2022 Cotton Weed Control Update

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To summarize 2021 and forecast 2022

My questions

- If Roundup price hits $80-100 per gallon, glufosinate and clethodim are hard to be found and very expensive too, what is your plan to manage pigweeds and annual grasses?

- With fertilizer, fuel and key chemical prices blow the roof, will you still manage all your acreage using the same program as before?

- Let’s say If you can’t secure enough key CP chemicals for all your acreage. You must take a 20% volume reduction compared to 2021, what is you plan for pest control?

My biggest concern after 2022

When you don’t have enough glufosinate and Group 15 herbicides but can get enough dicamba…

An example of dicamba and tractor tire survivor

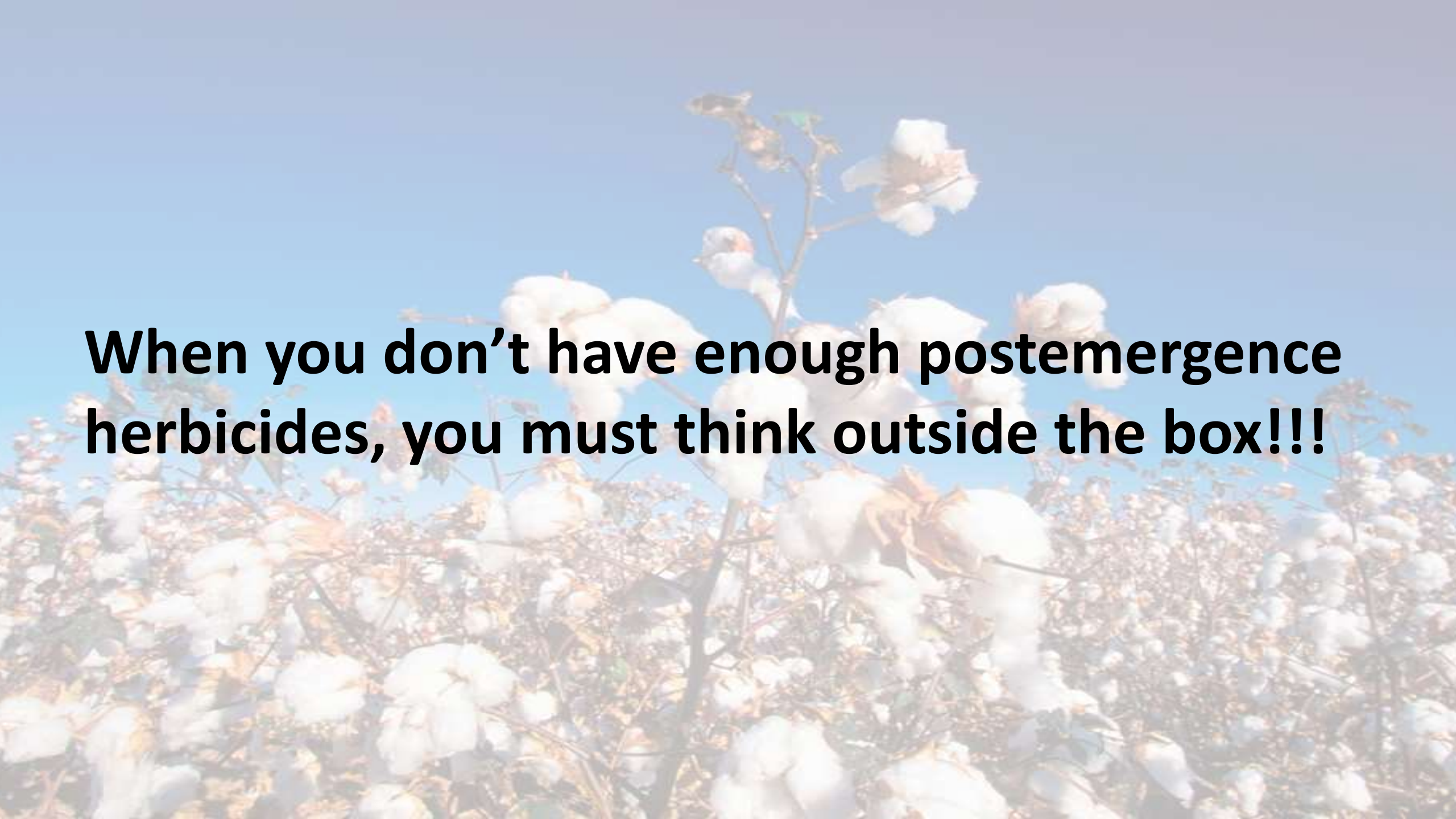
Baldwin County, AL

These are also likely to happen again…



Goosegrass survived Roundup Powermax and Xtendimax tank mix in summer 2020
Roundup Powermax was only used at 22 oz/A
This is what happen when you spray late and cut rates…

Residual was only used in burndown
No PRE



When you don’t have enough postemergence herbicides, you must think outside the box!!!

NTC

NTC

Direx 20 oz/A @ 50 DAT

Cotoran 2 pt/A @ 50 DAT

Reflex 12 oz/A @ 50 DAT

Warrant 3.2 pt/A @ 50 DAT

Xtendimax 44 oz/A @ 50 DAT

Reflex 12 oz + Cotoran 2 pt/A @ 50 DAT

Reflex 12 oz + Warrant 3.2 pt/A @ 50 DAT

Reflex 12 oz + Direx 20 oz/A @ 50 DAT

Brake F16 16 oz/A @ 50 DAT

Warrant 3.2 pt + Direx 20 oz/A @ 50 DAT

Non-treated check

Diuron 24 oz/A
21 DAT

Cotoran 32 oz/A
21 DAT

Diuron 24 oz +
Xtendimax 22 oz/A
21 DAT

Cotoran 32 oz +
Xtendimax 22 oz/A
21 DAT

At cover crop termination in May 2020

Our 2021 field data show cereal rye residue alone at 4000-6000 lb/A level suppressed pigweed germination and seedling county by 63-93%!!!

Over 99% Palmer amaranth suppression can be achieved by using both cereal rye and soil herbicides

Warrant with High Residue

Warrant in Conventionally Tilled

Macon County 42 DAP

High Residue Non-Treated

Conventionally Tilled Non-Treated Check

Reflex with High Residue

High Residue Non-Treated

Macon County 42 DAP

Reflex in Conventionally Tilled

Conventionally Tilled Non-Treated Check

Henry County Peanut 2019 Trial (68 DAP)

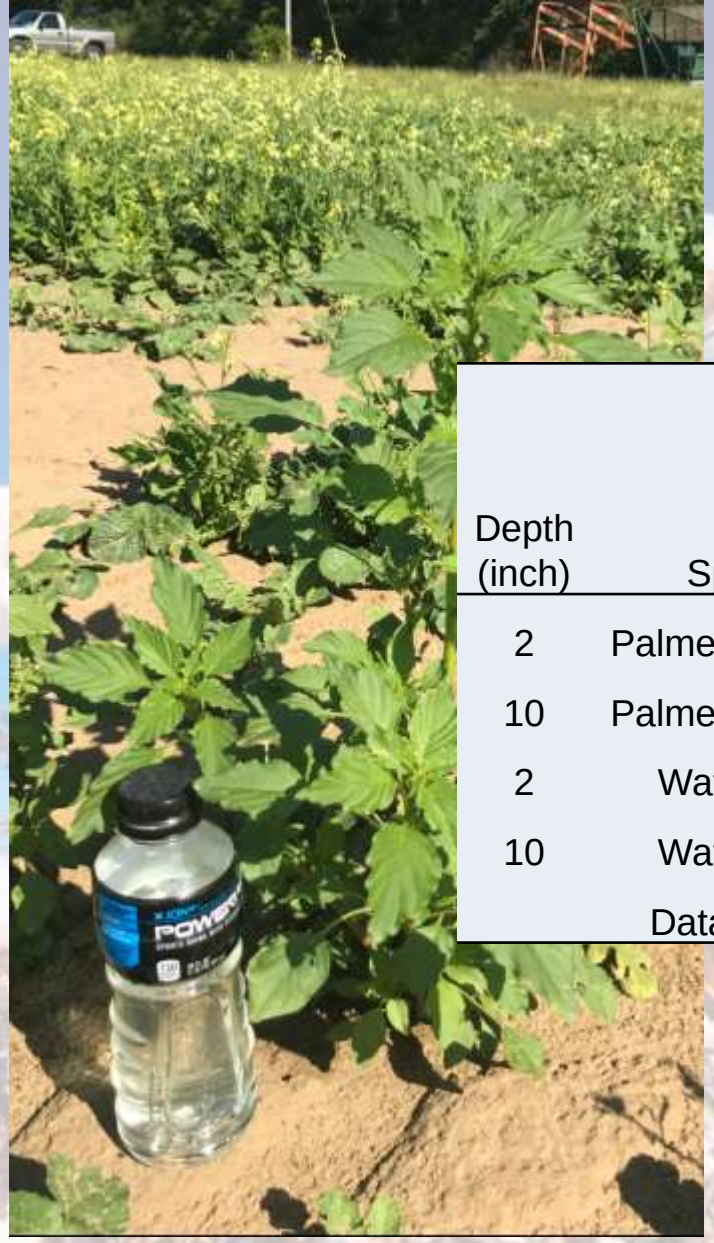
Heavy Residue (Valor PRE)

Bareground (Valor PRE)

Henry County Peanut 2019 Trial (68 DAP)

High Residue (Strongarm PRE)

Bareground (Strongarm PRE)

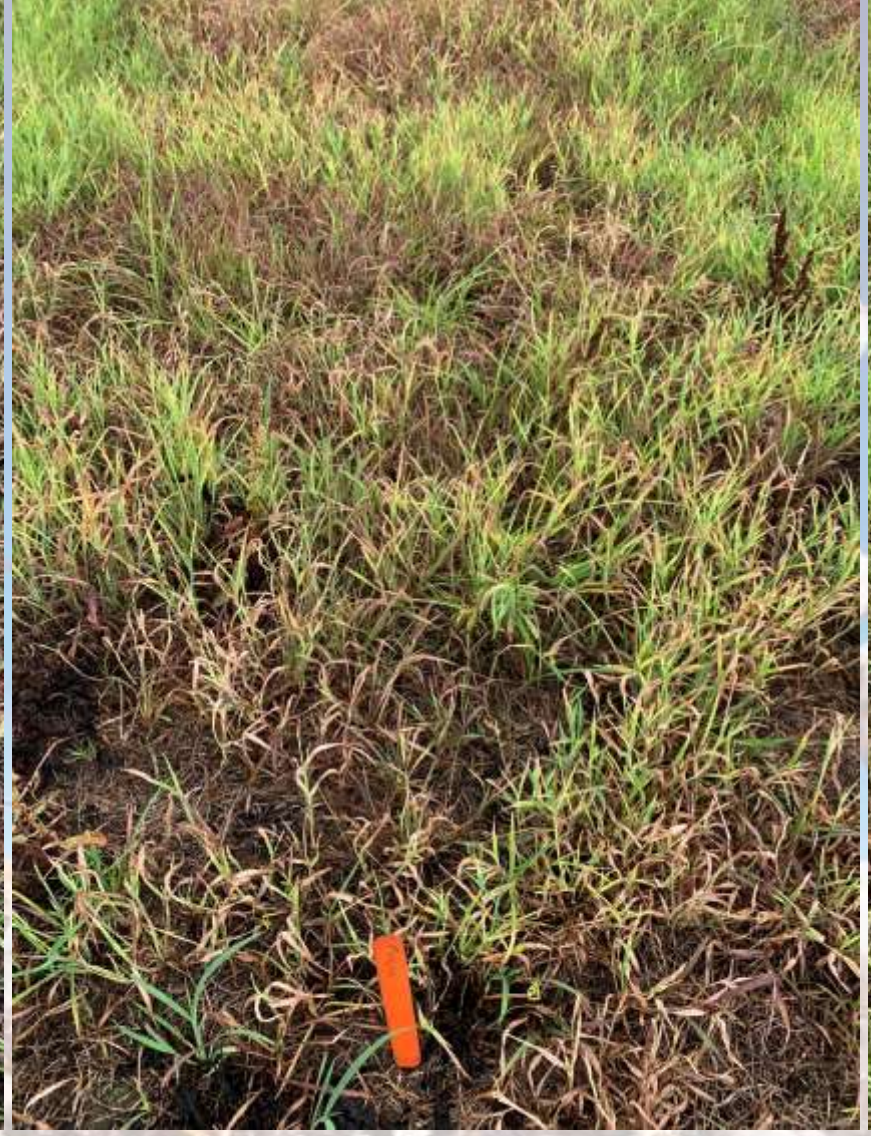


Depth (inch)	Species	Retrieval time (months)	Viable seed (%)		
			College Station	Corpus Christi	Lubbock
2	Palmer amaranth	60	0.3	1.0	3.5
10	Palmer amaranth	60	0	0	1.3
2	Waterhemp	60	0.7	2.4	2.5
10	Waterhemp	60	0.6	4.9	4.0

