Utilization of John Deere's Cotton HID System to Aid Production Decisions

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Harvest Identification (HID) & Cotton Pro

- Commercially available in 2012
- Current standard factory option on the 770 model cotton harvesters
  - Originally an option for the 7760 & 690 models

- The HID system comes with several features:
  - Utilizes embedded RFID tags in cotton plastic wrapping
  - On-board module weighing system
  - Moisture sensor inside the accumulator

Why should we begin to care about fiber quality?

Yield does pay the bills, but why not optimize the amount of money you are making.

Should field performance be measured by only what the yield monitor says?

With a procedure developed, we are beginning to show fiber quality can be traced and used as a field performance metric.

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Materials

- Trimble Nomad
- Trimble RFID Nomad attachment
- MyJD account linked with grower's accounts
- Module scale
- Android tablet with the "RFID Cotton Module Scan" application downloaded
- UGA Extension Enterprise Budget

Study Locations

Colquitt, GA – Cloverleaf Gin

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Methods

- Machines were calibrated to ensure accurate yield data

- Modules produced were labeled and scanned using RFID reader and Module Scan Application
- Matched module label with each gin's individual labeling system

Methods

- After quality data were received, the bale quality grades were averaged from each module using a python program

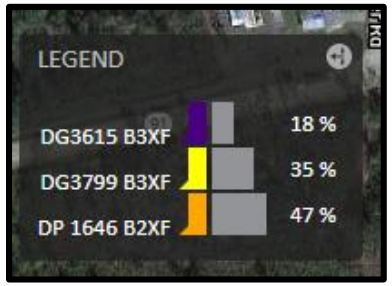
- Using module wrapping timestamp and travel path of the machine, the harvested area can be estimated and recorded
  - example (fid: 0-1991)

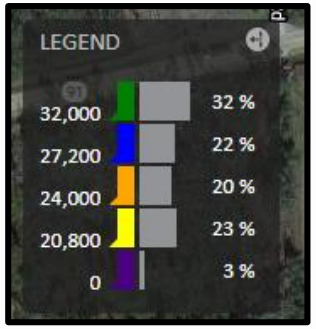
- Fiber quality data were assigned to each of the points and imported/joined in ArcGIS

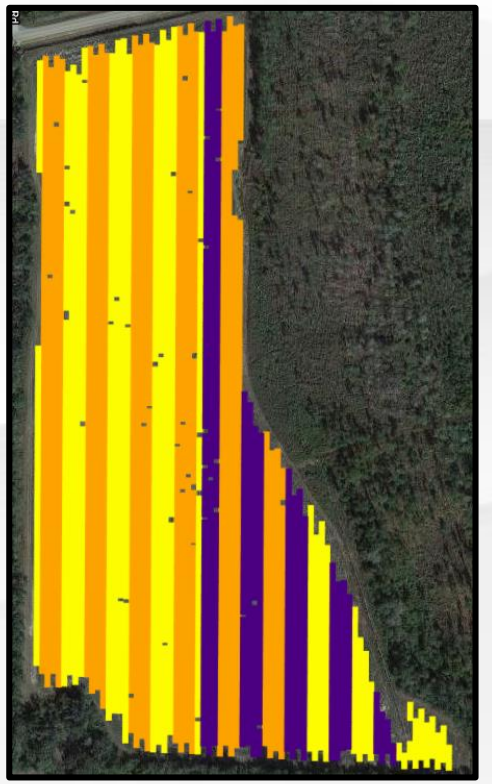
	A	B	C	D	E	F	G	H	I
1	FID	DISTANCE	VRYIELDB/	Time	Heading	Elevation	IsoTime		
2	0	0.049268	0	11/23/20	46.57812	164.1541	2020-11-23T16:32:21.800Z		
3	1	0.41016	2.38	11/23/20	47.04812	164.1869	2020-11-23T16:32:22.803Z		
4	2	1.755304	0.23	11/23/20	50.47812	164.1509	2020-11-23T16:32:23.797Z		
5	3	2.805173	0.05	11/23/20	55.69812	164.2132	2020-11-23T16:32:24.800Z		
6	4	2.805173	0.53	11/23/20	59.39812	164.2526	2020-11-23T16:32:25.802Z		
7	5	3.855042	0.1	11/23/20	63.81812	164.2624	2020-11-23T16:32:26.795Z		
8	6	6.512522	0.08	11/23/20	179.1181	160.9652	2020-11-23T16:34:06.800Z		
9	7	6.479714	0.22	11/23/20	179.6281	160.7913	2020-11-23T16:34:07.789Z		
10	8	6.578139	0.4	11/23/20	179.9281	160.9061	2020-11-23T16:34:08.791Z		
11	9	6.578139	0.49	11/23/20	181.3181	160.952	2020-11-23T16:34:09.794Z		
12	10	6.479714	0.49	11/23/20	180.9781	161.1718	2020-11-23T16:34:10.799Z		

