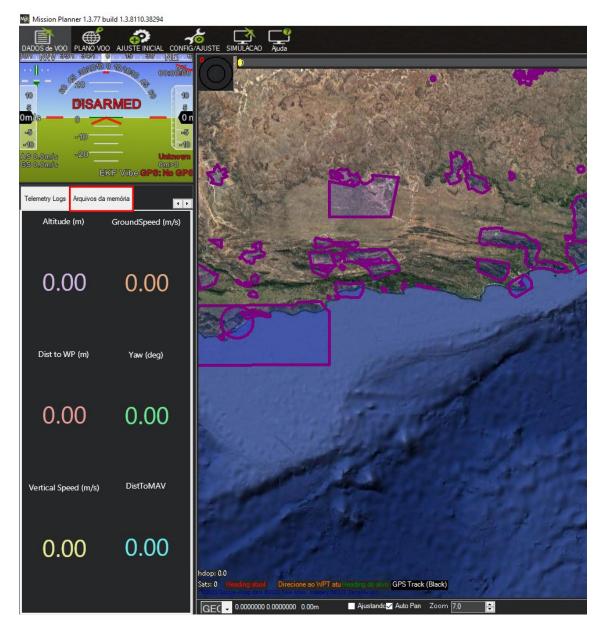
# Processing Agrowing's Multispectral Imagery with Pix4D Fields

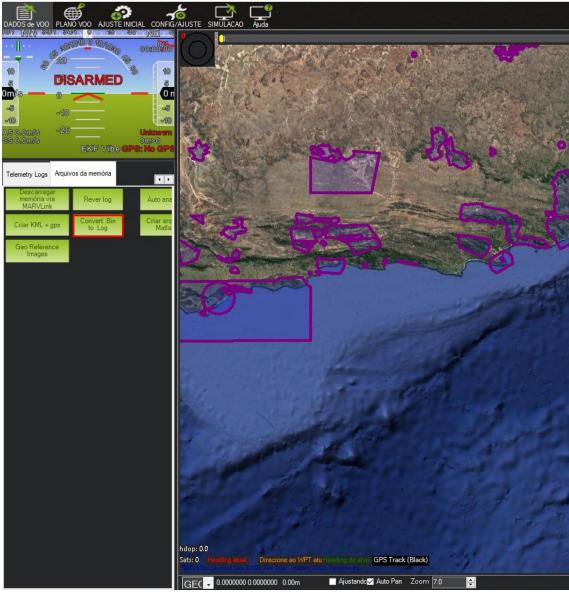
March 2023

The first step of the processing is the convertion of the flight LOG.

The MISSION PLANNER is used for this task.



Look for "memory files" in the Mission Planner and use the option "Convert Bin To "Log". Mission Planner 1.3.77 build 1.3.8110.38294



Locate the LOG in "BIN" and select it

Documentos > TBY_18645 > LOG DE VOO	`	• <mark>с</mark> , р	esquisar em LOG DE VOO
			HI 🔻 🔟 🌔
Nome	Data de modificação	Тіро	Tamanho
2023-02-09 12-19-24.bin	09/02/2023 10:21	Arquivo BIN	19.629 KB
-24.bin		Binary	Log (".biŋ,".BIN)

In the same folder of the "BIN" file the LOG file will appear as a TXT document. The TXT file will be used for Geotagging the acquired imagery (photos) by the "Agrowing Basic" application.

cumentos > TBY_18645 > LOG DE VOO					
Nome	Data de modificação	Тіро	Tamanho		
2023-02-09 12-19-24.bin	09/02/2023 10:21	Arquivo BIN	19.629 KB		
📄 2023-02-09 12-19-24.log	15/03/2023 09:58	Documento de Te	44.002 KB		

After the conversion of the LOG file to a TXT one by the Mission Planner, launch Agrowing's Basic application.



#### In Agrowing Basic go to "GeoRef Images"



Select the folder where the images to be Georeferenced are located and then the Log TXT file location.

😞 Georef images			– 🗆 X
Images folder:			Select folder
<u> </u>			
Output folder:			
GPS Log file:			Load file
		* Currently only text log files supported.	
	GPS Settings File Settings		
	◯ Full Mavlink .log File	GPS only log File	
	GPS file syntax		Log Preview
		Latitude column: 1 🖨	Log Heview
	Column delimiter: tab ~		
		Longitude column: 2	
	GPS data format: Decimal degrees ~	Altitude column: 3 🚖	
		Filename column: 1 🚖	
		Start	Cancel
😔 Georef images			– 🗆 X
		Total files : 727	
Images folder:	C:\Users\Leandro.Mendes\Documents\TBY_18645\Al	RW	Select folder
Output folders	C:\Users\Leandro.Mendes\Documents\TBY_18645\A	DW0	
Output folder:	C. \Users \Leandro.mendes \Documents \1 b1_18645 \A	n w geolagged	
GPS Log file:	C:\Users\Leandro.Mendes\Documents\TBY_18645\LC	DG DE VOO\2023-02-09 12-19-24.log	Load file
		* Currently only text log files supported.	
	GPS Settings File Settings		
	Full Mavlink .log File	◯ GPS only .log File	
	-GPS file syntax		Log Preview
		Latitude column: 1	Log Heview
	Column delimiter: tab $\checkmark$		
		Longitude column: 2 🚖	
	GPS data format: Decimal degrees ~	Altitude column: 3 🚖	
		Filename column: 1 🚖	
	·		
		Start	Cancel

After selecting the two folders, enable the option "Full Mavlink .log File"

## Select the Tab "File Settings"

Georef images			- 🗆 X
		Total files : 727	
Images folder:	C:\Users\Leandro.Mendes\Documents\TBY_18645\A	RW	Select folder
Output folder:	C:\Users\Leandro.Mendes\Documents\TBY_18645\A	ARW\geotagged	
GPS Log file:	C:\Users\Leandro.Mendes\Documents\TBY_18645\L	OG DE VOO\2023-02-09 12-19-24.log	Load file
		* Currently only text log files supported.	
	GPS Settings File Settings		
	Full Mavlink .log File	◯ GPS only .log File	
	GPS file syntax		Log Preview
	Column delimiter: tab 🗸	Latitude column: 1 🚖	Log Preview
		Longitude column: 2 🚖	
	GPS data format: Decimal degrees 🗸	Altitude column: 3	
		Filename column: 1 🚖 🗌	
		Start	Cancel

In the "File Settings" tab clear the option that is marked "Convert RAW" and enable the "Geotag RAW" option.

Click "Start" to start geotagging the images.

