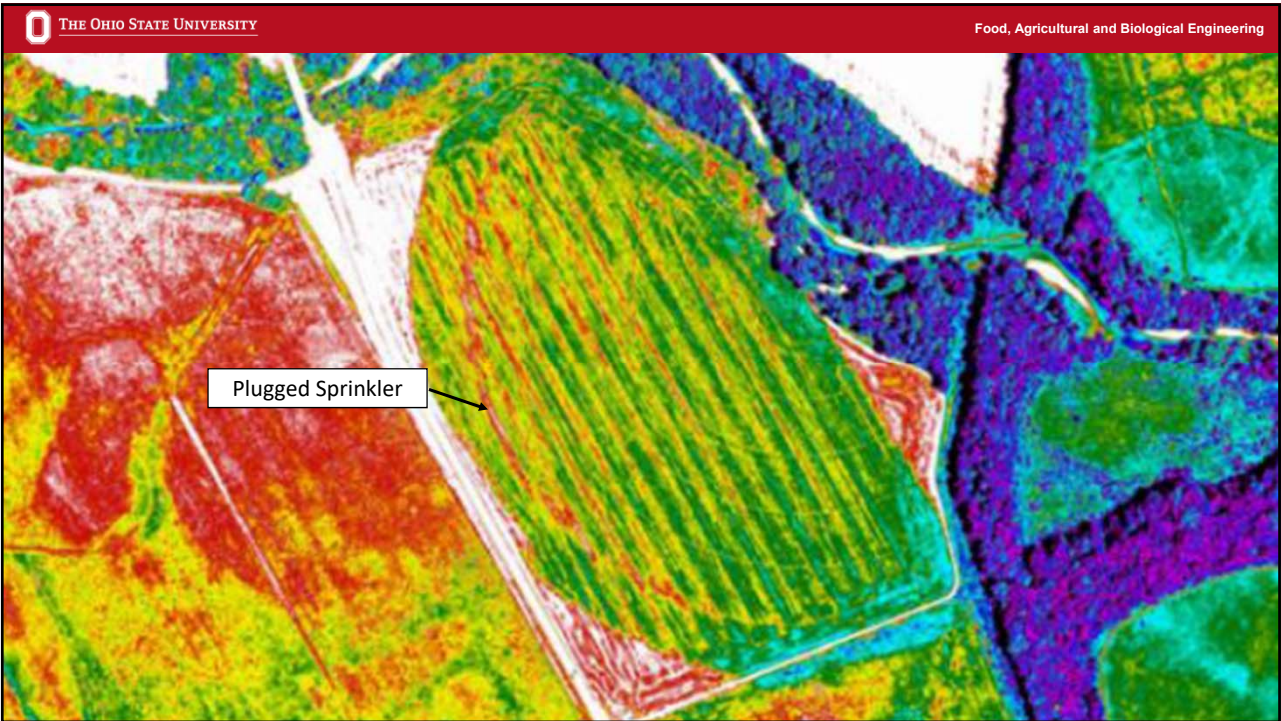
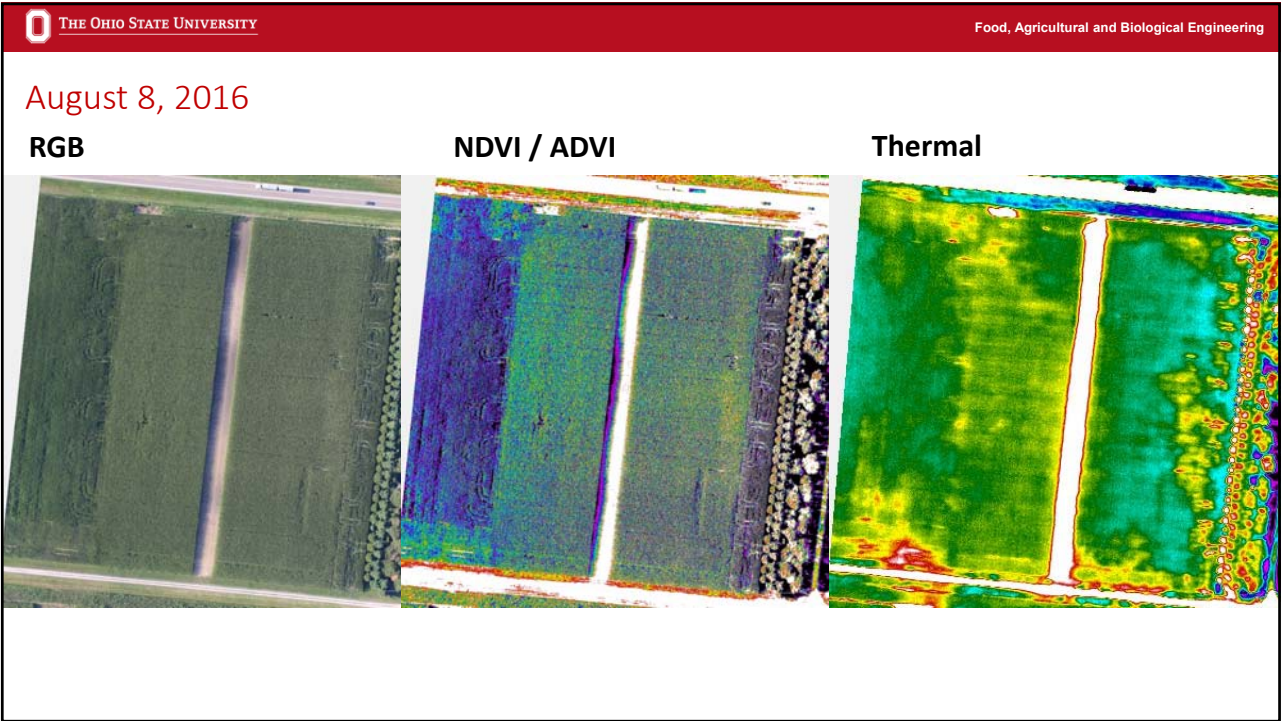
Producer Value