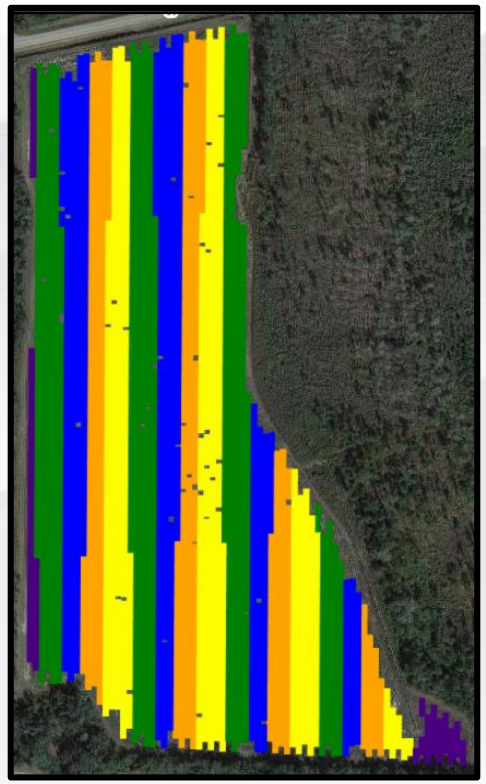
Methods

- Using the exported planting operation file, planting data can be shown
- This data can be spatially joined with the harvest operation file
  - Allows for a georeferenced points to have both operation's attributes









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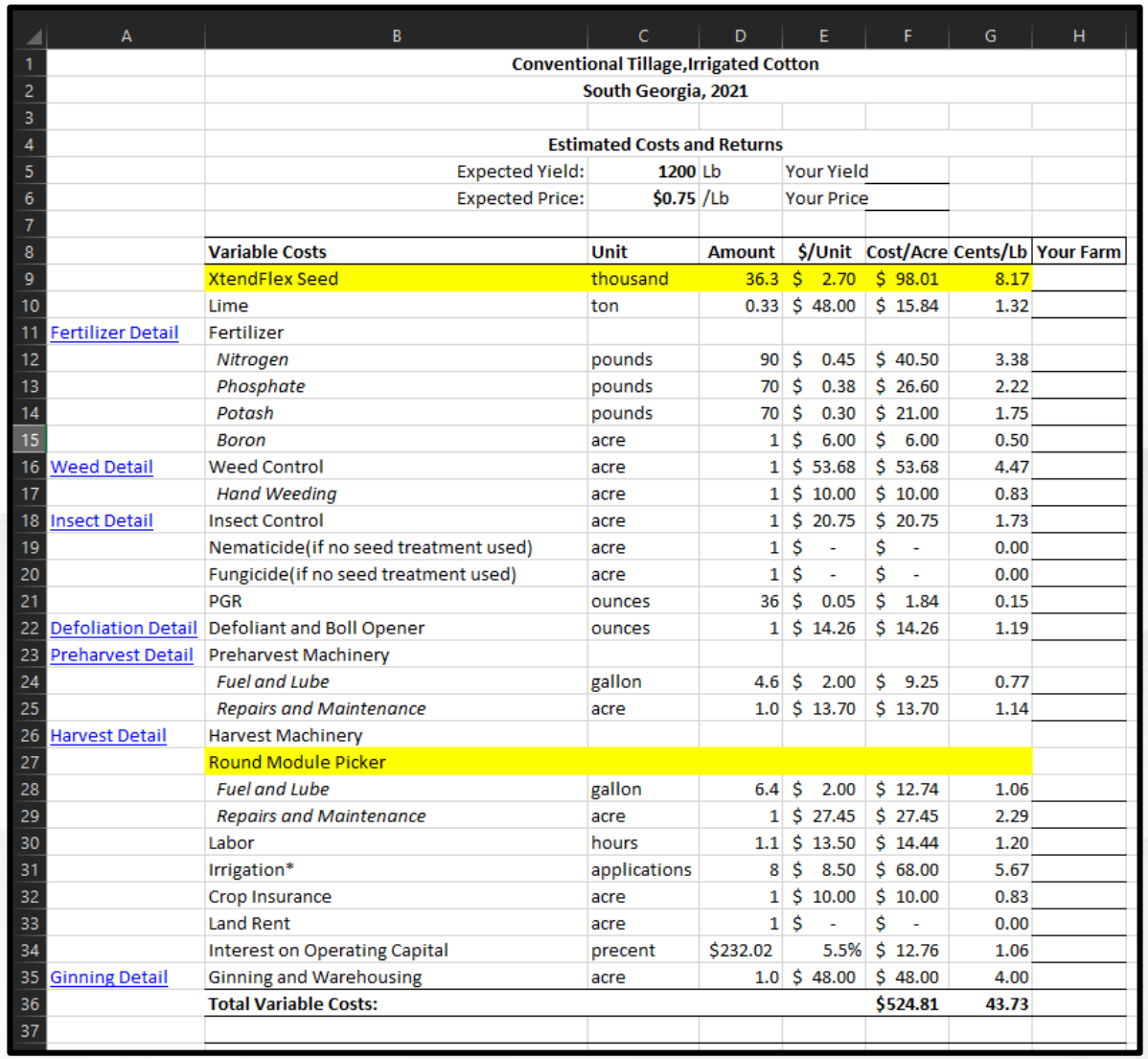
Methods