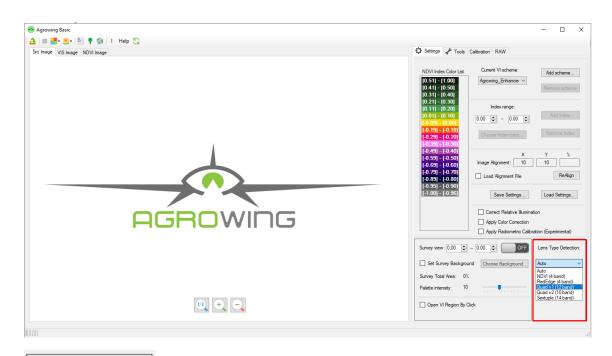
😔 Georef images			-		×
		Total files : 727			
Images folder:	C:\Users\Leandro.Mendes\Documents\TE	3Y_18645\ARW		Select folde	r
Output folder:	C:\Users\Leandro.Mendes\Documents\TE	BY_18645\ARW\geotagged			
GPS Log file:	C:\Users\Leandro.Mendes\Documents\TE	3Y_18645\LOG DE VOO\2023-02-09 12-19-24.log		Load file	
	L	* Currently only text log files supported.			
	GPS Settings File Settings				
	Convert RAW	Raw Options			
		TIFF conversion precision		Log Preview	v
	Geotag RAW	● 8 bpp ○ 16 bpp			
		Auto Gamma Correction			
		Brightness: 1.00 🜩			
		Start		Cancel	
		Start		Cancel	

😔 Georef images			– 🗆 X
		Total files : 727	
Images folder:	C:\Users\Leandro.Mendes\Documents\T	BY_18645\ARW	Select folder
Output folder:	C:\Users\Leandro.Mendes\Documents\7		
GPS Log file:	C:\Users\Leandro.Mendes\Documents\T	TBY_18645\LOG DE VOO\2023-02-09 12-19-24.log	Load file
		* Currently only text log files supported.	
	GPS Settings File Settings		
	Convert RAW	Raw Options	Log Preview
	Geotag RAW	TIFF conversion precision	Log Heview
		8 bpp     16 bpp     16 bpp	
		Auto Gamma Correction	
		Brightness: 1.00 🜩	
		Start	Cancel
😔 Georef images			– 🗆 X
		Total files : 727	
Images folder:	C:\Users\Leandro.Mendes\Documents\	TBY_18645\ARW	Select folder
Output folder:	C:\Users\Leandro.Mendes\Documents\	TBY_18645\ARW\geotagged	
GPS Log file:	C:\Users\Leandro.Mendes\Documents\	TBY_18645\LOG DE VOO\2023-02-09 12-19-24.log	Load file
	51.0 m	* Currently only text log files supported.	
	GPS Settings File Settings		
		Daw Oakiena	
	Convert RAW	Raw Options	Log Preview
	☐ Convert RAW	TIFF conversion precision	Log Preview
			Log Preview
		TIFF conversion precision	Log Preview
		TIFF conversion precision      8 bpp      16 bpp	Log Preview
		TIFF conversion precision 8 bpp 16 bpp Auto Gamma Correction	Log Preview
		TIFF conversion precision 8 bpp 16 bpp Auto Gamma Correction	Log Preview
		TIFF conversion precision 8 bpp 16 bpp Auto Gamma Correction	Log Preview
		TIFF conversion precision 8 bpp 16 bpp Auto Gamma Correction Brightness: 1.00	Log Preview

Once finished close this window.

In the folder where the original images are located a new folder was created named ". ARW\_geotagged". The images in this folder are georeferenced.

To start the imagery processing, the type should be selected first. Click on "Lens Type Detection".

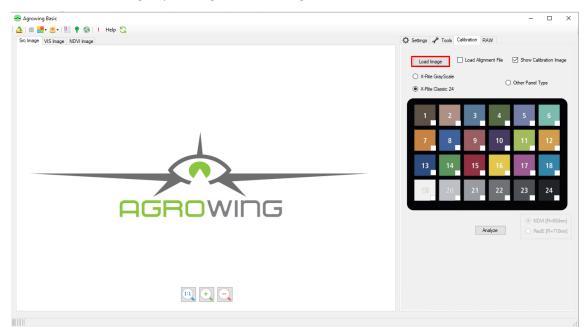


Lens Type Detection:
Quad v1 (12 band) 🗸
Auto NDVI (4 band) RedEdge (4 band) Quad v1 (12 band) Quad v2 (10 band) Sextuple (14 band)



Next, load the image of the calibrating-board in the option "Calibration".

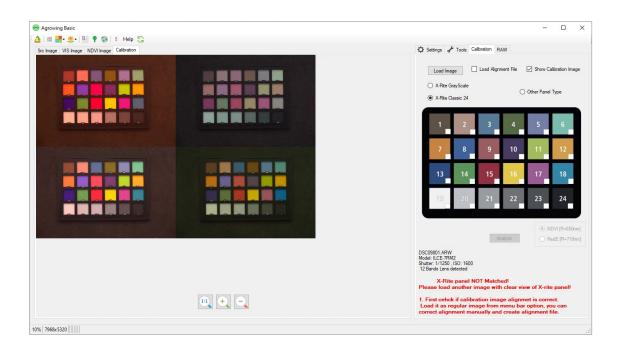
Load the board's image by clicking on "Load Image".

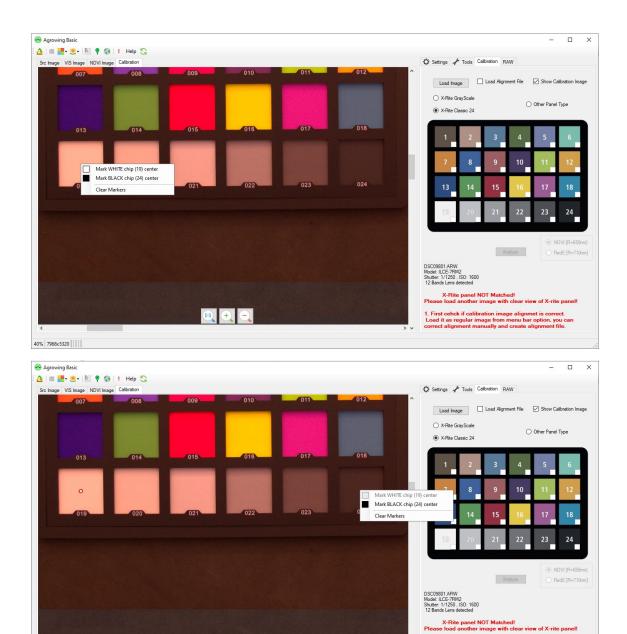


Agrowing Basic	- D >
🛕 📖 🔡 🧶 - 📴 🎈 🎲 🕴 Help 😋	
Src Image VIS Image NDVI Image Calibration	🗘 Settings 🖌 Tools Calibration RAW
	Load Image     Load Alignment File     Show Calibration Image       X-Rite GrayScale     Other Panel Type
	1 2 3 4 5 6
	7 8 9 10 11 12
	13 14 15 16 17 18
	13 20 21 22 23 24
	NDVI (R=650nm)     RedE (R=710nm)
	DSC09801 AFW Model: ILC=7HM2 Souther: 1/1250, ISO-1600 12 Bands Lens detected
0% 7968x5320	

After the board's image was loaded, click on "Analyze".