Data credit: Dr. Muthu Bagavathiannan, TAMU

April 30, 2017. Baldwin County

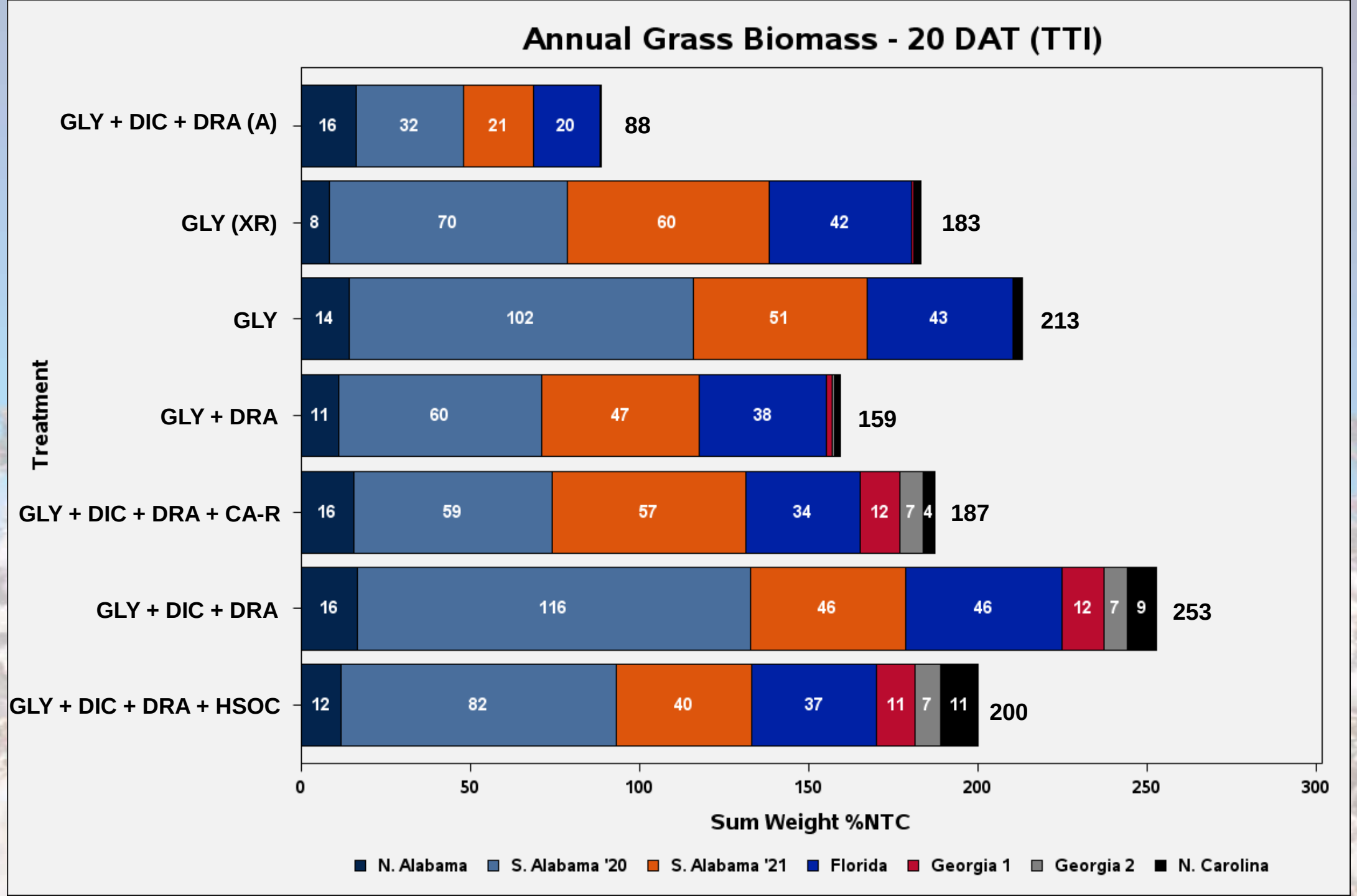
Roundup Powermax 32 oz



RUP 32 oz + Xtendimax 22 oz/A + VRA + DRA

Another formulation of glyphosate + Xtendimax 22 oz/A + VRA + DRA

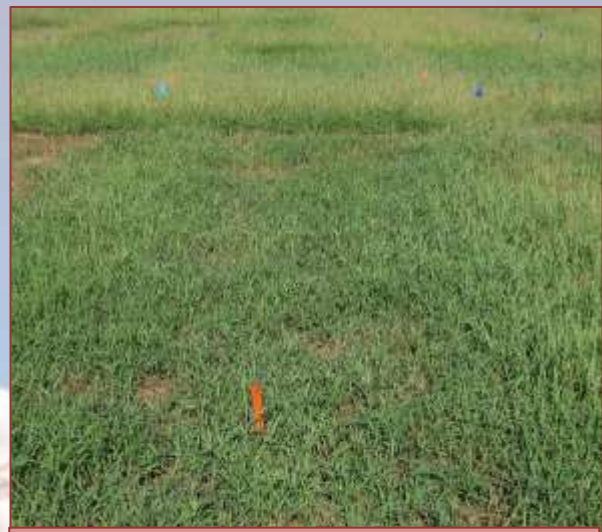
Shorter AL. 2020. All treatments applied with TTI nozzle at 15 GPA


Annual Grass Biomass - 20 DAT (TTI)
GLY + DIC + DRA (A)
16
32
21
20
88
GLY (XR)
8
70
60
42
183
GLY
14
102
51
43
213
GLY + DRA
11
60
47
38
159
GLY + DIC + DRA + CA-R
16
59
57
34
12
7
4
187
GLY + DIC + DRA
16
116
46
46
12
7
9
253
GLY + DIC + DRA + HSOC
12
82
40
37
11
7
11
200
Treatment
0
50
100
150
200
250
300
Sum Weight %NTC
N. Alabama
S. Alabama '20
S. Alabama '21
Florida
Georgia 1
Georgia 2
N. Carolina

NTC – Elmore Co.

GLY – Elmore Co.

GLY + 2,4-D – Elmore Co.



GLY + 2,4-D + GLU – Elmore Co.

*All pictures shown with hard water treatments

GLY + AMS – Elmore Co.

GLY + 2,4-D + AMS – Elmore Co.

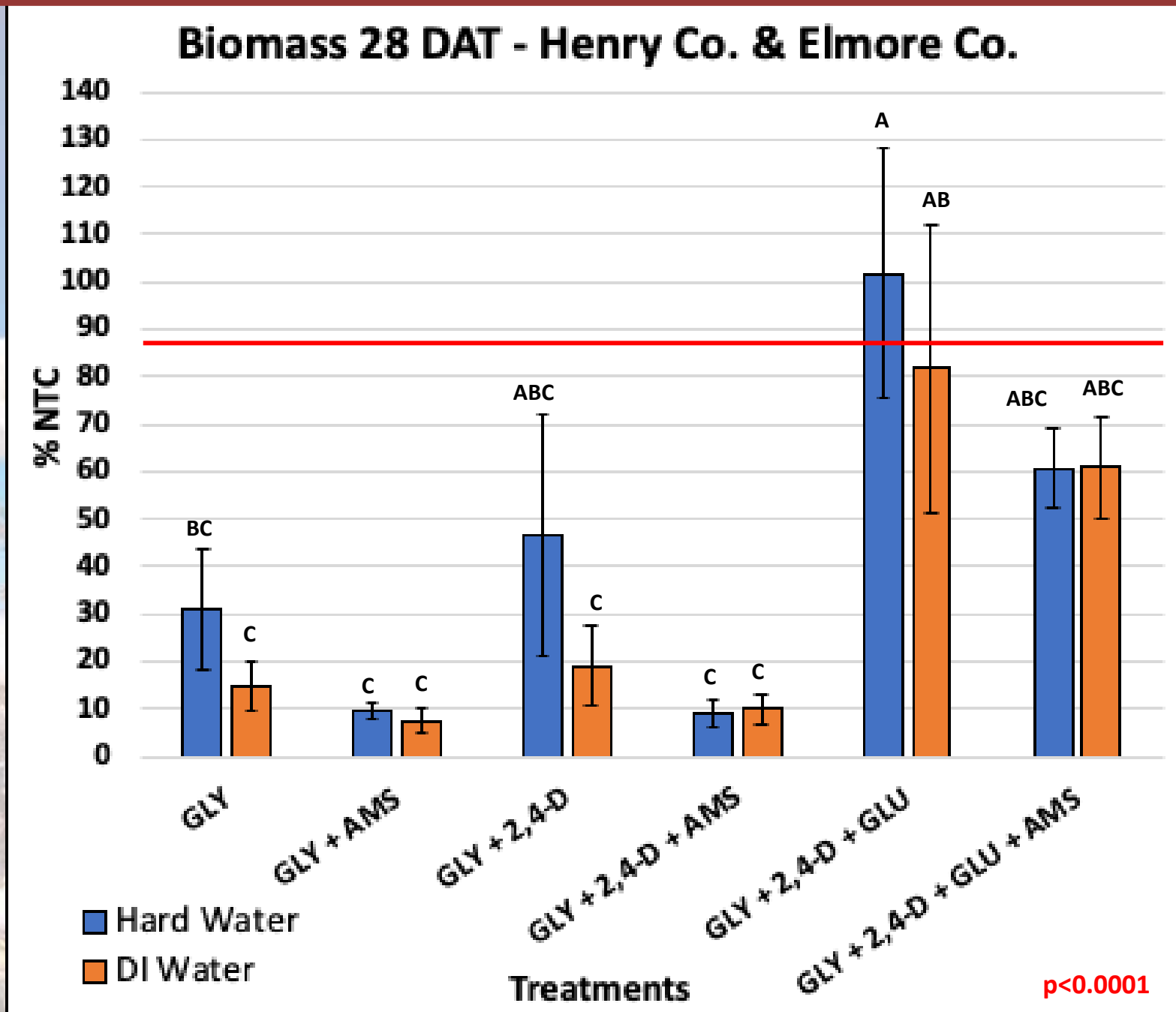
GLY + 2,4-D + GLU + AMS – Elmore Co.