- Knowing the area that each module represents in a field, the average seeding rate, variety used, average yield level, and fiber quality can allow for an economic understanding

- Using the UGA Enterprise Budget, which provides a basic estimate cost for cotton production, allows for the input of the grower's actual data

  - Net profit was obtained for each module, and showed true profitability of the different treatments



1		Conventional Tillage,Irrigated Cotton						
2		South Georgia, 2021						
3								
4		Estimated Costs and Returns						
5		Expected Yield:	1200	Lb	Your Yield			
6		Expected Price:	$0.75	/Lb	Your Price			
7								
8		**Variable Costs**	**Unit**	**Amount**	**$/Unit**	**Cost/Acre**	**Cents/Lb**	**Your Farm**
9		XtendFlex Seed	thousand	36.3	$ 2.70	$ 98.01	8.17	
10		Lime	ton	0.33	$ 48.00	$ 15.84	1.32	
11	Fertilizer Detail	Fertilizer						
12		*Nitrogen*	pounds	90	$ 0.45	$ 40.50	3.38	
13		*Phosphate*	pounds	70	$ 0.38	$ 26.60	2.22	
14		*Potash*	pounds	70	$ 0.30	$ 21.00	1.75	
15		*Boron*	acre	1	$ 6.00	$ 6.00	0.50	
16	Weed Detail	Weed Control	acre	1	$ 53.68	$ 53.68	4.47	
17		*Hand Weeding*	acre	1	$ 10.00	$ 10.00	0.83	
18	Insect Detail	Insect Control	acre	1	$ 20.75	$ 20.75	1.73	
19		Nematicide(if no seed treatment used)	acre	1	$ -	$ -	0.00	
20		Fungicide(if no seed treatment used)	acre	1	$ -	$ -	0.00	
21		PGR	ounces	36	$ 0.05	$ 1.84	0.15	
22	Defoliation Detail	Defoliant and Boll Opener	ounces	1	$ 14.26	$ 14.26	1.19	
23	Preharvest Detail	Preharvest Machinery						
24		*Fuel and Lube*	gallon	4.6	$ 2.00	$ 9.25	0.77	
25		*Repairs and Maintenance*	acre	1.0	$ 13.70	$ 13.70	1.14	
26	Harvest Detail	Harvest Machinery						
27		Round Module Picker						
28		*Fuel and Lube*	gallon	6.4	$ 2.00	$ 12.74	1.06	
29		*Repairs and Maintenance*	acre	1	$ 27.45	$ 27.45	2.29	
30		Labor	hours	1.1	$ 13.50	$ 14.44	1.20	
31		Irrigation*	applications	8	$ 8.50	$ 68.00	5.67	
32		Crop Insurance	acre	1	$ 10.00	$ 10.00	0.83	
33		Land Rent	acre	1	$ -	$ -	0.00	
34		Interest on Operating Capital	precent	$232.02	5.5%	$ 12.76	1.06	
35	Ginning Detail	Ginning and Warehousing	acre	1.0	$ 48.00	$ 48.00	4.00	
36		**Total Variable Costs:**				**$524.81**	**43.73**	
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2021 Irrigated Cotton Enterprise Budget