An error may occur at the end of the calibration analysis. If the error message "X-Rite Panel Not Matched" appears, click on the center of the white square (19) and in the center of the black square (24) and mark with the corresponding options, as shown in the images of the next page.





Arike panel NOT Matchedl Please load another image with clear view of X-rite panel 1. First cehk clear view of X

Agrowing Basic	Help 🛜					- 0
c Image VIS Image NDVI Imag						Settings 🖋 Tools Calibration RAW
007	008	009	010	011	012	Load Image Load Algoment File Show Calibration     X-Rite GrayScale Other Panel Type
013	014	015	016	017	018	• X-Ric Classo 24     1     2     3     4     5     6
o					٩	7 8 9 10 11 12
019	020	021	022	023	024	13         14         15         16         17         18           13         20         21         22         23         24
						NDVI [R-     NDVI [R-     O Redd [R-
						DSC09001 ARW Model: ILCE-7RM2 Shutter: 1/1250, ISO 1600 12 Bands Lens detected
		11				X-Rite panel NOT Matched! Please load another image with clear view of X-rite pane 1. First eehck if calibration image alignmet is correct. Load it as regular image from menu bar option, you car correct alignment manuality and create alignment file
7968x5320						> v correct alignment manually and create alignment file.

### Click again on "Analyze".

S Agrowing Basic	- 🗆 X
A M A A A A A A A A A A A A A A A A A A	🗘 Settings 🖌 Tools Calibration RAW
	Load Image Calbration Image XRts GrayScale
<u>15 20 21 22 28 28</u>	7 8 9 10 11 12
019 020 021 022 023 024	13         14         15         16         17         18           100         20         21         22         23         24
	DSC09801 ARW Model, ILCE-7RM2 Snutter: 1/125, JSO: 1600 12 Bands Lens detected
<ul> <li>(1)</li> <li>(2)</li> <li>(3)</li> <li>(4)</li> <li>(4)</li> <li>(5)</li> <li>(5)</li></ul>	X-Rite panel matched auccessfully!
40%   7968x5320	

The message "X-Rite Panel Matched Successfully!" verifies that the calibration has been performed successfully.

😽 Agrowing Basic	-	
🛕 📾 🚟• 😎 🛯 🔮 🚱 🗉 Help 😋		
Src Image VIS Image NDVI Image Calibration	🌣 Settings 📌 Tools Calibration RAW	
	[0.51] - [1.00] [0.41] - [0.50] [0.31] - [0.40]	Id scheme
	[-0.09] - [0.00] [-0.19] - [-0.10] [-0.29] - [-0.20] Choose Index color Re	Add Index
	[ 0. 39] [ 0. 30] [ 0. 49] - [ 0. 40] [ 0. 59] - [ 0. 50] [ 0. 59] - [ 0. 50] [ 0. 59] - [ 0. 70] [ 0. 59] - [ 0. 90]	%
		ed Settings
		Type Detection: /1 (12 band) ~
	Survey Total Area: 0% Palette intensity: 10	load Image
	Open VI Region By Click	
10%   7968x5320		

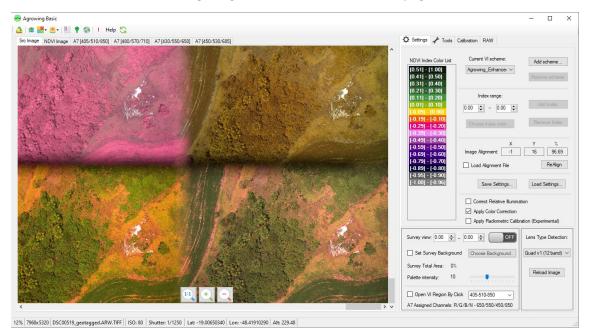
Return to the "Settings" tab and enable the "Apply Color Correction" option.

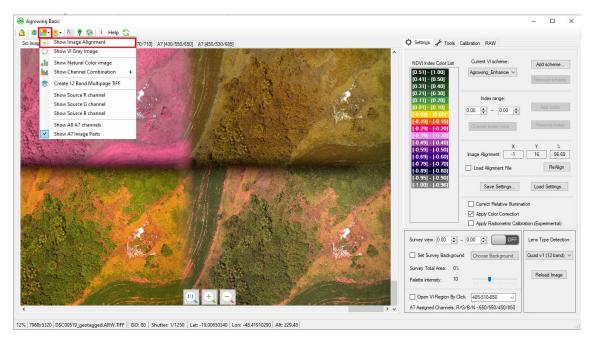
Upload the first image of the folder that has been Georeferenced in "ARW geotagged".

			– 🗆 🗙
🛕 🕮 🔡 • 🧶 • 🔠 🕈 🎲 ! Help 😋			
Mage VIS Image NDVI Image Calibration	Settings 🦨 Tools C	alibration RAW	
	NDVI Index Color List (0.51) - (1.00) (0.41) - (0.50) (0.31) - (0.40)	Current VI scheme: Agrowing_Enhancer ~	Add scheme Remove scheme
	(0, 21) - (0, 30) (0, 11) - (0, 29) (0, 01) - (0, 19) (-0, 19) - (0, 10) (-0, 19) - (-0, 10) (-0, 29) - (-0, 20) (-0, 29) - (-0, 20)	Index range: 0.00 = 0.00 = Choose Index color	Add Index Remove Index
	$\begin{bmatrix} 0 & 33 & -10 & 40 \\ 0 & 43 & -10 & 40 \\ 0 & 53 & -10 & 50 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & 50 & -10 & -10 \\ -10 & -10 & -10 & -10 \\ -1$	X Image Alignment: 10 Load Alignment File	Y %
	[0.33] = [0.36] [-1.00] - [0.36]	Save Settings  Correct Relative Illuminat Apply Color Correction Apply Radiometric Calibra	
	Survey view: 0.00 (a) Set Survey Backgroun Survey Total Area: 0%		Lens Type Detection: Quad v1 (12 band) ~
	Palette intensity: 10	ck	Reload Image
10% 7968x5320			