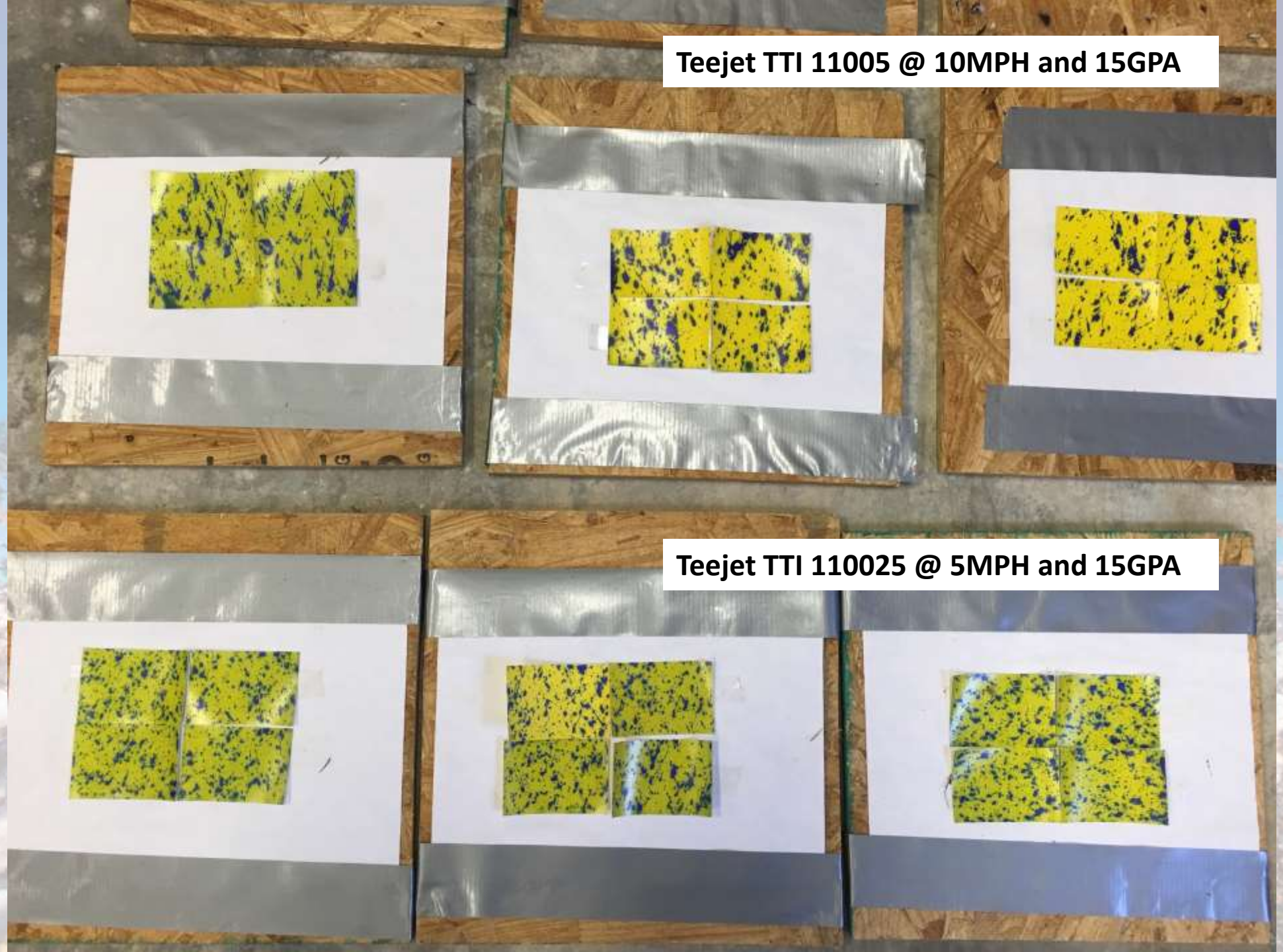
2021 Enlist grass control study (data combined over Tallassee and Headland)

Gly = Roundup Powermax
2,4-D = Enlist one
GLU = Liberty
AMS = ammonium sulfate

Means followed by the same letter are not significantly different (α=0.05)

site x treatment = 0.0555




Teejet TTI 11005 @ 10MPH and 15GPA
Teejet TTI 110025 @ 5MPH and 15GPA


Teejet TTI 110025 @ 5MPH and 15GPA
Teejet TTI 11005 @ 10MPH and 15GPA

Enlist One + Liberty + Dual Mag fb Enlist One + Liberty + Dual Mag 7 DAIT

2018

2019




NTC

Diuron 24 oz + MSMA 2 pt/A

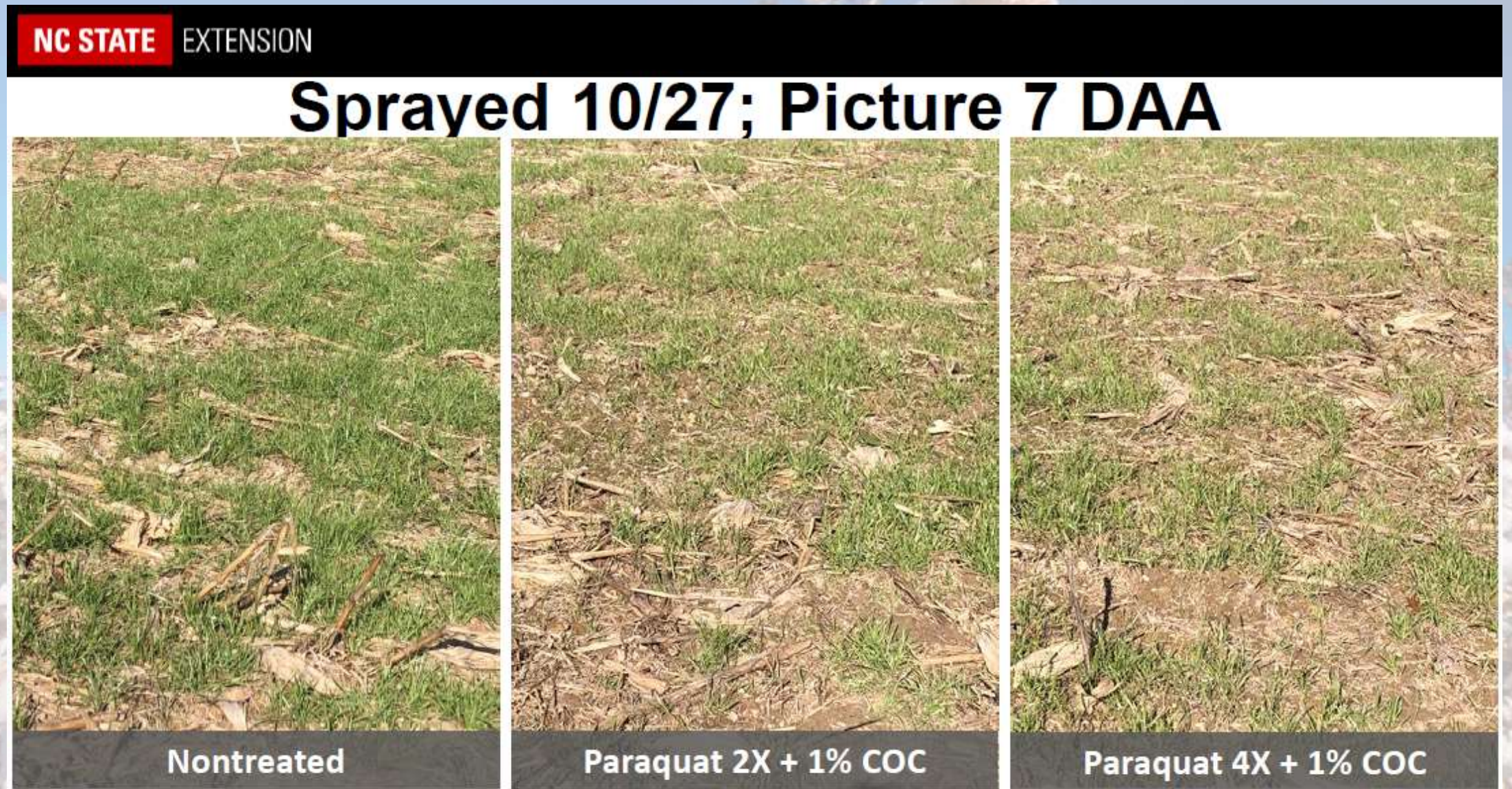
Roundup Powermax + Tavium + Diuron 24 oz/A

July 14 2021. Headland AL. 2 weeks after treatment. Hood spray trial

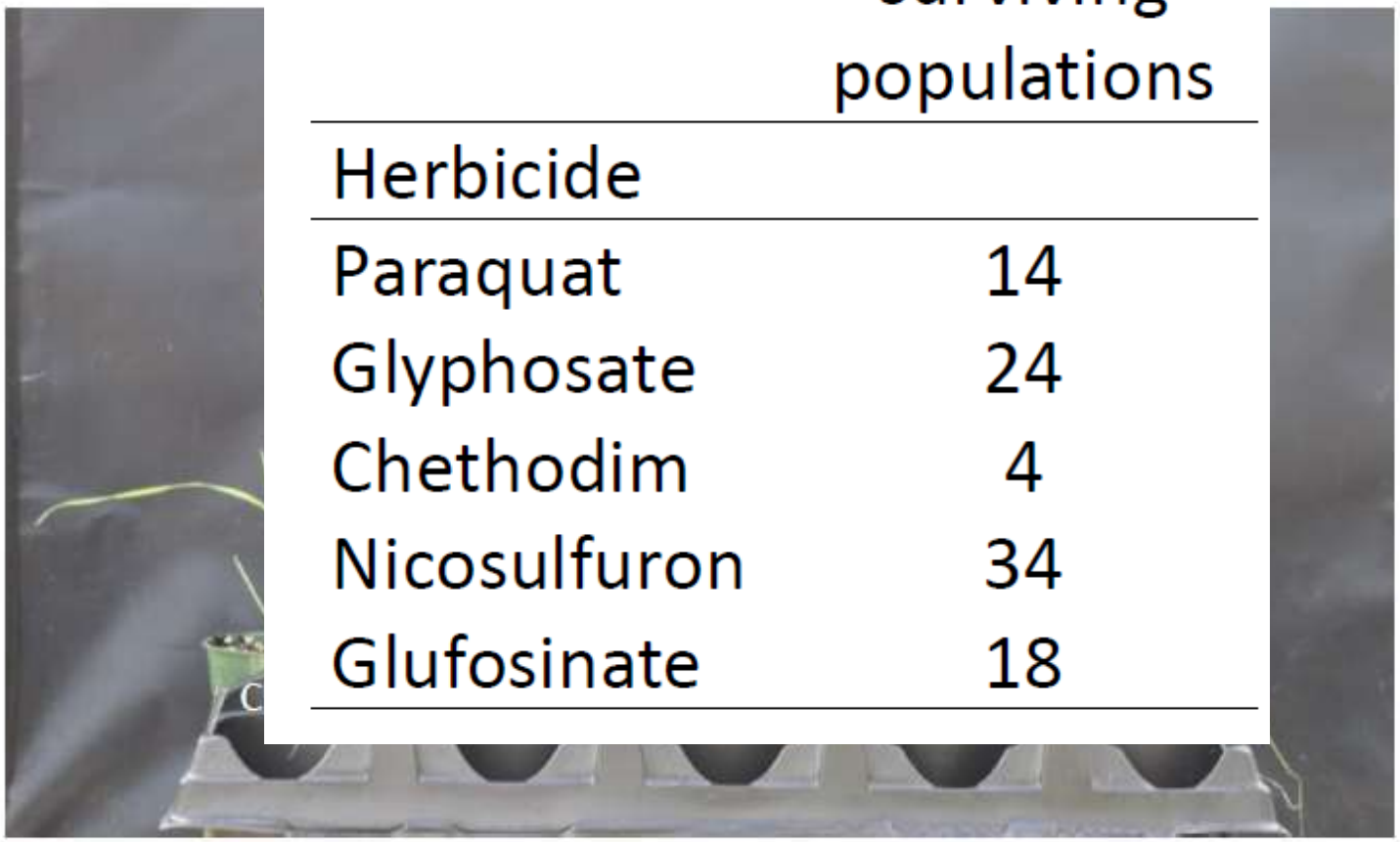
Recommendations

- Secure chemicals as early as possible. Delaying planting may happen
- Use paraquat in burndown and save Roundup for cash crop
- Put down heavy residuals down in burndown and PRE
- Use cereal grain cover crop in combination with residuals
- Start clean!!!
- Spray when weeds are small!!!
- Separate glyphosate from dicamba if needed, only spray Liberty on pigweeds and broadleaf weeds
- Make sure every droplet of postemergence herbicide works for you to the fullest
- Know where you may can skip application, and where you have to spray
- Let very bad areas go (mow it down)
- Layby rig, hood sprayer, weed wiper, wick bar, cultivator…