Developed by UGA Extension

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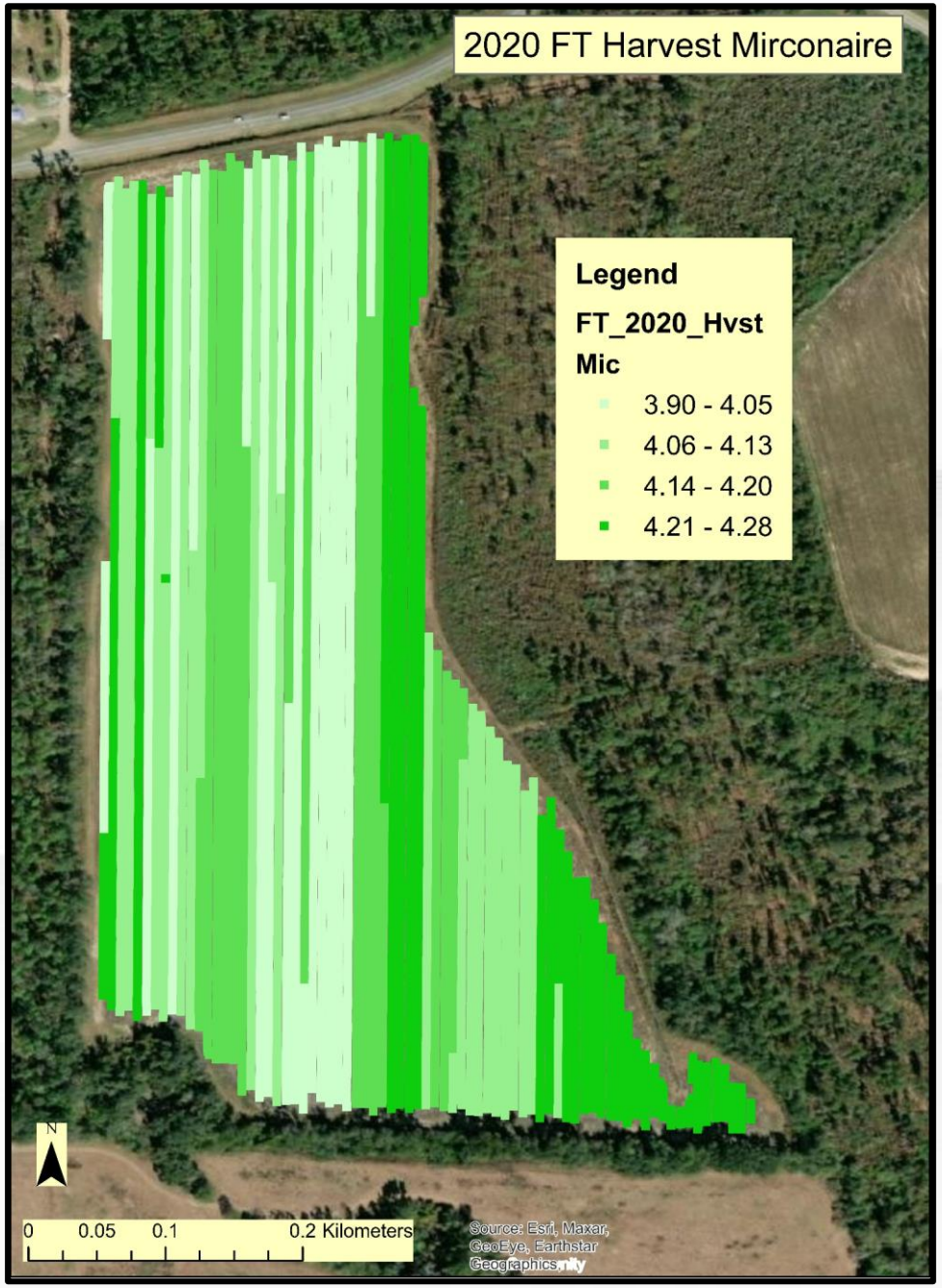

