Precision Manure Management

Dr. John Fulton

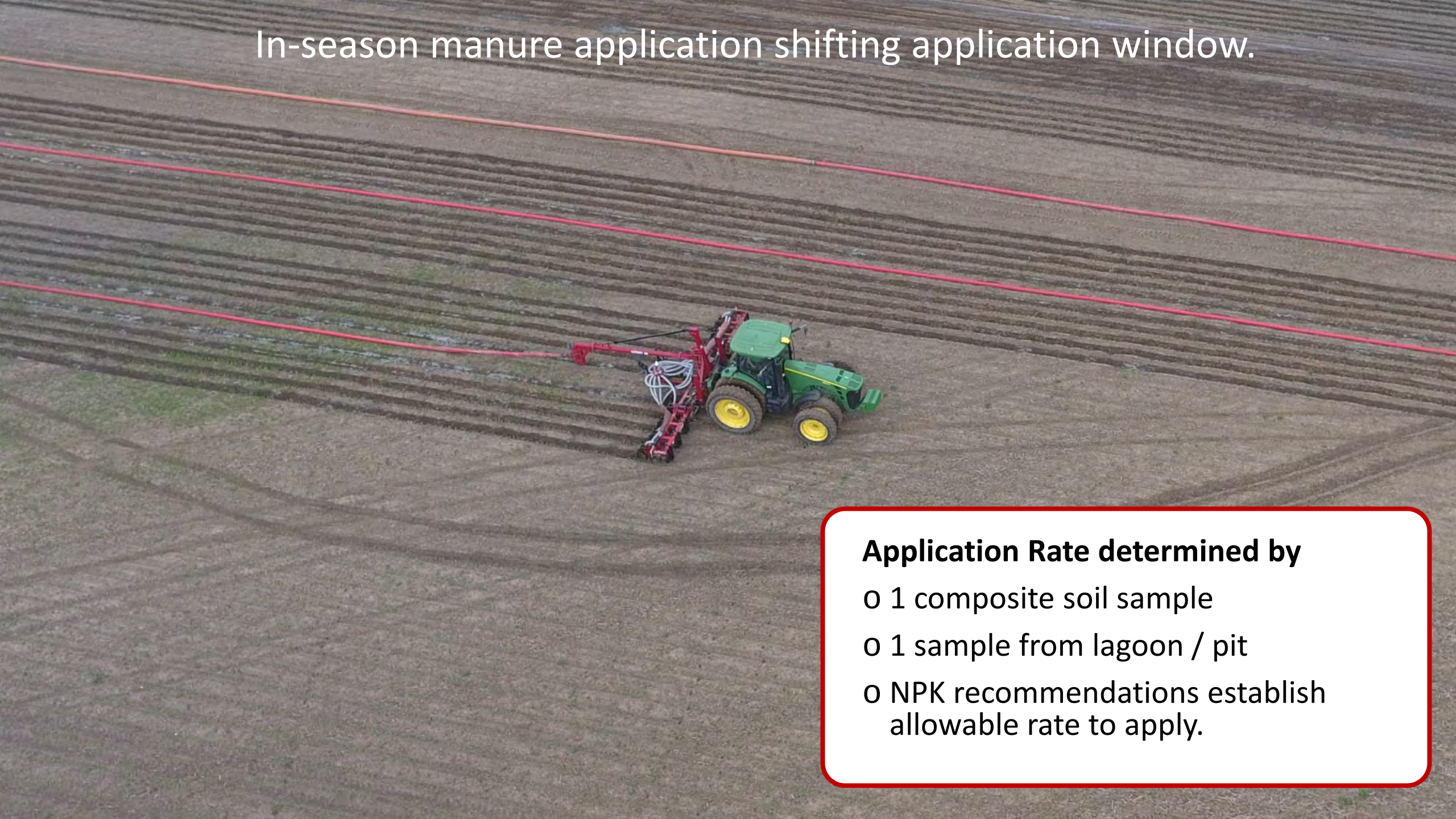
Liquid Manure Bar

- Fall-Spring application common.
- Nutrient management plan
- Environmental risks

** In Ohio, frequency and intensity of heavy rains in the spring (e.g. 5 reduced operating days in April)

How can precision ag technology help?

In-season manure application shifting application window.



Application Rate determined by

- 1 composite soil sample
- 1 sample from lagoon / pit
- NPK recommendations establish allowable rate to apply.