Ryegrass resistance in NC



NC STATE EXTENSION

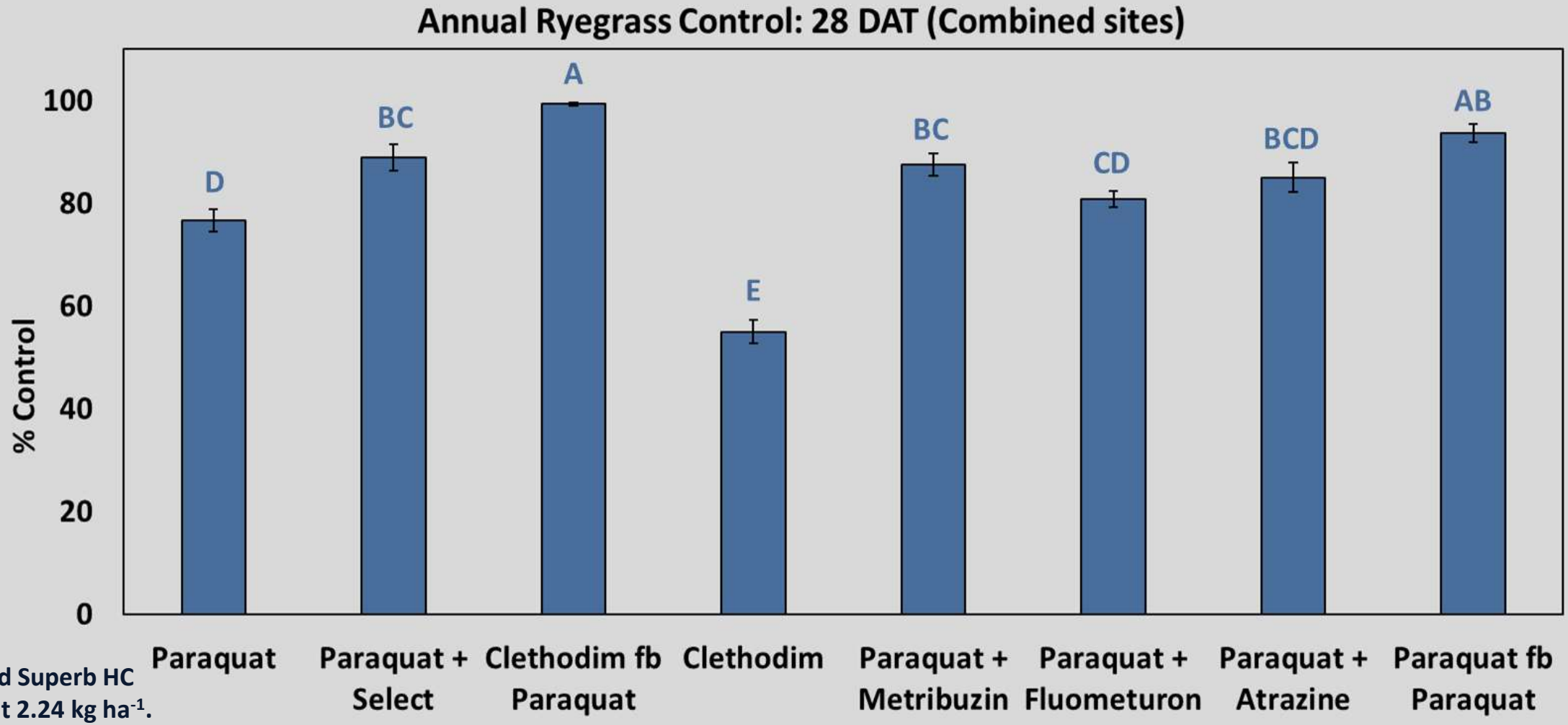


Herbicide	Number of surviving populations
Paraquat	14
Glyphosate	24
Chethodim	4
Nicosulfuron	34
Glufosinate	18

Legend:
SB1 population at 3 days after application. From left to right: nontreated control, 16 floz/a, 32 floz/a, 128 floz/a, and 1024 floz/a.

Ryegrass visual control rating (Headland and Fairhope)

28 DAT:



Treatment P<0.001

All treatments included Superb HC at 0.5% v/v and AMS at 2.24 kg ha^{-1}. Means followed by the same letter in same color are not significantly different(α=0.05);

NTC

Clethodim

Paraquat + Clethodim

Paraquat fb Paraquat

Clethodim fb Paraquat

14 days after treatment, Fairhope AL. April 30, 2021

7 days between 1st and 2nd application

Get the most out of paraquat and glufosinate

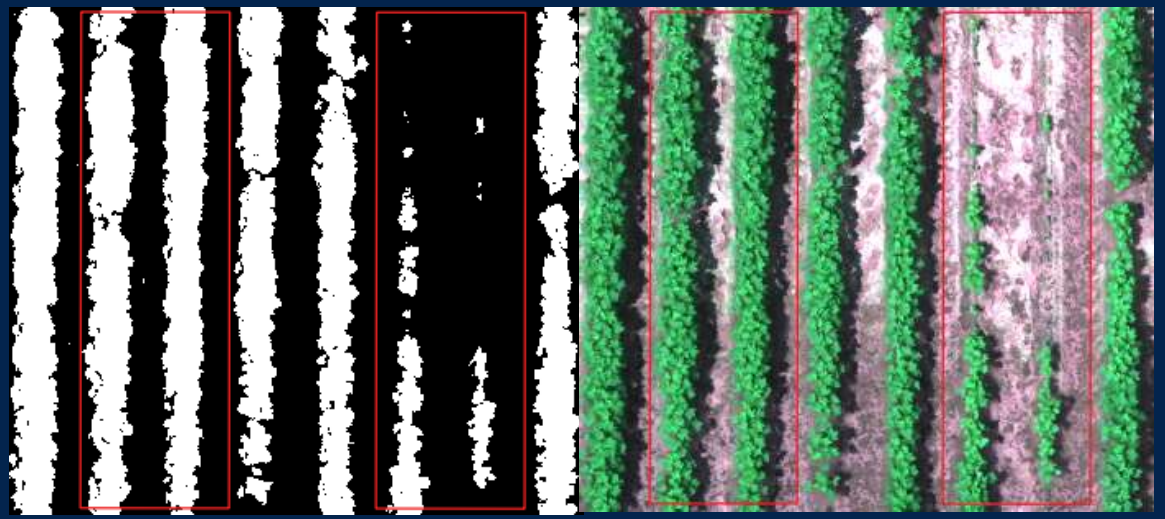
1. Do Not spray when it is very cloudy. Light intensity is very important for efficacy
2. Do Not use dicamba nozzles. Medium to coarse droplets work the best
3. Do Not spray glufosinate at night or close to sunset
4. Do Not use less than 15 GPA, slow down your sprayer
5. When spraying thick weeds and canopy, use high GPA + DRA will increase control
6. Add AMS to enhance control, also add COC or MSO with paraquat in burndown

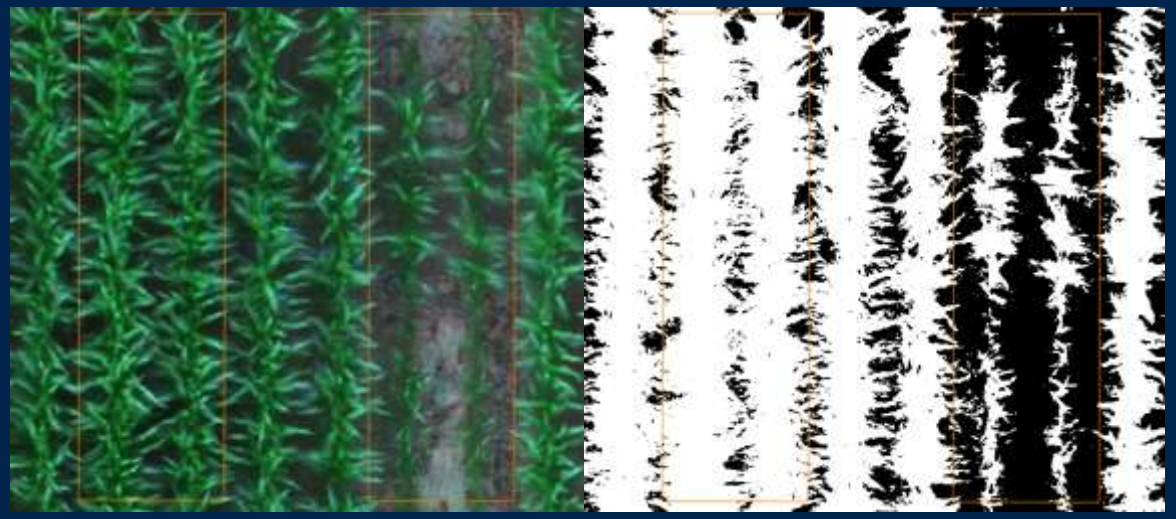
Plot Analysis- QGIS

1. Create plot boundaries, using Plot Boundary Plugin
2. Generate Visible-Band Difference Vegetation Index (VDVI) index for green color thresholding

$$\text{VDVI} = \frac{(2 * Green - Red - Blue)}{(2 * Green + Red + Blue)}$$

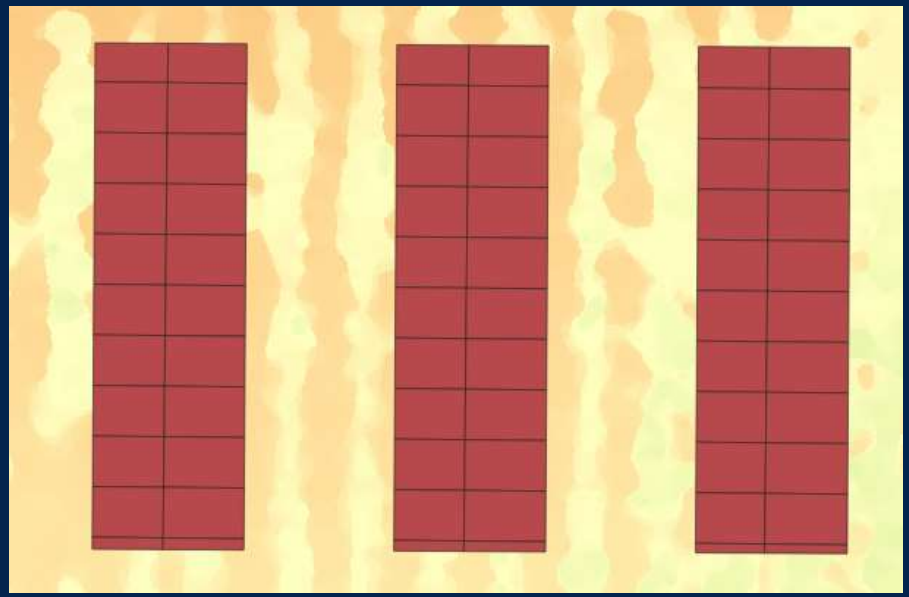
3. Determine threshold through trial and error
4. Use formula in Raster Calculator VDVI < threshold to create Boolean
   a) 1 (White)= Green, 0 (Black) = Soil)
   b) Usually between 0.05 and -0.20. Often the two crops required separate values