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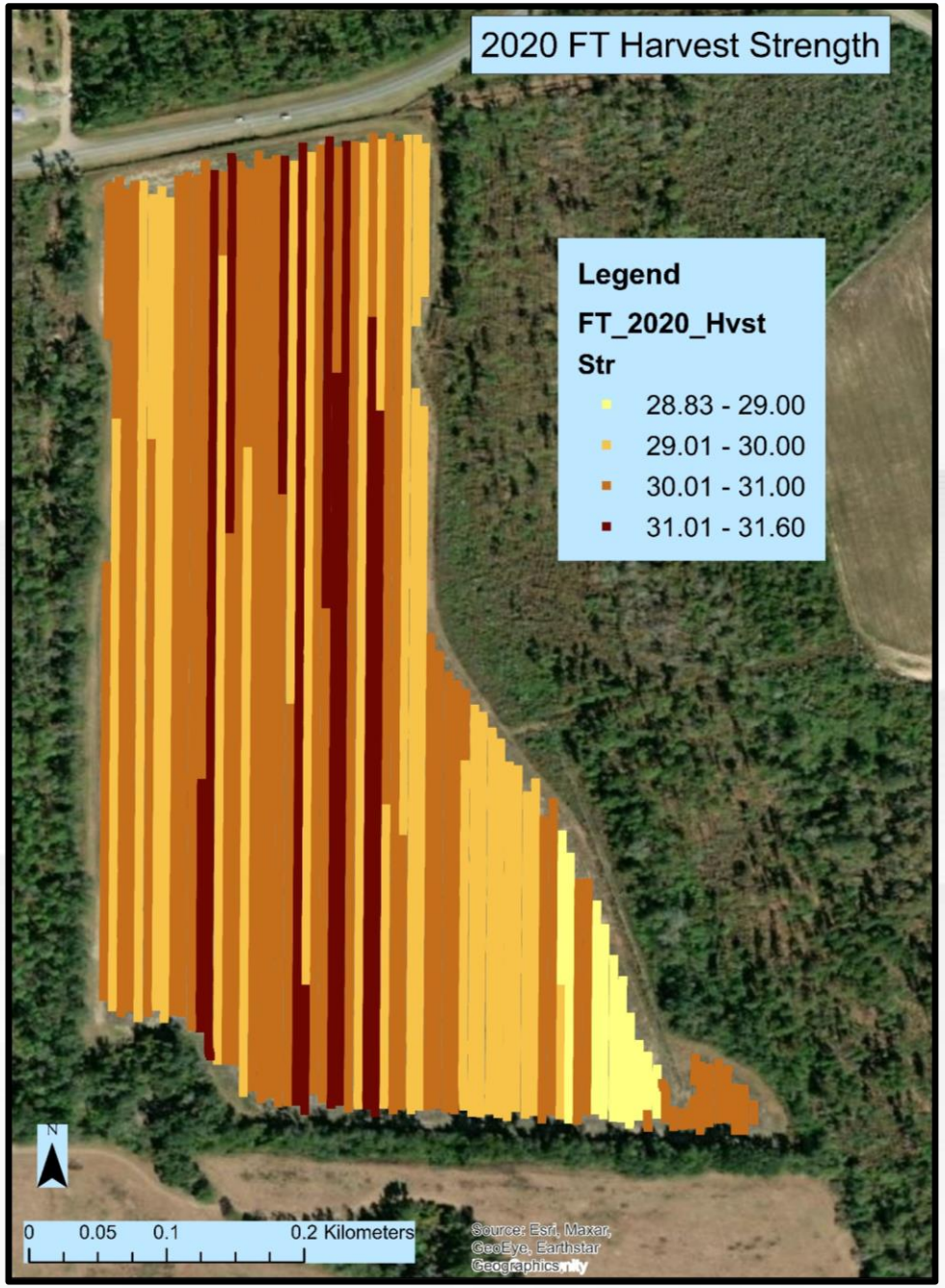