8345R

Practices

- Injection
- In-season
- No inorganic fertilizer

Ag Technology in Use

- Autoguidance (RTK)
- Flow meter (*gallons/ac*)
- Coverage Map

Information Technology

Nutrient Sensors and Automation

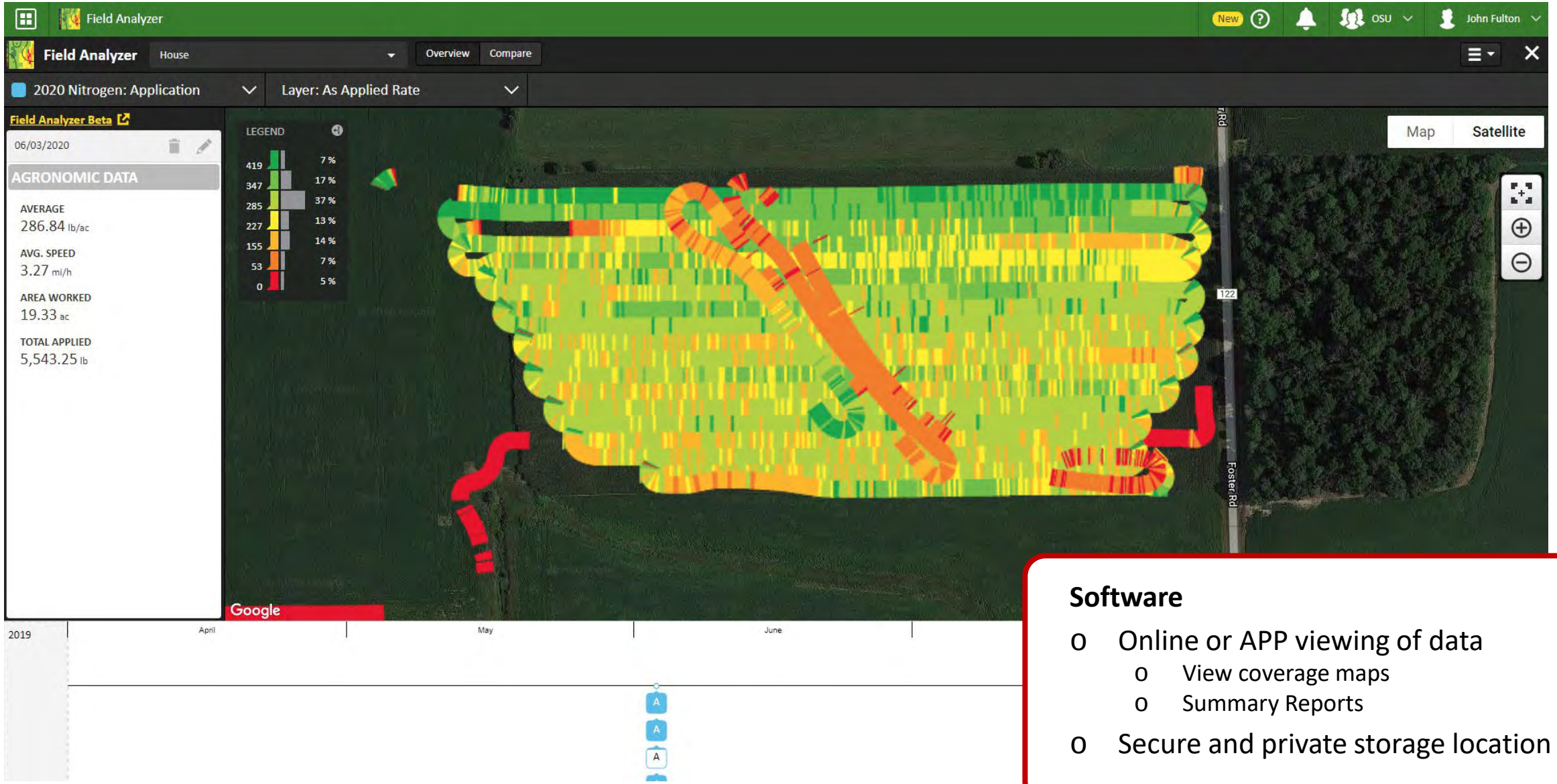
Real-time Nutrient Sensor

- **N**
- **NH_4**
- **P**
- **K**
- **DM**
- ***Flow Rate***

Tractor Implement Automation (TIA)

Once connected through TIA, the sensor provides feedback to adjust tractor ground speed.

1. Ground speed adjustments ensures recommended nutrient concentration applied at the same level across a field, OR
2. Ground speed adjustments enables variable-rate application of manure.



Software

- Online or APP viewing of data
  - View coverage maps
  - Summary Reports
- Secure and private storage location

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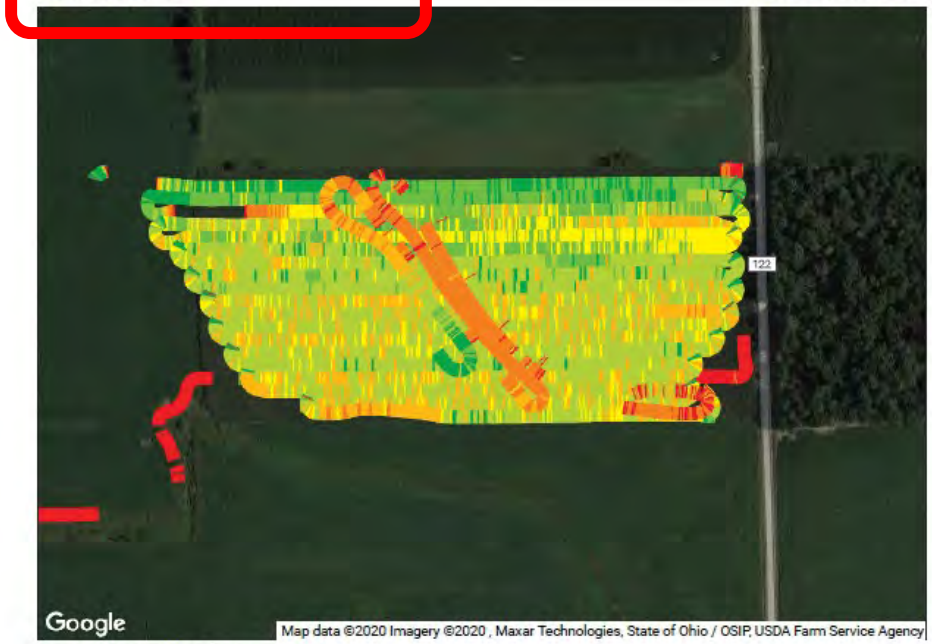
2020 Phosphorous: Application