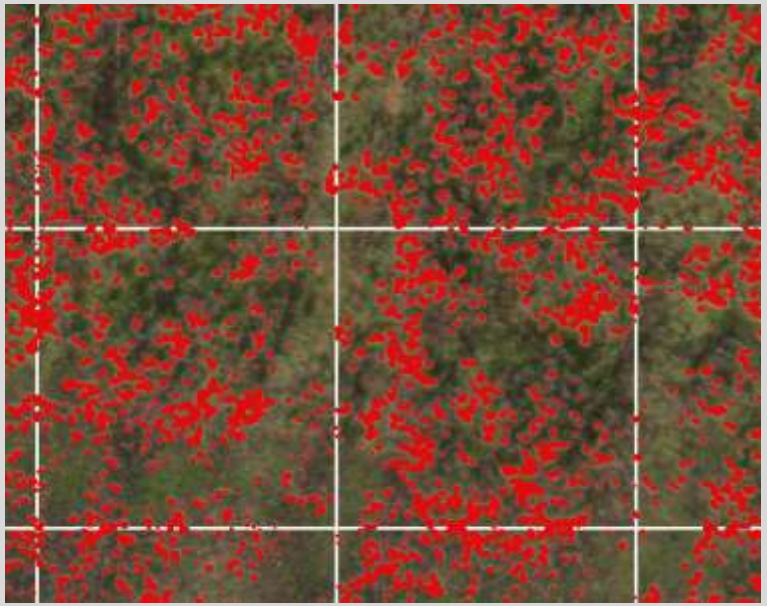




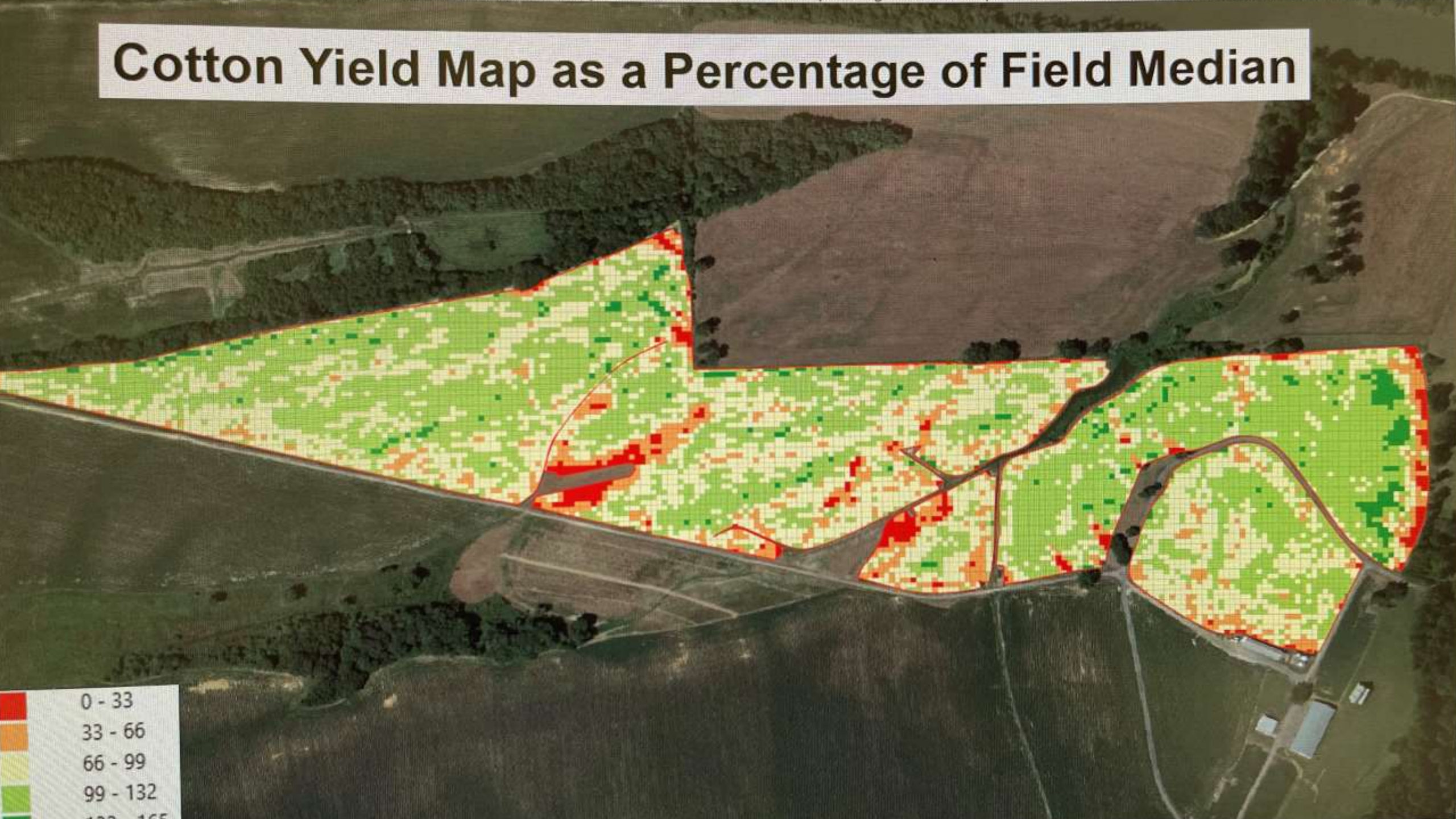
Plot Analysis Heights - QGIS

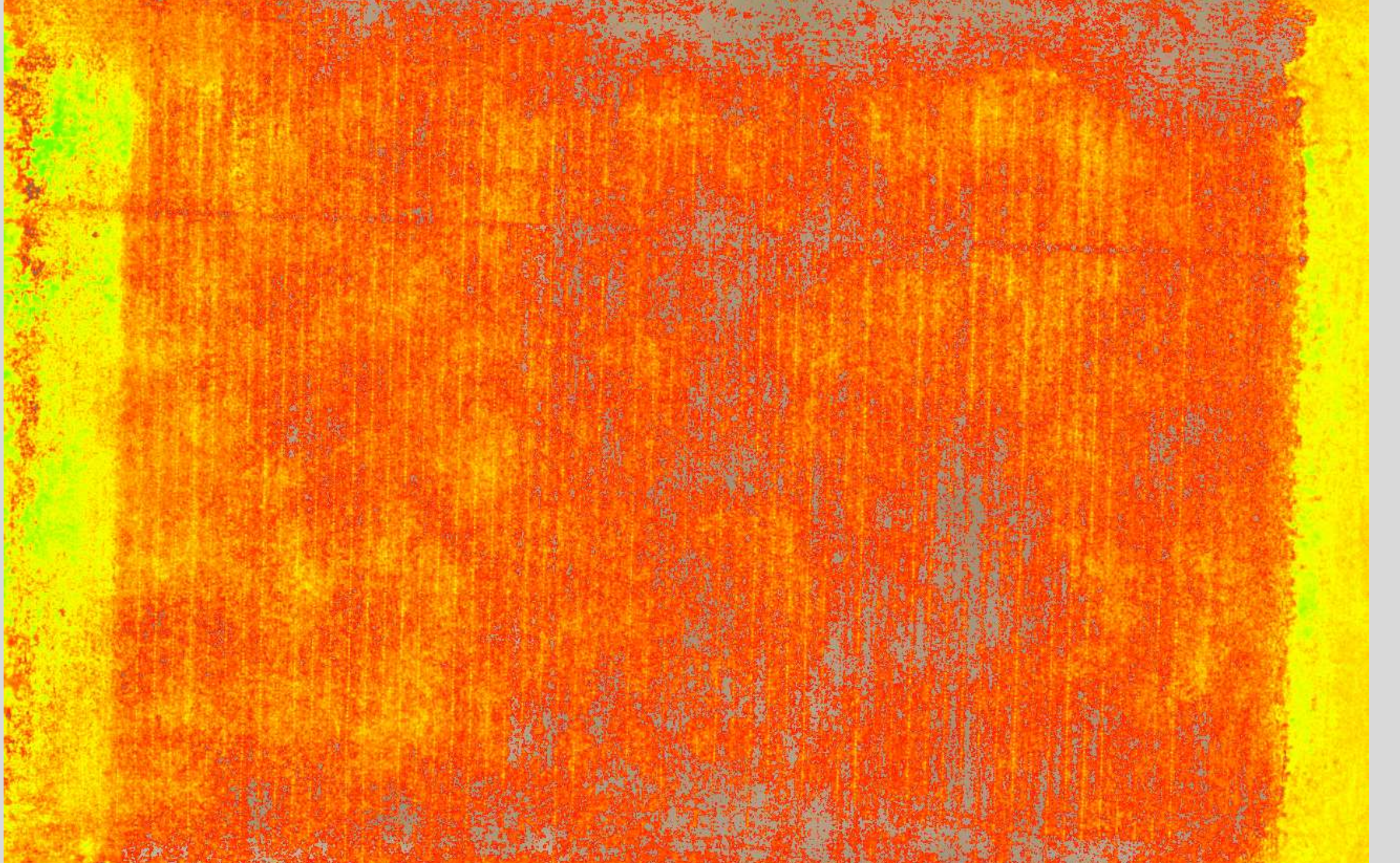
1. Create a grid over the plot of the DSM which split each row into 10 sections
2. Run Zonal Statistics tools on the grid and select range as the output statistic.
   a) Should result in the highest value within the plot (Crop) and the lowest value (Soil) with ~20 samples per plot
3. Use the Join by Location (Summary) tool to get a mean range value for each plot