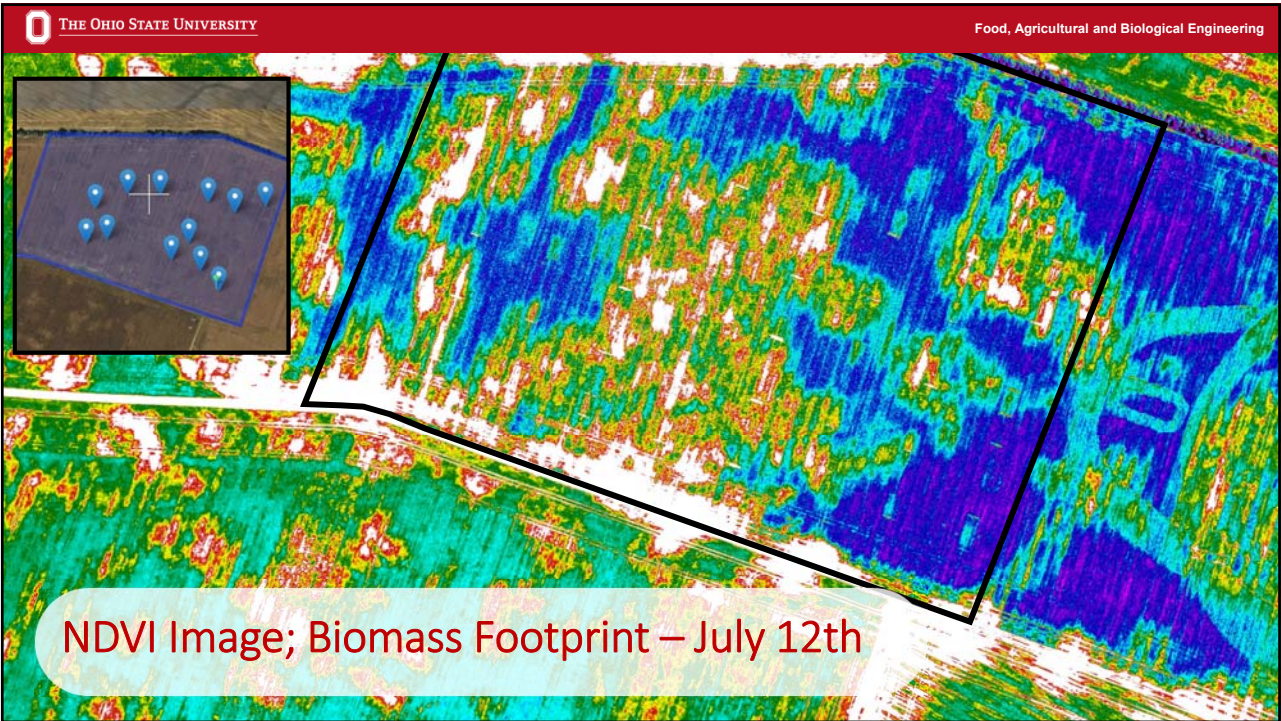
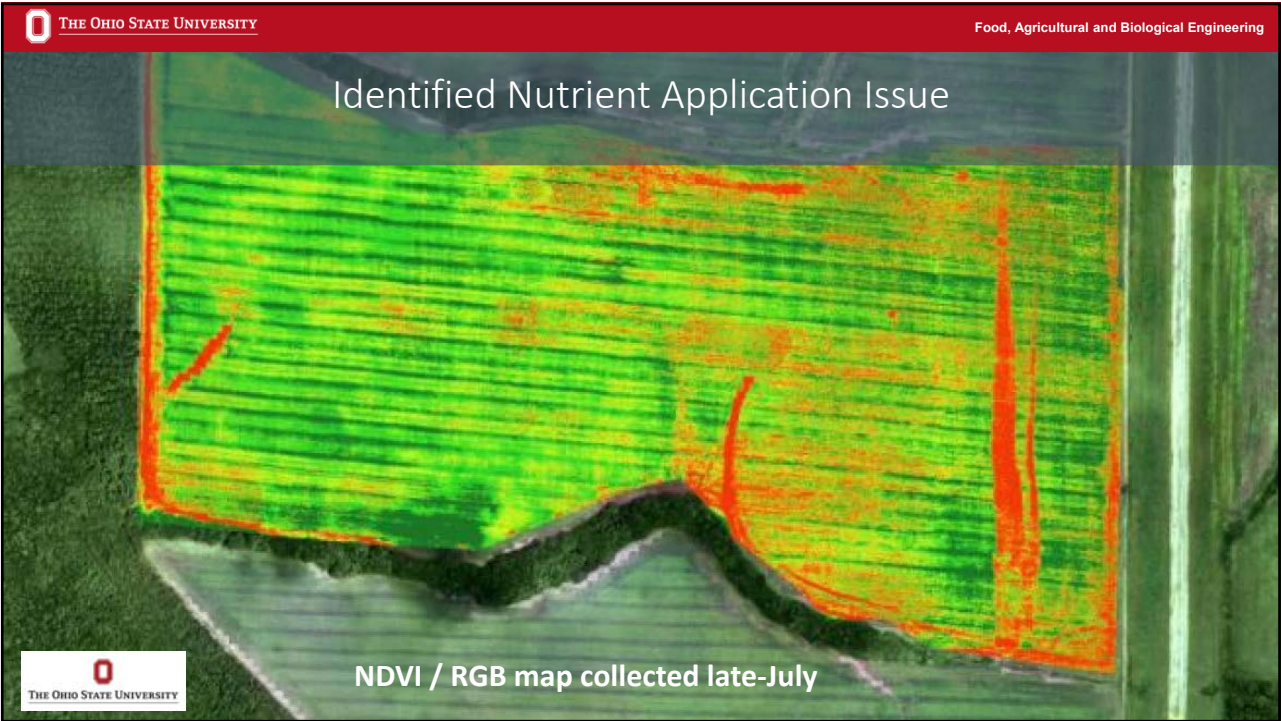
Identify and quantify equipment / management issues














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Field Execution

RX

High Clearance

Placement


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Digital Agriculture
Providing solutions to meet world demand

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**Precision Ag**