Layer: As Applied Rate

House

Bohman | 2020 SR 66



Operation Dates: 06/03/2020 - 06/03/2020

AGRONOMIC DATA	
AVERAGE	217.26 lb/ac
AVG. SPEED	3.27 mi/h
AREA WORKED	19.33 ac
TOTAL APPLIED	4,198.64 lb

LEGEND

328	7 %
269	14 %
217	41 %
173	12 %
121	14 %
36	7 %
0	5 %

9/24/2020 Field Analyzer - Operations Center

JOHN DEERE Operations Center

2020 Nitrogen: Application

Layer: As Applied Rate

House

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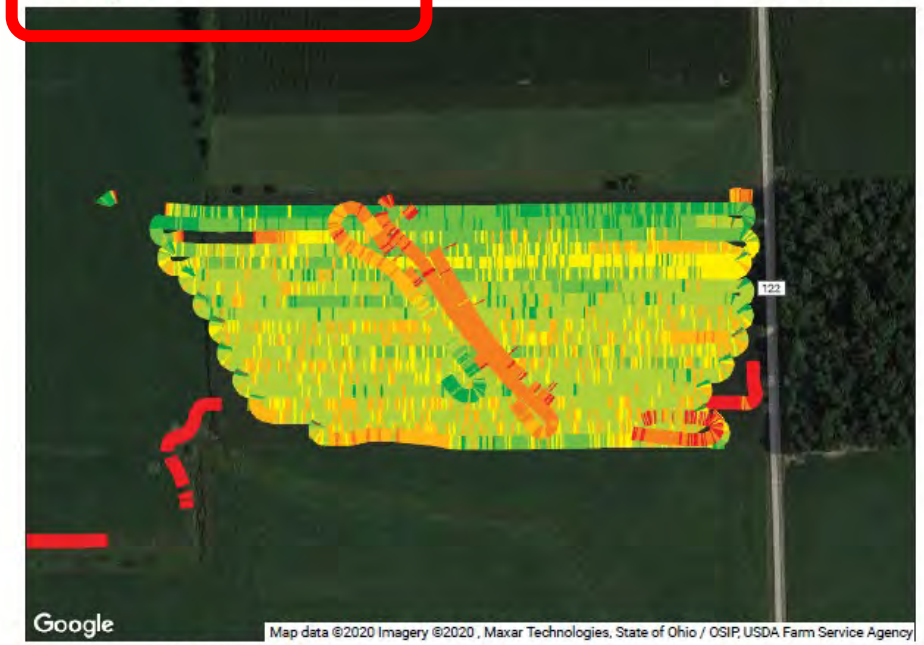

Operation Dates: 06/03/2020 - 06/03/2020

AGRONOMIC DATA	
AVERAGE	286.84 lb/ac
AVG. SPEED	3.27 mi/h
AREA WORKED	19.33 ac
TOTAL APPLIED	5,543.25 lb

LEGEND

419	7 %
347	17 %
285	37 %
227	13 %
155	14 %
53	7 %
0	5 %

Accurate Summary of Manure Application (N)

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Application By Work

Nitrogen | — | Stucke, —

2020

WORK	AREA	AVG RATE	TOTAL	LAST DATE	SPEED
Nitrogen	159.7 ac	404.1 lb/ac	64,549 lb	6/8/20	3.7 mi/hr
TOTALS/AVG	**159.7 ac**	**404.1 lb/ac**	**64,549 lb**	**6/8/20**	**3.7 mi/hr**

Benefits of Precision Ag Technology

1. Reduced operator responsibility
2. More informed application
3. Accurate field records + coverage maps
4. Increase field efficiency (less time in field)
5. Improved yields through proper placement of manure and correct nutrition for crops.
6. Reduced environmental risks (less fuel + proper manure placement in field)

Precision Ag

Autonomous Technology

Autonomy

https://www.youtube.com/watch?v=vVRkqx4khnA

Today’s Applicator

VERSUS

Near-future Autonomous Option
(Raven DOT)

eFields
connecting science to fields

eFields represents an Ohio State University program dedicated to advancing production agriculture through the use of field-scale research.

https://digitalag.osu.edu/efields

Digital Agriculture

Providing solutions to meet world demand

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