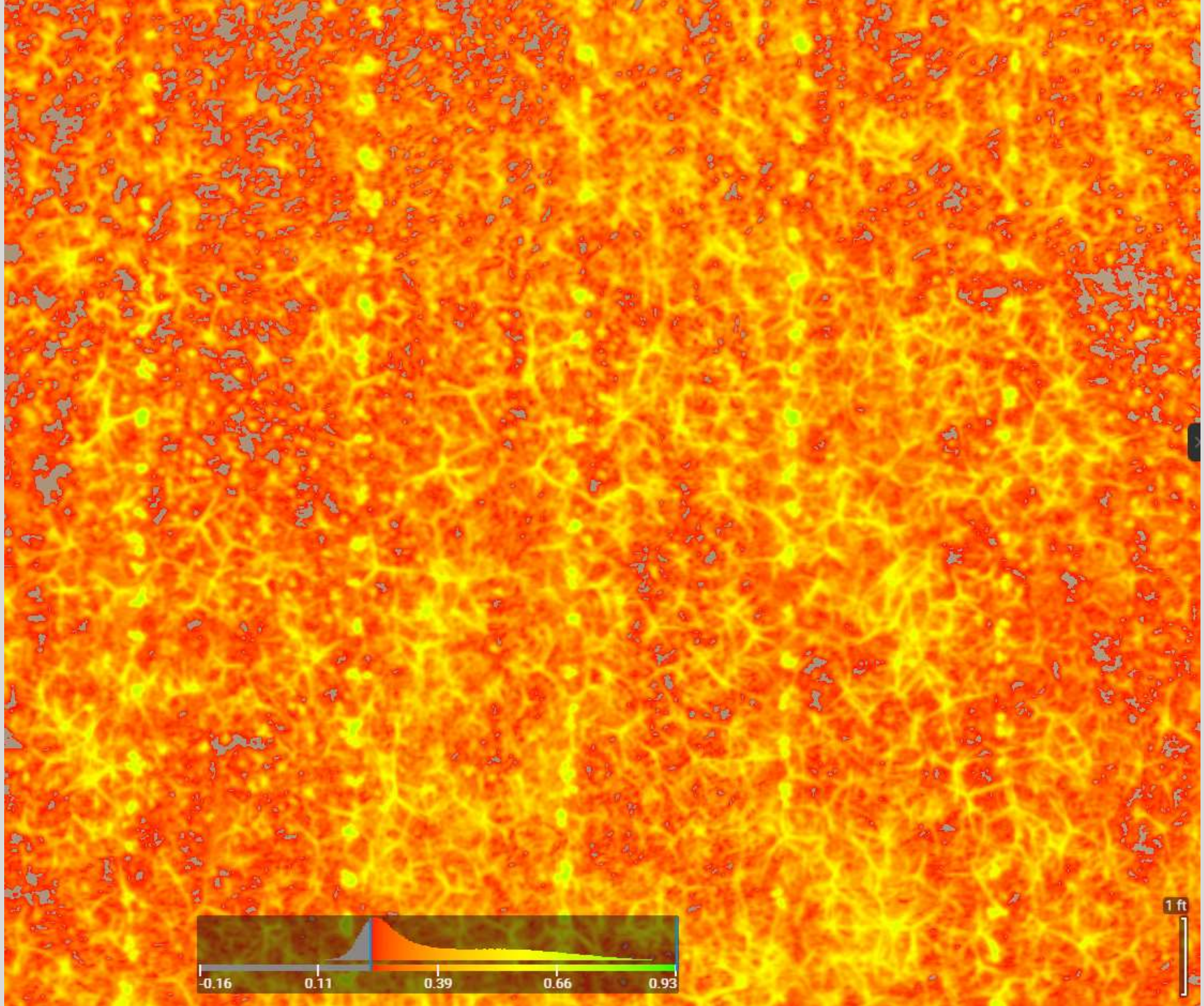


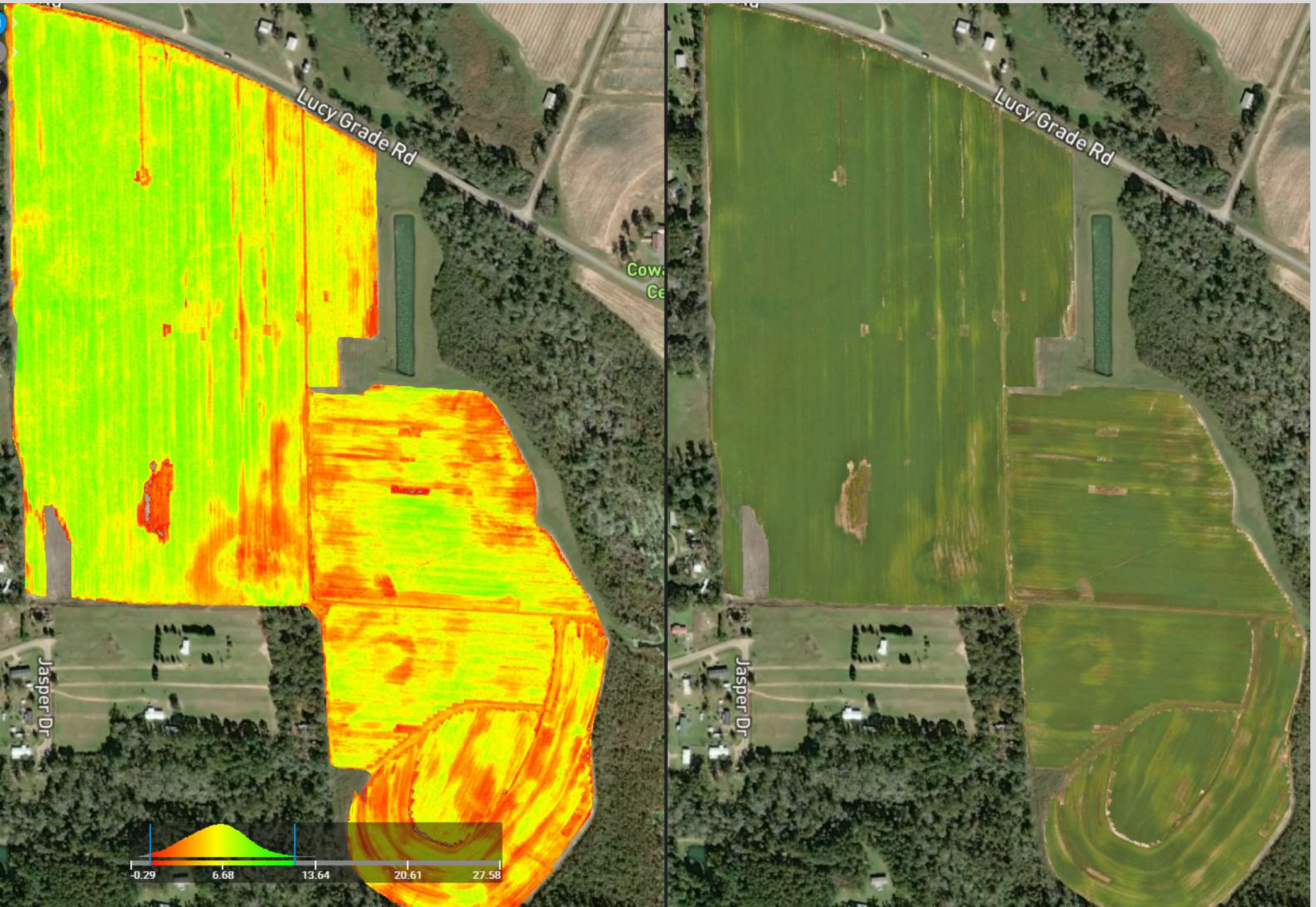


Cotton Yield Map as a Percentage of Field Median

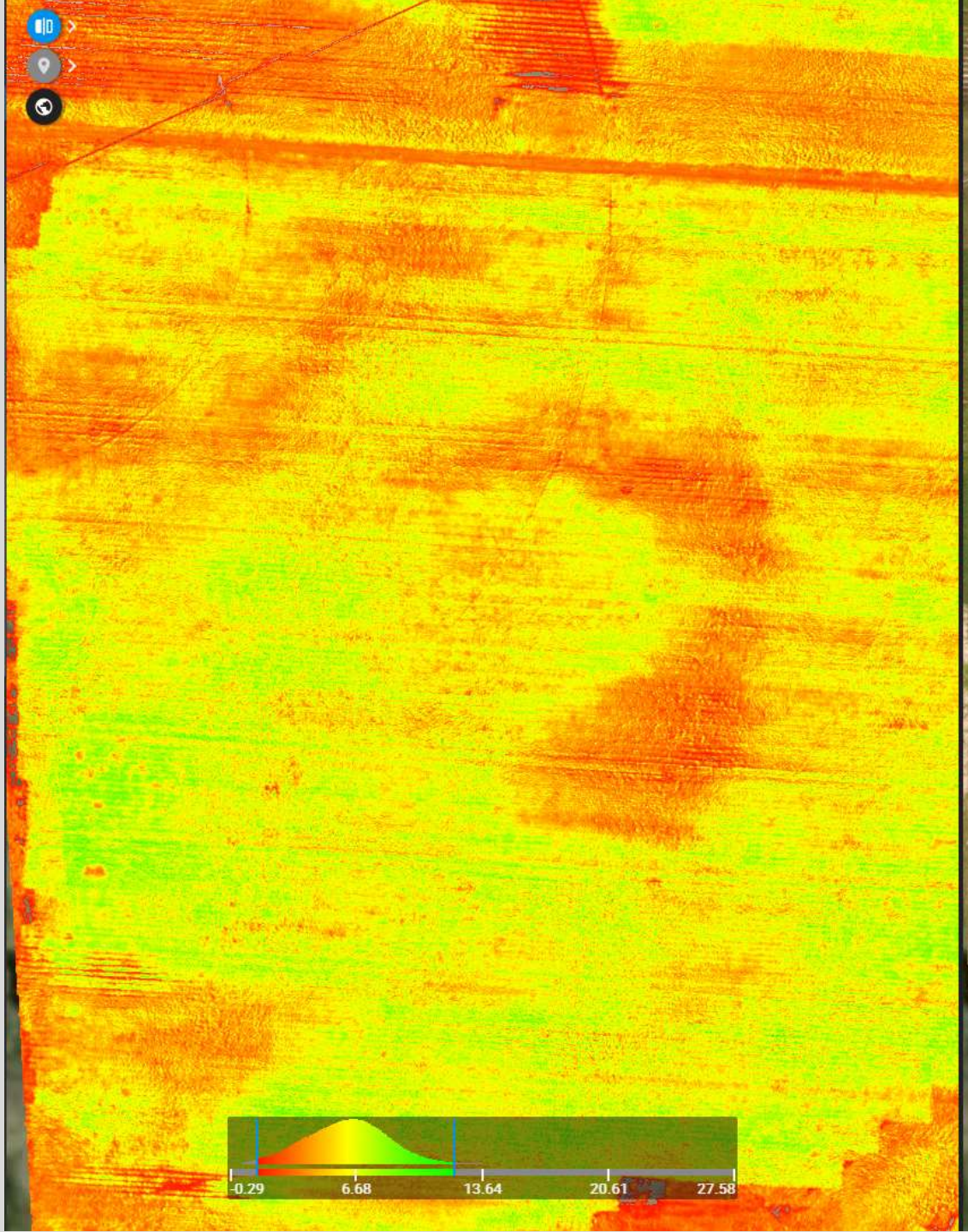


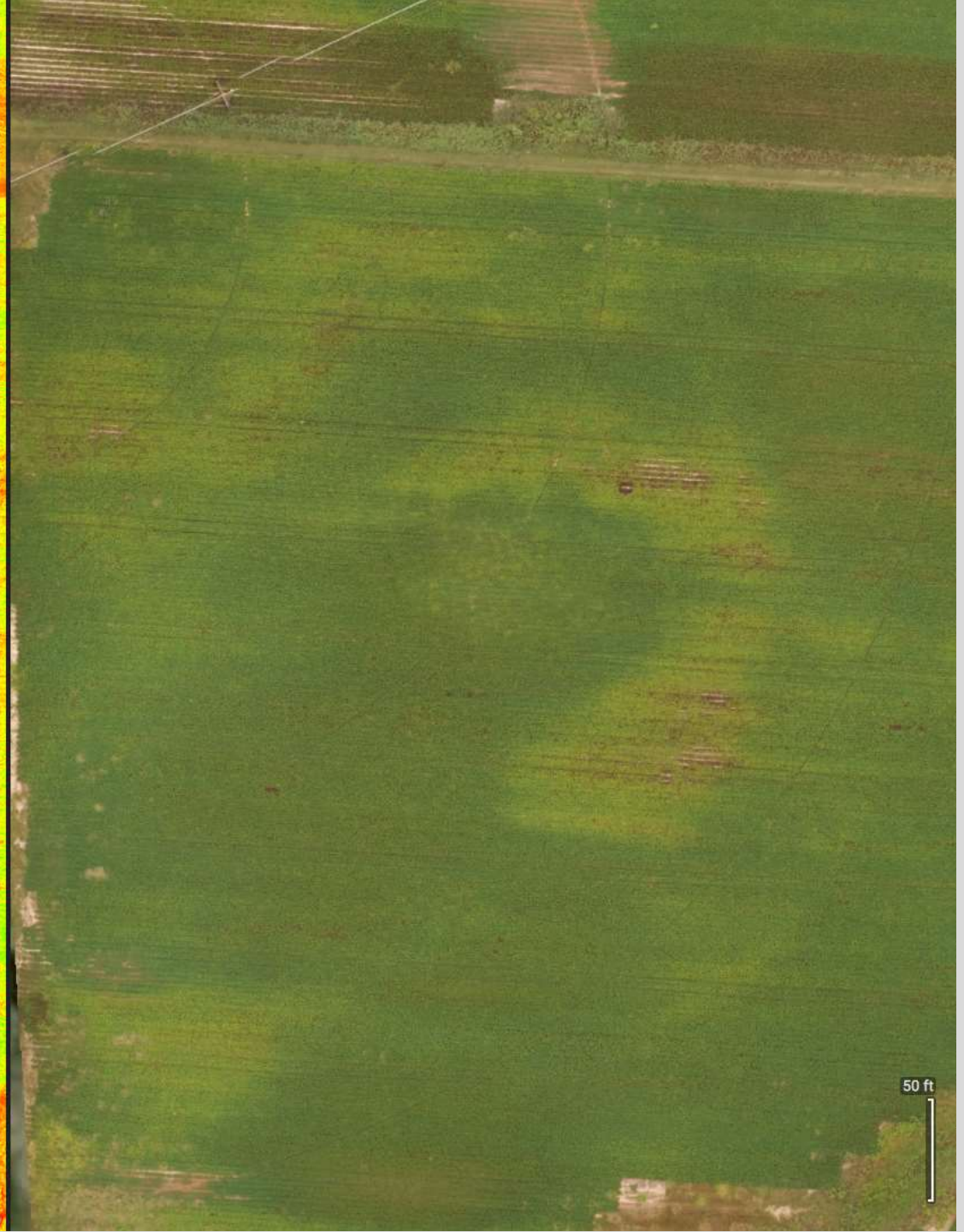


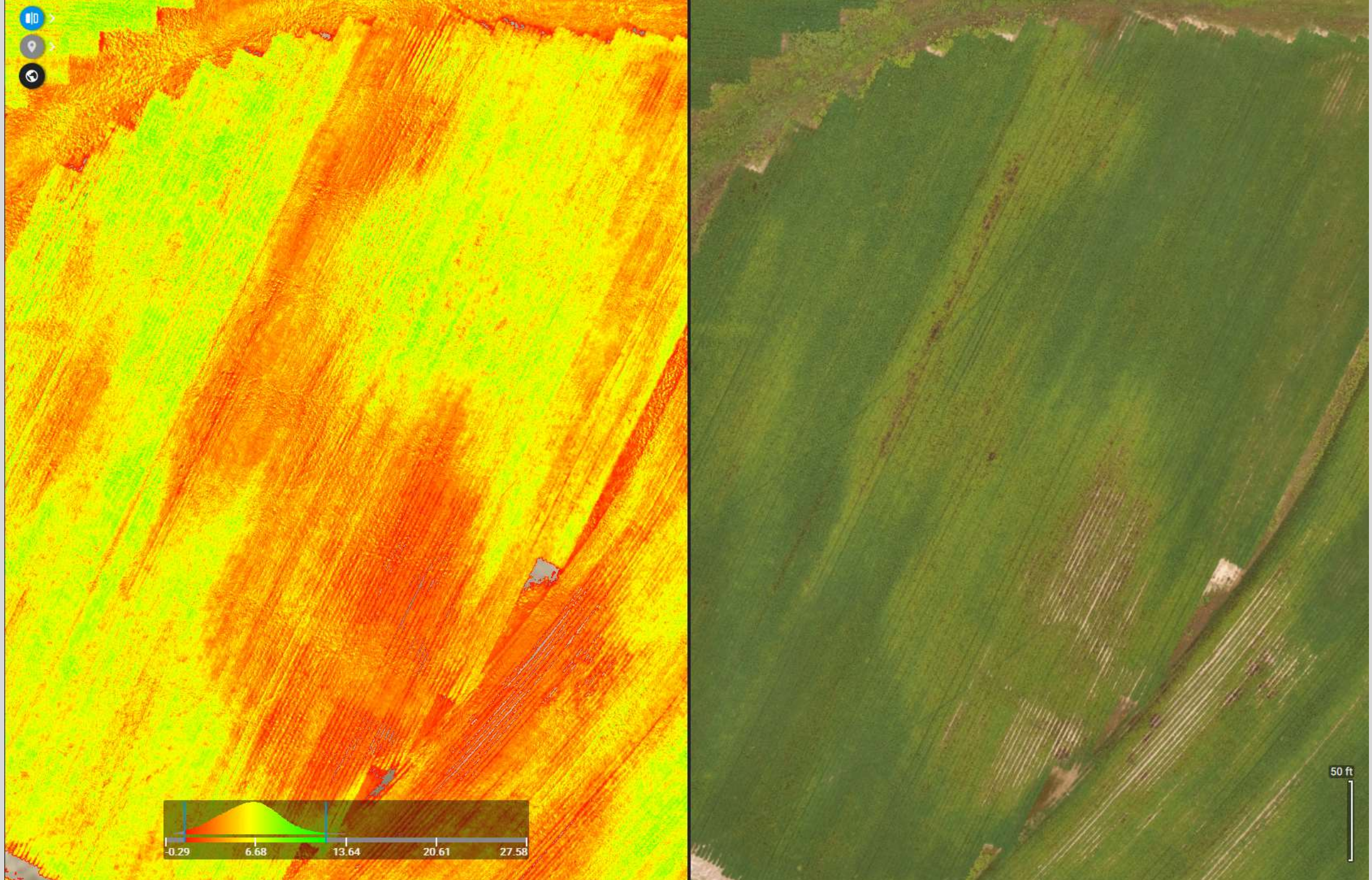

-0.16
0.11
0.39
0.66
0.93
1 ft

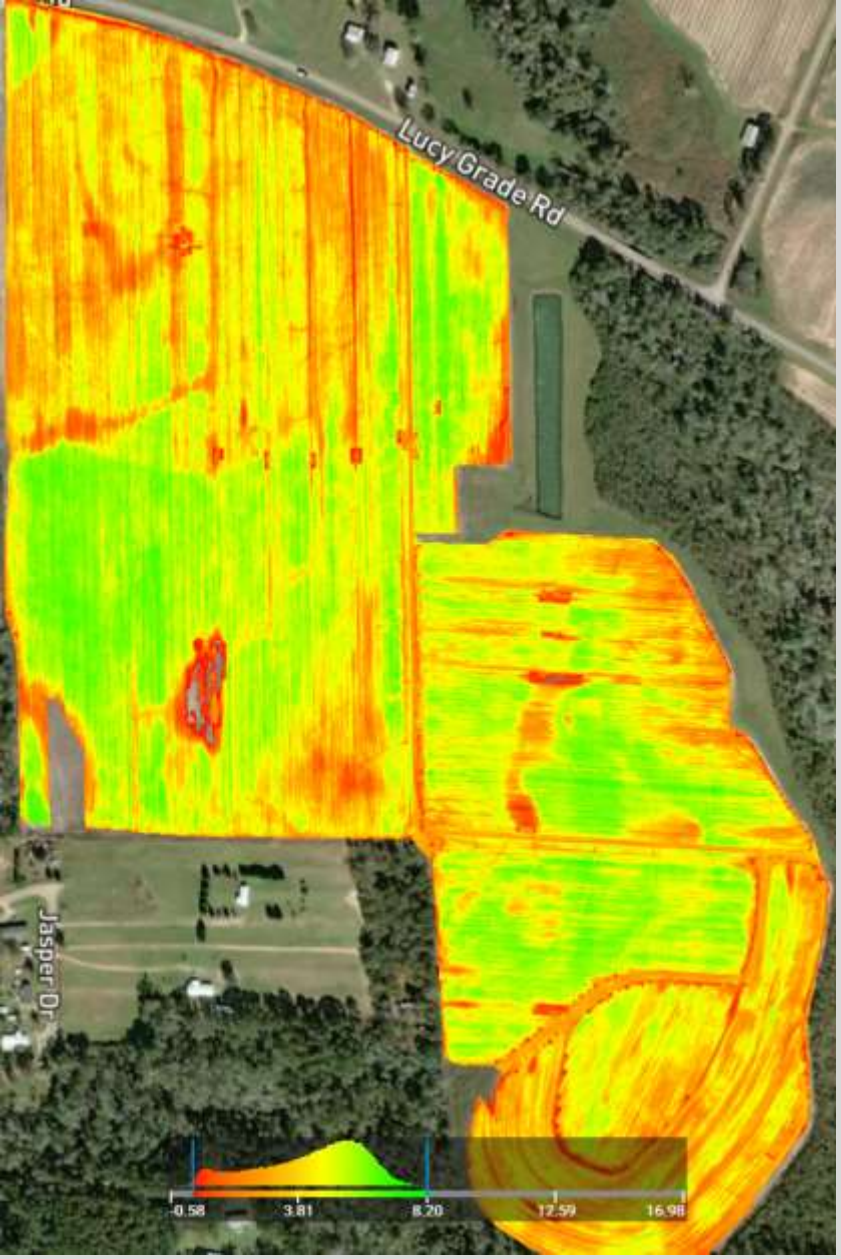


Oct 4, 2021
Irrigated peanut field SE of Dothan

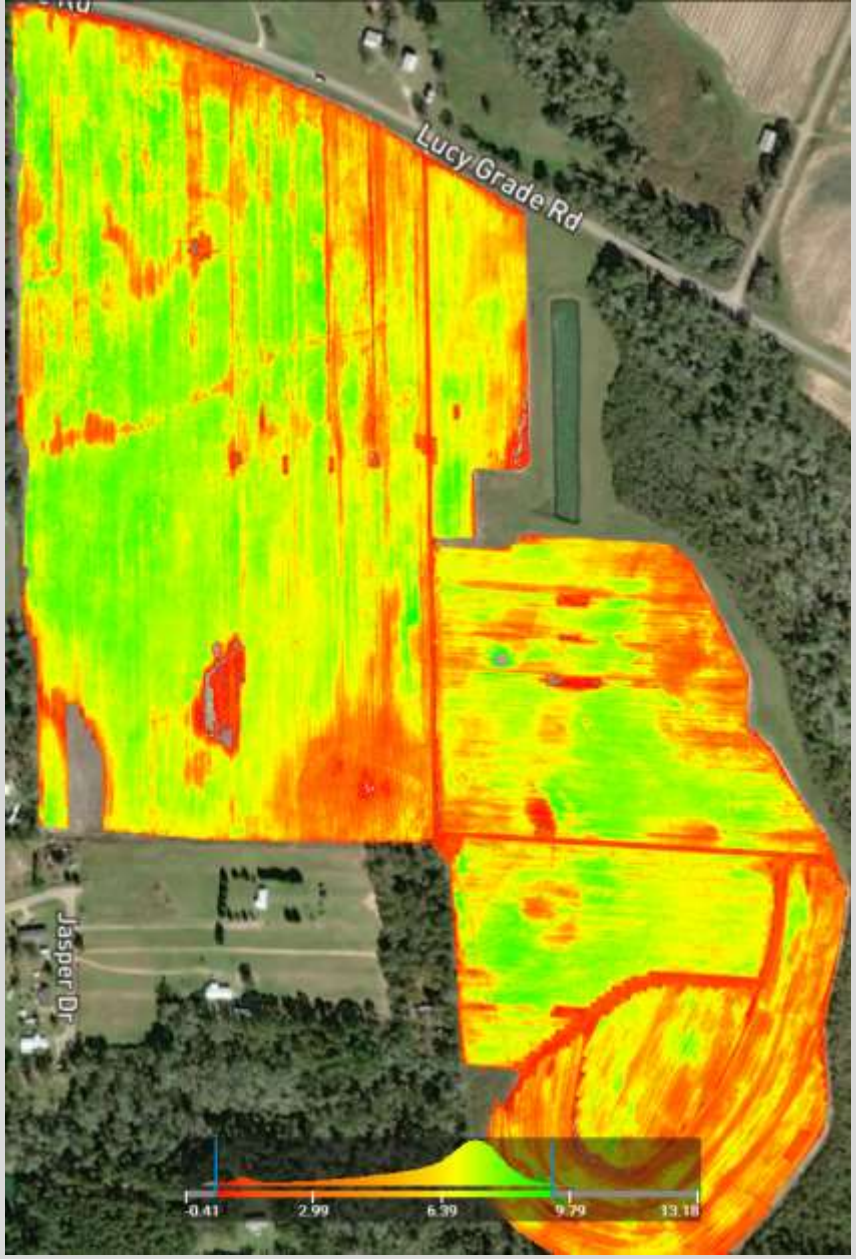

-0.29
6.68
13.64
20.61
27.58


50 ft

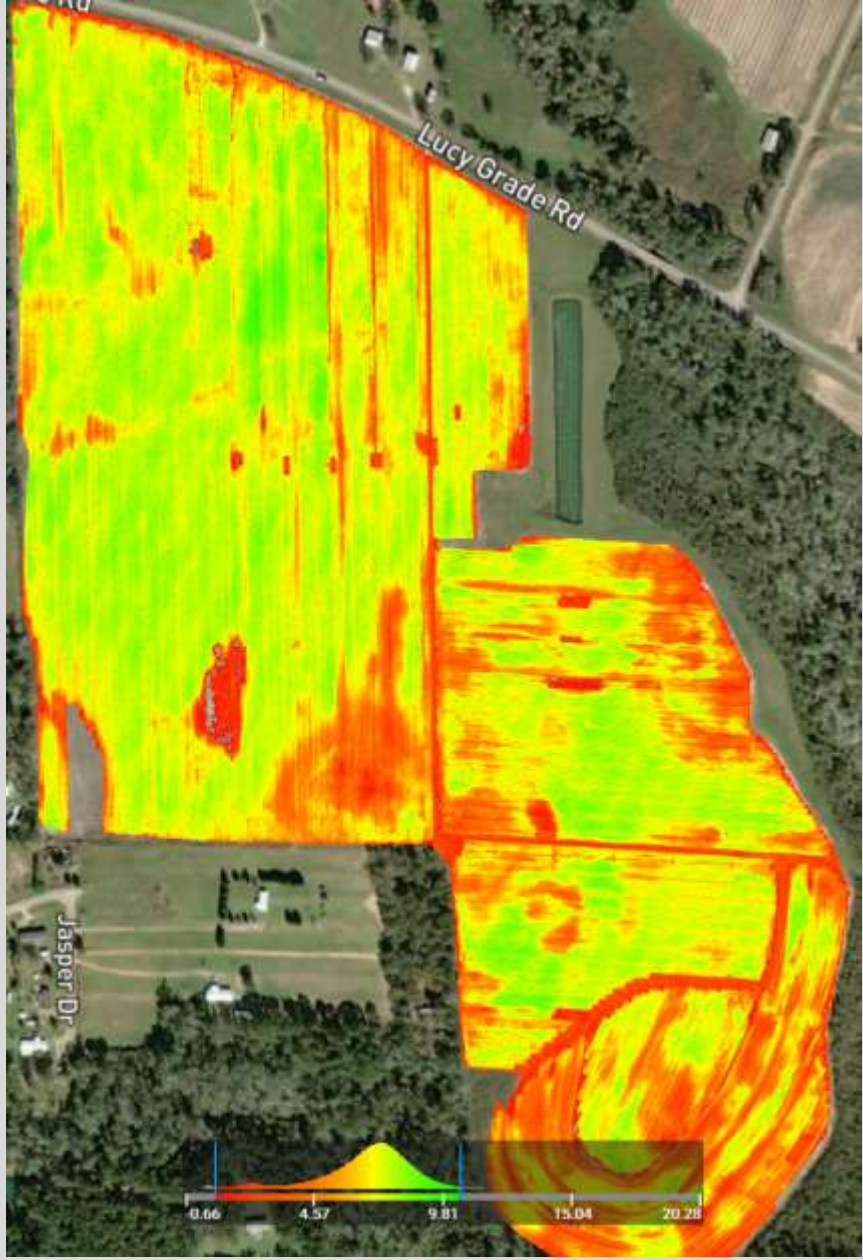

-0.29
6.68
13.64
20.61
27.58
50 ft



July 16, 2021



Aug 11, 2021