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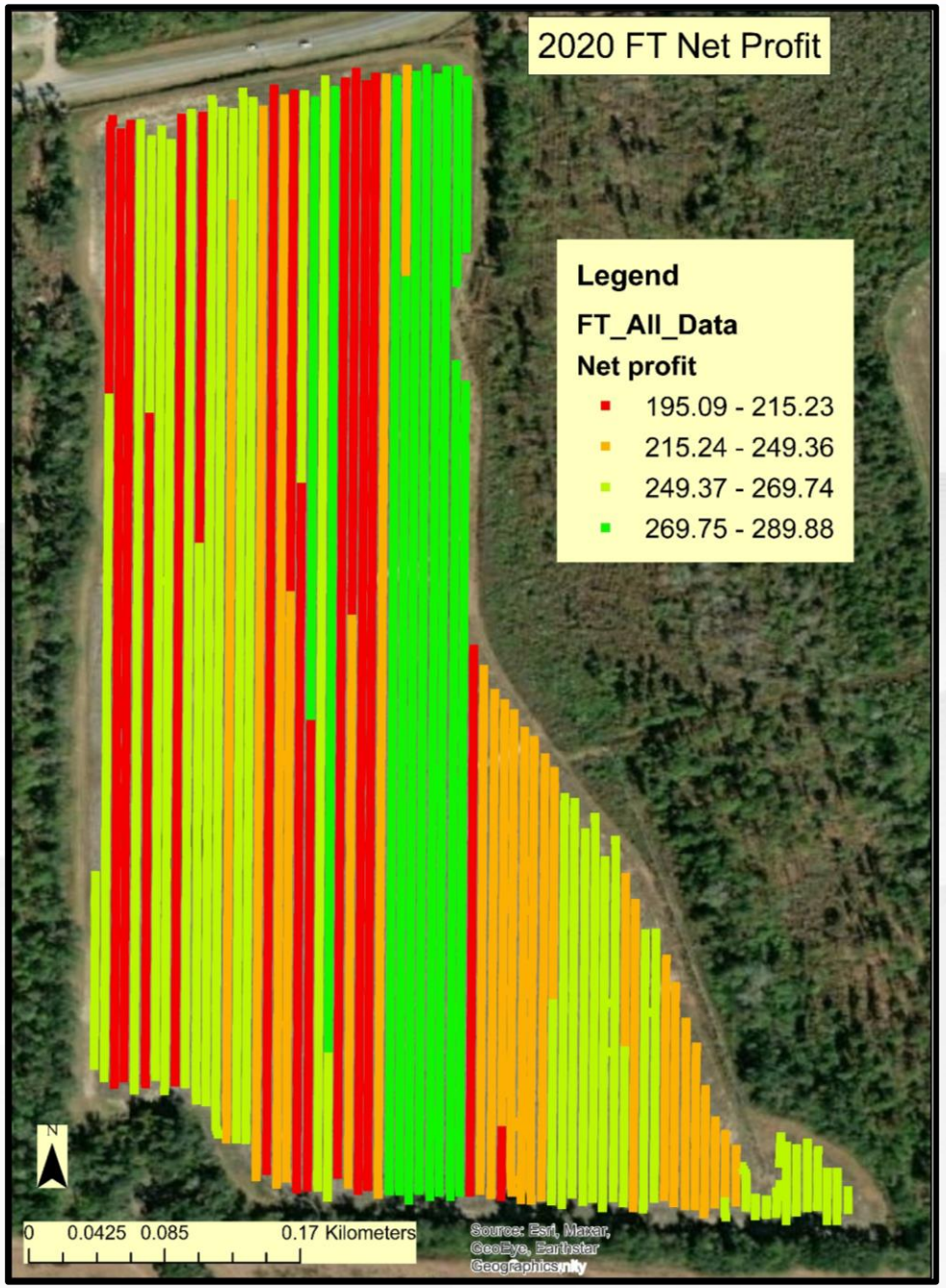

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- The HID system is used to identify and record the RFID tag assigned serial number, and referenced to assign fiber quality data back to each individual module.
- Utilizing the recorded travel path and the time stamp feature of the HID system, the module averaged fiber quality data can be assigned to areas in the field.
- This allows for the spatial visualization of the various fiber parameters and economic value of the fiber from each module.

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Questions?

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