								<b>•</b> •
Print Print		10						
DSC00519_geota gged.ARW	DSC00520_geota gged.ARW	DSC00521_geota gged.ARW	DSC00522_geota gged.ARW	DSC00523_geota gged.ARW	DSC00524_geota gged.ARW	DSC00525_geota gged.ARW	DSC00526_geota gged.ARW	DSC00527_geo gged.ARW
100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100						100 100		
DSC00528_geota gged.ARW	DSC00529_geota gged.ARW	DSC00530_geota gged.ARW	DSC00531_geota gged.ARW	DSC00532_geota gged.ARW	DSC00533_geota gged.ARW	DSC00534_geota gged.ARW	DSC00535_geota gged.ARW	DSC00536_geo gged.ARW
A A								Alle H
DSC00537_geota gged.ARW	DSC00538_geota gged.ARW	DSC00539_geota gged.ARW	DSC00540_geota gged.ARW	DSC00541_geota gged.ARW	DSC00542_geota gged.ARW	DSC00543_geota gged.ARW	DSC00544_geota gged.ARW	DSC00545_geo gged.ARW
and the second second	APR APR	Real Providence						
DSC00546_geota gged.ARW	DSC00547_geota gged.ARW	DSC00548_geota gged.ARW	DSC00549_geota gged.ARW	DSC00550_geota gged.ARW	DSC00551_geota gged.ARW	DSC00552_geota gged.ARW	DSC00553_geota gged.ARW	DSC00554_geo gged.ARW
		<b>11</b> 1			m let		17/17/2	1.2 1.2
DSC00555_geota gged.ARW	DSC00556_geota gged.ARW	DSC00557_geota gged.ARW	DSC00558_geota gged.ARW	DSC00559_geota gged.ARW	DSC00560_geota gged.ARW	DSC00561_geota gged.ARW	DSC00562_geota gged.ARW	DSC00563_geo gged.ARW
1.41.00		19. 19. je	No. 12				Ver a france	
DSC00564_geota gged.ARW	DSC00565_geota gged.ARW	DSC00566_geota gged.ARW	DSC00567_geota gged.ARW	DSC00568_geota gged.ARW	DSC00569_geota gged.ARW	DSC00570_geota gged.ARW	DSC00571_geota gged.ARW	DSC00572_geot gged.ARW
			( a free to					

After the image loaded perform the bands alignment by clicking on the option "Show RGB Channels" and then "Show Image Alignment" as seen on the next page.



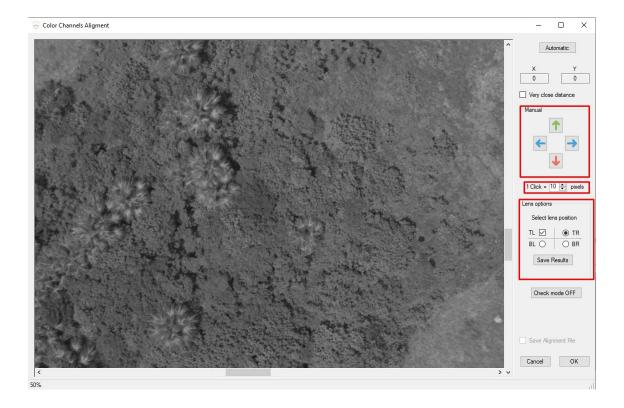




Check the alignment by identifying a distinctive point in the image and use the arrows to move the quadrants' images for optimal overlapping.

Set the number of pixels for with each Click. (Final alignment should be done using 1 Pixel).

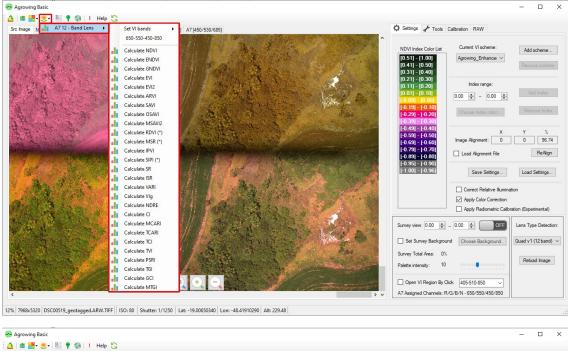
In "Lens Options" check and align each of the options "TR" – "BR" – "BL". With every single check and alignment the alignment must be saved by clicking on "Save Results"

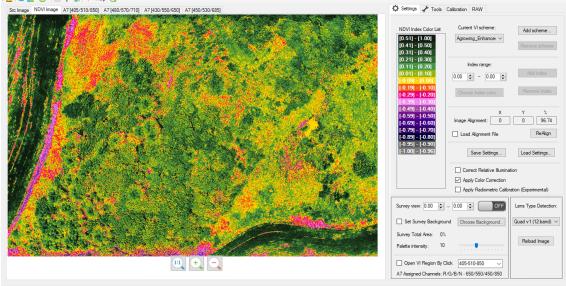


😔 Color Channels Aligment × Automatic 1 Click = 1 🜩 pixels Select lens position BL ( Save Results Results saved! Check mode OFF 95.87% Save Alignment File Cancel OK 400%

Once all the 4 quadrants were aligned, click on "Save Alignment File" and then click on OK.

Select and apply an index of your choice from the supported vegetation indices. Click on "Calculate Vegetation Index", then on "Band Lens", and select some index for the boards activation.





25% 3572x2336 DSC00519\_geotagged.ARW.TIFF GNDVI ISO: 80 Shutter: 1/1250 Lat: -19.00650340 Lon: -48.41910290 Alt: 229.48

To process all the mission's images, use the "Batch Runner". After opening the window configure the options in the following order.

Se Agrowing Basic		- 🗆 X
🛕 🛤 🔡 🍨 📕 🕈 🔗 Agrowing Batch Runner	- 🗆 🗙	
Src Image NDVI Image Av [		🗘 Settings 📌 Tools Calibration RAW
Source folder: Bach Settings AFSC - 4 bandsFurgere - 12 bands	Open Folder	NDVI Index Color List Current VI scheme: Add scheme
□-□Save Image Parts	Common Settings	[0.21] - [0.30]
Save VIS image Color Adjusted	Process images Process video	[0, 11] - [0, 20] [0, 01] - [0, 10] [-0, 09] - [0, 00] 0.00 ♀ - 0.00 ♀ Add Index
Save Blue+Green+NIR combination	Allign aerial images     Allign aerial by image point     Allign aerial by first image     X     Y	[-0.19] - [-0.10] [-0.29] - [-0.20] [-0.39] - [-0.30]
Save Color Bands	Align ground images     0     0	X         Y         %           [-0.59] - [-0.50]         Image Alignment:         0         96.74
	Save in separate folders  Downsample images  2x2  4x4	[-0.79] - [-0.70] [-0.89] - [-0.80] [-0.95] - [-0.90]
Save Bands As Multi-Page TIFF	Max PC load: 10 v cpu	[-1.00] - [-0.96] Save Settings Load Settings
	Apply Radiometric Calibration (Experimental)	Correct Relative Illumination
	Correct Relative Illumination	Apply Color Correction  Apply Radiometric Calibration (Experimental)
		Apply Hadiometric Caloration (Experimental)
A state of	VI & Color Settings	Survey view: 0.00 🐳 - 0.00 🐳 OFF Lens Type Detection:
a characteria	Advanced Settings	Set Survey Background Choose Background Quad v1 (12 band) V
	RAW Options	Survey Total Area: 0%
*Note: GPS data from original image will be saved		Palette intensity: 10 Reload Image
		Open VI Region By Click 405-510-850
	Start Cancel	A7 Assigned Channels: R/G/B/N - 650/550/450/850

25% 3572x2336 DSC00519\_geotagged.ARW.TIFF GNDVI ISO: 80 Shutter: 1/1250 Lat: -19.00650340 Lon: -48.41910290 Alt: 229.48

First, locate and select the folder where the Geotagged images are located.