Aug 26, 2021

Sep 10, 2021

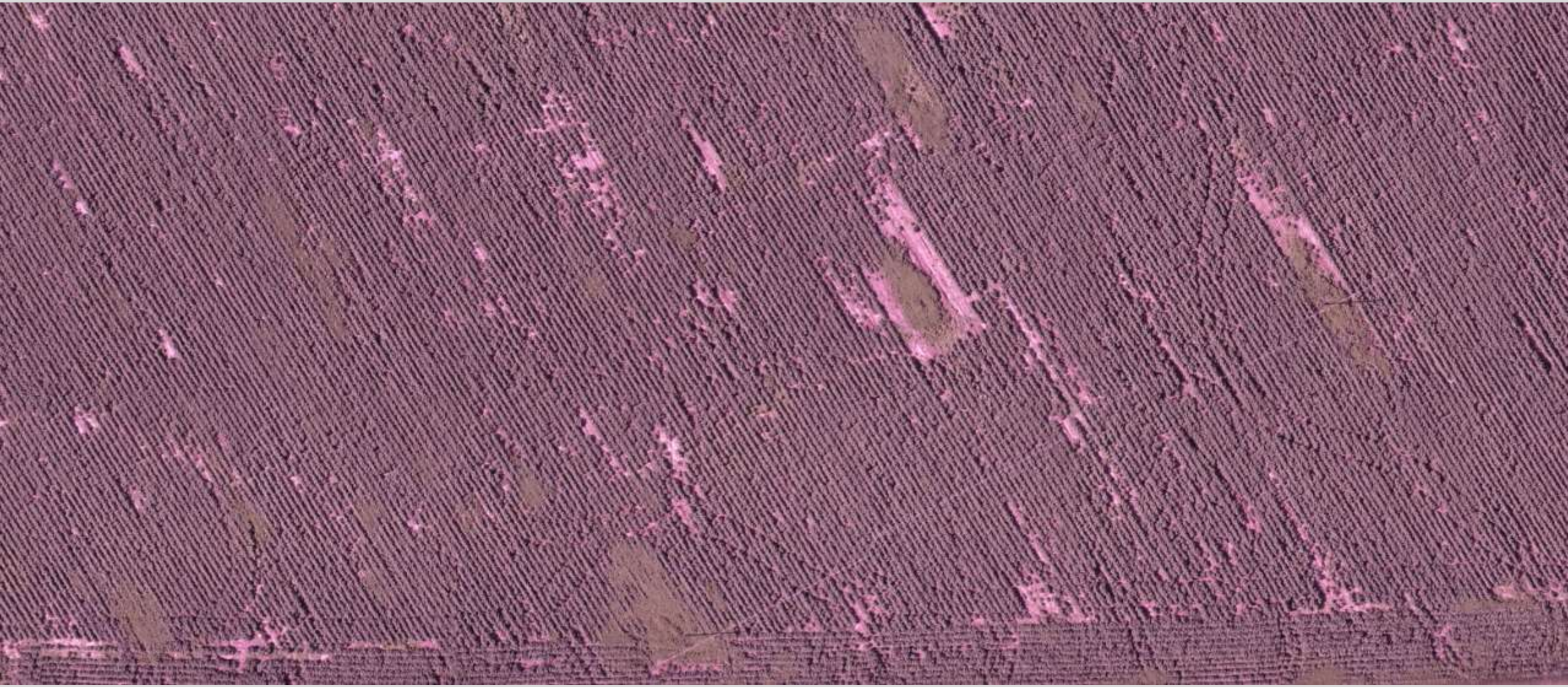
Sep 20, 2021

Oct 4, 2021

Commerical cotton field, 39 acre, Lee county. July 28 2021

DP 2055 and 1646
Grower used chicken litter, cover crop, strip till and cotton followed peanut this year. Peanut trash was left on the ground

This was a quick flight at low overlap (25%), higher altitude (200 ft) and fast speed (20 MPH), perfect for large field scouting

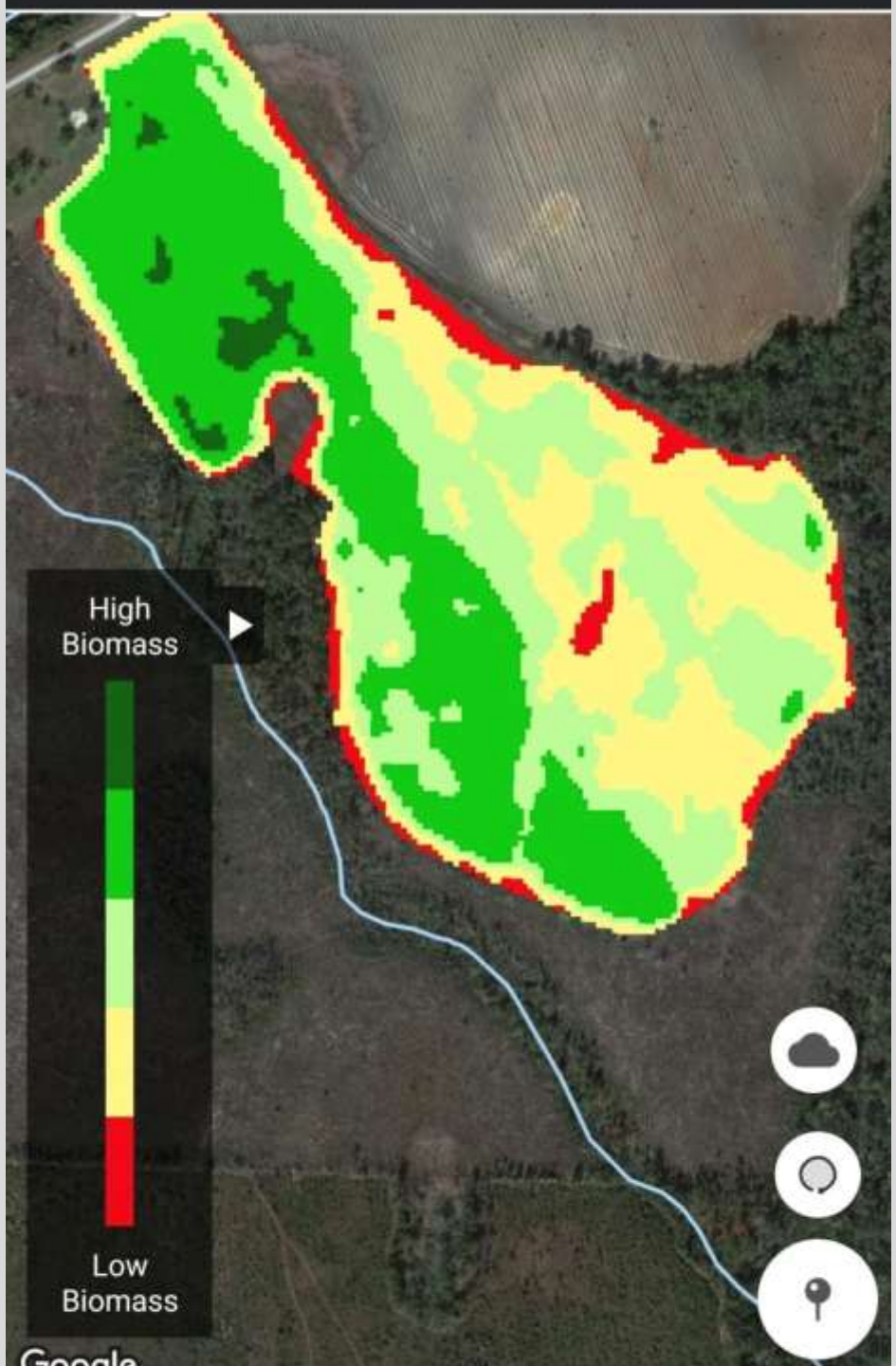


There are decent number of gaps in this field, which makes me wonder if he had a planter issue

Whole field average NDVI was 0.87!!!

There is literally no bad spot which is very rare to see

Nutrient and drainage were controlled very well in this field



GA 06G vs GA 12Y as affected by leaf spot pressure

Clearly showing varietal differences

Picture credit: Caleb Traugh

Field results: UAS-based herbicide appl.

2 GPA
18.5 L ha^{-1}

4 GPA
37 L ha^{-1}

15 GPA
140 L ha^{-1}

Singh, Martin, Bagavathiannan, 2019

VIRGINIA TECH

Questions???

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Thanks for Alabama Cotton Commission for providing funding

Cotton check-off at work!!!