Source folder:	Open Folder
Batch Settings APS-C - 4 bands FullFrame - 12 bands	
Save Image Parts	Common Settings
	Process images Process video 1 + fps
Save Blue+Green+NIR combination     Save Red+Green+NIR combination	Allign aerial images     Allign aerial by image point
Save Red+Blue+NIR combination	Allign aerial by first image X Y
Bave Color Bands Bave 450 nm image	O Allign ground images
	Save in separate folders Downsample images
Save 650/710 nm image Save 850 nm image	
Save Bands As Multi-Page TIFF	Max PC load: 10 v cpu
Save 4 Bands As One-Page TIFF ⊕ □ Save Vegetation Indexes	
	Apply Radiometric Calibration (Experimental)
	Correct Relative Illumination
	VI & Color Settings
	Advanced Settings
	RAW Options
*Note: GPS data from original image will be saved	

ource folder: Batch Settings APS-C - 4 bands FullFrame - 12 bands	Open Folder Scan recursive
Save Image Parts     Save VIS image Color Adjusted     Save VIS image     Save VIS image     Save NIR image     Save Blue+Green+NIR combination     Save Red+Green+NIR combination	Common Settings  Process images  Process video  fps  Procurar Pasta  X
<ul> <li>Save Red+Blue+NIR combination</li> <li>Save Color Bands</li> <li>Save 450 nm image</li> <li>Save 550 nm image</li> <li>Save 650/710 nm image</li> <li>Save 850 nm image</li> <li>Save 850 nm image</li> <li>Save 850 nm image</li> <li>Save 4 Bands As Multi-Page TIFF</li> <li>Save 4 Bands As One-Page TIFF</li> <li>Save Vegetation Indexes</li> </ul>	O   Imagens   >   >   Ma   ✓   Ma   ✓   ARW   ✓   geotagged   ✓   ARW_geotagged   ✓   ARW_geotagged   ✓   ARW_geotagged   ✓   ARW_geotagged   ✓   ARW_geotagged   ✓   ✓   ARW_geotagged   ✓   ✓   ARW_geotagged   ✓   ✓   Arwork   ✓   Downloads   ✓   ✓   Øbjetos 3D   ✓   OK   Cancelar

Verify (lower left corner) that the images were uploaded and the total uploaded number of the images matches the mission's number of images.

	TBY_18645\ARW\geotagged\.ARW_geotagg Open Folder Scan recursive
Batch Settings APS-C - 4 bands FullFrame - 12 bands	
Save Image Parts	Common Settings
Save 405-510-850 Part Save 450-530-685 Part Save 430-550-650 Part	Process images Process video 1 + fps
Save 480-570-710 Part	Align aerial images     Align by loaded image
⊡ Save Color Bands Save 405 nm image	O Allign ground images
	Save in separate folders Downsample images
	Max PC load: 10 v cpu
Save 550 nm image Save 570 nm image Save 650 nm image	TIFF Compression: LZW ~
	Add Pix4D XMP Tags
<mark></mark>	Correct Relative Illumination
Save Selected As JPEG Greyscale	Apply Radiometric Calibration (Experimental)
Save Band Combination	VI & Color Settings
Save Vegetation Index	RAW Options
*Note: GPS data from original image will be saved	

In the "Common Settings" tab we change some of the options as follows:

- Enable the "Align by loaded image" option.
- In "Max PC load" set the number of cores to be used for the processing.
- Enable the option "Add Pix4d XMP Tags".
- Enable the "Apply Radiometric Calibration" option.

Agrowing Batch Runner	– 🗆 X
Source folder: C:\Users\Leandro.Mendes\Documents\TB	Y_18645\ARW\geotagged\.ARW_geotagg Open Folder
Batch Settings	Scan recursive
APS-C - 4 bands FullFrame - 12 bands	
🖃 🛄 Save Image Parts	Common Settings
	Process images Process video 1 🖨 fps
Save 480-570-710 Part ⊡⊡Save Color Bands	Align aerial images I Align by loaded image
	O Allign ground images
	Save in separate folders Downsample images
	Max PC load: 4 v cpu
Save 550 nm image Save 570 nm image	TIFF Compression: LZW ~
Save 650 nm image Save 685 nm image	Add Pix4D XMP Tags
	Correct Relative Illumination
Save Selected As Multi-Page TIFF Save Selected As JPEG Greyscale Save Selected As TIFF Greyscale	Apply Radiometric Calibration (Experimental)
Save Band Combination	VI & Color Settings
	RAW Options
*Note: GPS data from original image will be saved	
Total files : 727	Start Cancel

Right-click on "Save Band Combination" to generate the combinations of bands that will be processed.

18645\ARW\geotagged\ARW_geotag; Open Folder	
Scan recursive	
Common Settings	
Process images Process video	ps
Align aerial images     Align by loaded image     Align aerial images	
Save in separate folders Downsample images	
Max PC load: 4 v cpu 2x2 4x4	
TIFF Compression:	
Add Pix4D XMP Tags	
Correct Relative Illumination	
Apply Radiometric Calibration (Experimental)	
ombination (3 Bands)	
	1
550 -	
450 -	
	<ul> <li>Align aerial images</li> <li>Align ground images</li> <li>Align ground images</li> <li>Save in separate folders</li> <li>Downsample images</li> <li>2x2</li> <li>4x4</li> <li>TIFF Compression:</li> <li>LZW</li> <li>Add Pix4D XMP Tags</li> <li>Correct Relative Illumination</li> <li>Apply Radiometric Calibration (Experimental)</li> <li>F Combination (3 Bands)</li> <li>T10</li> <li>550</li> </ul>

urce folder: C:\Users\Leandro.Mendes\Documents\	TBY_18645\ARW\geotagged\.ARW_geotags Open Folder
	Scan recursive
atch Settings	
PS-C - 4 bands FullFrame - 12 bands	
	Common Settings
Save 430-550-650 Part	Process images Process video
-Save Color Bands	Align aerial images     Align by loaded image
- Save 430 nm image - Save 450 nm image - Save 480 nm image	O Allign ground images
	Save in separate folders Downsample images
	Max PC load: 4 v cpu 2x2 4x4
	TIFF Compression: LZW ~
- Save 710 nm image - Save 850 nm image - Save Selected As Multi-Page TIFF	Add Pix4D XMP Tags
	Correct Relative Illumination
Save Selected As TIFF Greyscale     Save Band Combination     [710 - 550 - 450 - 850 ] - TIFF	Apply Radiometric Calibration (Experimental)
0 [ 650 - 550 - 450 - 850 ] - TIFF	VI & Color Settings
Save Vegetation Index	RAW Options
lote: GPS data from original image will be saved	

Once you have selected all the settings, click on "Start".

Once the processing is finished, the new images will be saved in a new subfolder within the "folder." ARW\_geotagged".

			0.54			
Source folder:	C:\Users\Leandro.Mendes\Documents\	TBY_18645\ARW\geotagged\ARW_geotagg	Open Folder			
Batch Setting			Scan recursive			
APS-C - 4 bar	nds FullFrame - 12 bands					
	ave 450-530-685 Part	Common Settings				
- Save 430-550-650 Part - Save 480-570-710 Part - Save Color Bands - Save 405 nm image - Save 430 nm image - Save 450 nm image - Save 480 nm image - Save 510 nm image		Process images Proce	ess video 1 🗘 fps			
		Align aerial images     Align ground images	ign by loaded image			
			sample images			
-Save 530 nm image -Save 550 nm image -Save 570 nm image	Max PC load: 4 v cpu	2x2 4x4				
	ave 650 nm image ave 685 nm image ave 710 nm image	TIFF Compression: LZW	-			
-05	ave 850 nm image ave 850 nm image ave Selected As Multi-Page TIFF	Add Pix4D XMP Tags				
Save Selected As JPEG Greyscale		Correct Relative Illumination Apply Radiometric Calibration (Experimental)				
	710 - 550 - 450 - 850 ] - TIFF 550 - 550 - 450 - 850 ] - TIFF	VI & Color Settings				
Save	Vegetation Index	<ul> <li>RAW Options</li> </ul>				
"Note: GPS d	ata from original image will be saved					

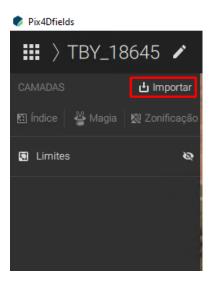
In "Pix4d Fields" (lower right corner) look for the Icon 🕒 and open a New project.

	5 Fra4Utheids		=	 ~
	PIX4Dfields	Todos os projetos $\checkmark$	Ordenar por data de modificação 🗸	۵
	EXEMPLOS			
	Exemplo RGB Exemplo Active de diados usando S.C.D.A com else Acua Exercisão de compunto de diados usando S.C.D.A Exercisão de compunto de diados usando S.C.D.A Exercisão de compunto de diados usando S.C.D.A			
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Rename the Project.

Pix4Dfields				- σ ×
		Renomear projeto		
		TBY_18645		
			Cancelar Salvar	
		er: 1		

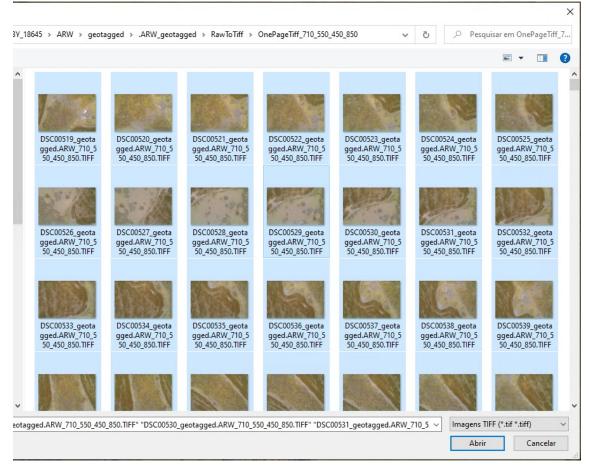
To upload the images, click on "Import".



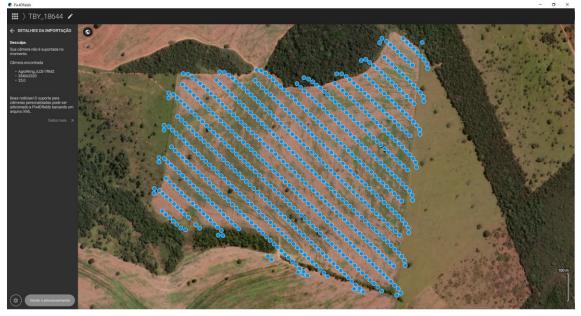
Then click on "images" and find the location where the images were saved.

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		TBY_18645 🖍	
×	IMPO	RTAR ARQUIVOS	0
	*,	Dados de satélite	
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	<b>*</b> ∎*	Capturado por drone	1. A. A.
	L	Imagens .tif .tiff .jpg .jpeg	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
		Pasta .tif .tiff .jpg .jpeg	
127		Saiba mais 🏼 🛪	1.9.2
	8	Outro mapa:	
		GeoTIFF	
		Aif Aiff	

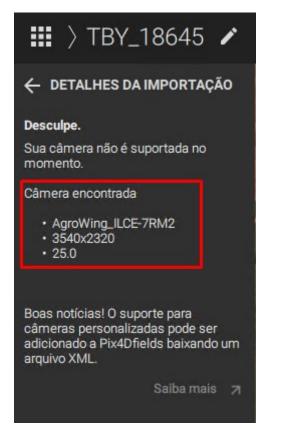
#### Upload all images.



If the error message "Your camera is not currently supported" appears, you will not be able to process the images before solving the issue as describes on the next page.



To resolve "Your camera is not currently supported" it is necessary to mount an XML file which includes the camera specifications and measurements.



VETORGEO\_CONFIGURATION\_OF\_AGROWING\_SENSOR\_3.xml - Bloco de Notas
 Arquivo Editar Formatar Exibir Ajuda

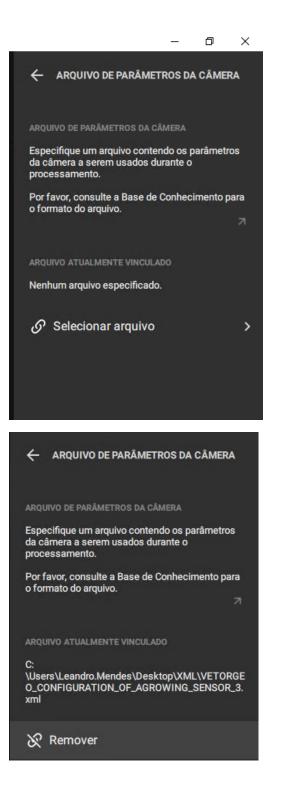
<band name="NIR" centralWaveLength="860" width="20" weight="1"/> </bandConfig> </camera> <camera name="AgroWing\_ILCE-7RM2\_25.0\_3540x2320"> <imageWidth>3540</imageWidth> <imageHeight>2320</imageHeight> <pixelSize>4.514588</pixelSize> <principalPointXmm>7.99082</principalPointXmm> <principalPointYmm>5.236922</principalPointYmm> <lensType>perspective</lensType> <focalLengthmm>25</focalLengthmm> <distortion>5</distortion> <radialK1>0</radialK1> <radialK2>0</radialK2> <radialK3>0</radialK3> <tangentialT1>0</tangentialT1> <tangentialT2>0</tangentialT2> <cameraModelSource>exif</cameraModelSource> <bandConfig> <band name="Red" centralWaveLength="660" width="20" weight="1"/> <band name="Green" centralWaveLength="570" width="20" weight="1"/>
<band name="Blue" centralWaveLength="430" width="20" weight="1"/> <band name="NIR" centralWaveLength="860" width="20" weight="1"/> </bandConfig>

After the XML File is generated with all the necessary information, click on the settings button (top right) of the initial screen PIX4D Fields.



Select "Camera Parameters File" and load the XML that was created.

	-	đ	$\times$
CONFIGURAÇÕES			×
CONFIGURAÇÕES DO APP			
Unidades		Métrica	>
ldioma	Portuguê	s, Brazil	>
Mapa de base		Padrão	>
Personalizar relatór	io PDF		>
MANIPULAÇÃO DE DADOS			
Pasta de armazena	mento de	dados	>
Arquivo de parâme	tros da câi	mera	>
Gerenciar licenças			7
Sair			
MAIS			
Jurídico			>
Reconhecimentos			>

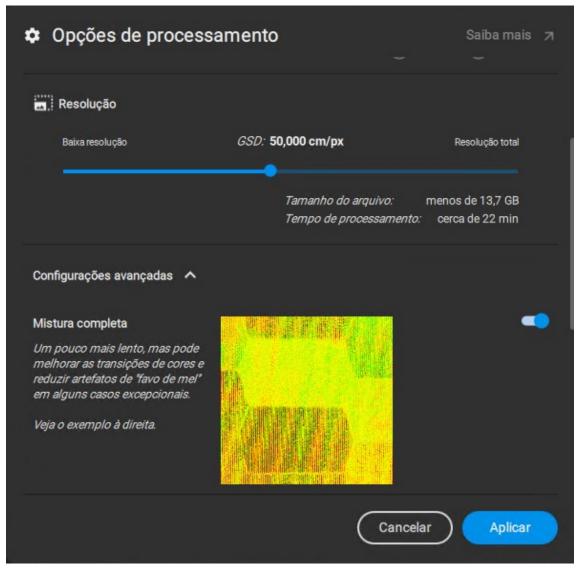


The images import will be repeated without the error.

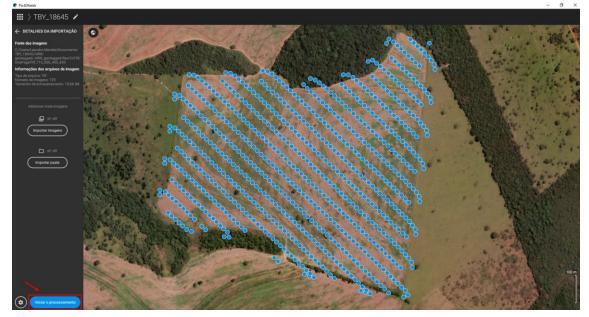
🔮 Pix4Dfields	-	o ×
₩ > TBY_18645 🕜		
← DETALHES DA IMPORTAÇÃO		1.00
Fonte das imagens		
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Informações dos arquivos de Imagem		6
Tura de supério 125		
Terrenha de arritanezarado 11.59 (5)	Opções de processamento     Saiba mais 71	
	Processamento rápido     Processamento preciso     NOVO	1.1
Advantational seaples	Resultados rápidos. Bom ortomosaico Ontomosaico preciso e modelo de altura	
	e modelo de altura simplificado. detalhado.	
	Ideal para: Resultados em campo para Ideal para: Medições, campos de teste, aplicações de parulhamento e taxa aplicações pontusis, análise de elevação	
(Importar imagens)		
		1 6.00
	Resolucio	
Importar pasta		1.4 6.6
	Beira medugalo GSD: <b>liimitado</b> Resolução total	
20, 0, 0,	Tamanho do arguivo: menos de 13.7 GB Tempo de processemento: cerca de 22 min	
	tempo de processamento: cerca se zz min	
	Configurações avançadas 🗸	
	Cancelar Aplicar	
		-
		100 m
(     Iniciar o processamento'		

In the processing options change the size of the GSD and in thr advanced settings the option "Full Mix".

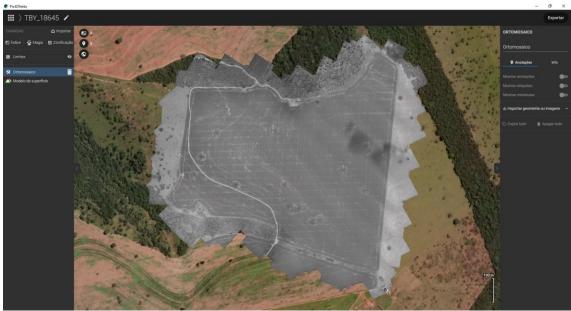
Opções de processamento	Saiba mais 🦻
Processamento rápido	Processamento preciso NOVO
Resultados rápidos. Bom ortomosaico e modelo de altura simplificado. Ideal para: Resultados em campo para aplicações de patrulhamento e taxa variável	Ortomosaico preciso e modelo de altura detalhado. Ideal para: Medições, campos de teste, aplicações pontuais, análise de elevação
Condições climatéricas durante a captura	🔿 Nublado 🔿 Céu limpo
Baixa resolução GSD.	ilimitado Resolução total
	Tamanho do arquivo: menos de 13,7 GB Tempo de processamento: cerca de 22 min
Configurações avançadas  ۸	
	Cancelar Aplicar



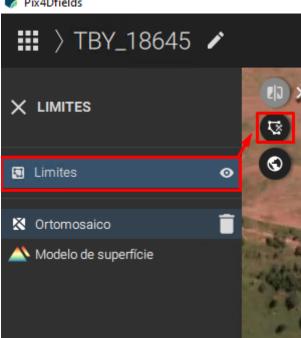
After performing the necessary settings click on "Apply" and then "Start Processing".



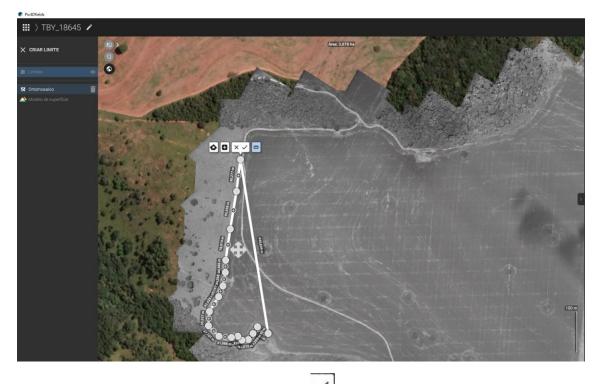
The full mosaic can be used or a limited area of interest. To define a limited area select "Limits".



With the "Limits" option enabled, select the "Draw Limit" tool and start marking the desired area.



Pix4Dfields



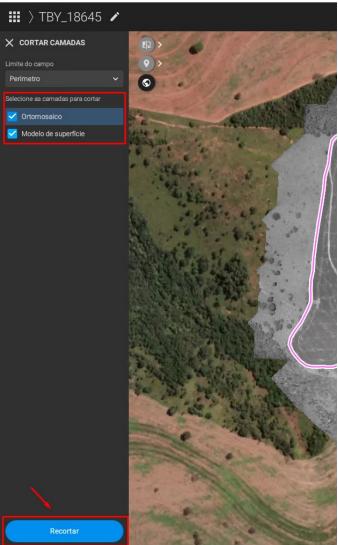
After the area limits are marked click on the icon 🖌 to save the limit.



With the "Limits" option still enabled and the desired area limitation saved, cutting and maintaining the desired area can be done by clicking on "Cut".



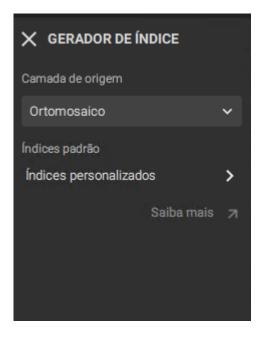
Pix4Dfields



The mosaic ready for the analysis.



To apply an index click on "Indices".

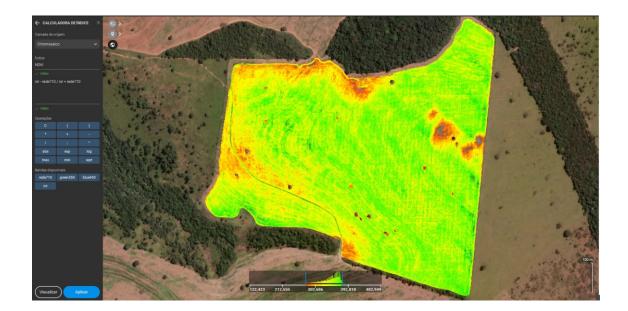


Click on "Custom Indices" and as an example use the NDVI = NIR – RED/ NIR+RED.

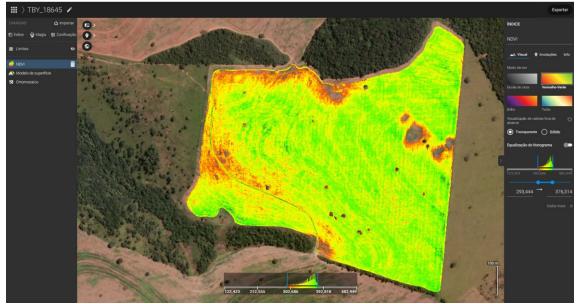
Name and insert the formula according to the available bands (this is just an example), which not NDVI but NDRE, because we have 710 in place of 650.

← CALCULADORA DE ÍNDICE				← CALCULADORA DE ÍNDICE 7			
Camada de origem				Camada de origem			
Ortomosaico 🗸 🗸				Ortomosaico 🗸			
<b>Índice</b> Nomear / carregar índice				Índice NDVI			
× Nome inválido				✓ Válido			
Inserir fórmula				nir - rede710 / nir + rede710			
× Fórmula inválida			~	✓ Válido			
Operações			o	Operações			
С	(	)		С	(	)	
*	+				+		
/				/			
abs	exp	log		abs	exp	log	
max	min	sqrt		max	min	sqrt	
Bandas disponíveis			В	Bandas disponíveis			
rede710	green550	blue450		rede710	green550	blue450	
nir				nir			

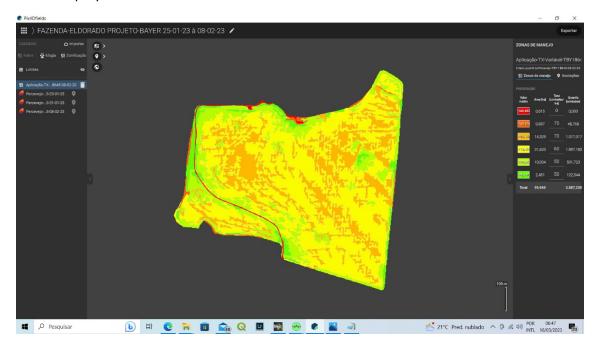
Click "View" to check if the index was applied correctly and then "Apply" (just an example, any index can be used).



On the right side configure the histogram or any other option that the software offers (just an example).



## Insect spraying map example for tractors



Variable spray rate is now available to be used.

For machinery spraying it is possible to output the map in three different file versions

Geojonson

Shape file

Kml

98% of the machinery in Brazil work with shape file format except John Deere's machinery.

John Deere use different file format which could also be used using Agrocad software and script tools.

Please check this usage video file below:



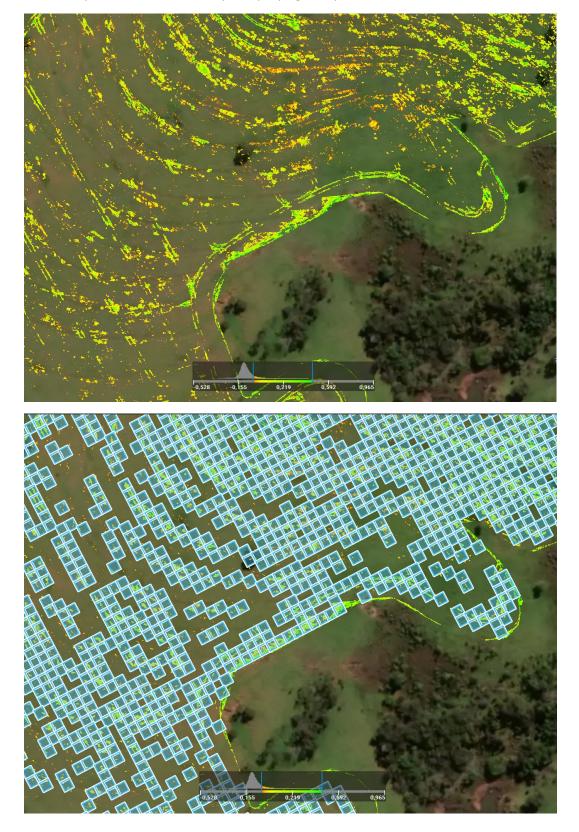
# Weeds Spraying map example using drones

The sensor's high resolution with detector tools in AWbasic enable the detection and isolation of the spectral signature of the Large leaf weed Trapueraba.



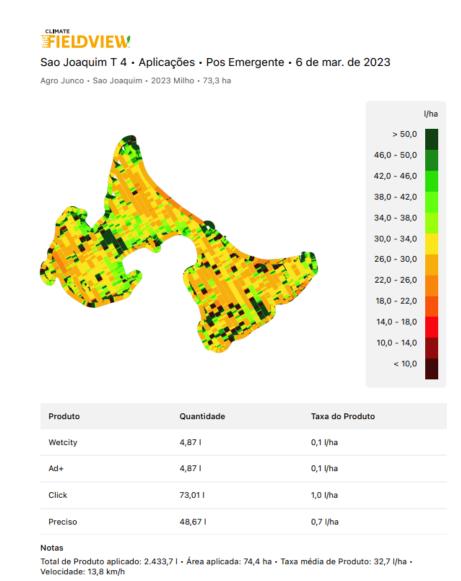
In Barzil this kind of sprayng (Catação) is called focused sprayng.





This example shows 96% accuracy for spraying the specific weed.

The result of VetorGeo's application (Performed and measured by Bayer software Climate field view) is deployed with Machinery.



Página 1

9 de março de 2023