



# Using Normalized Difference Vegetation Index (NDVI) to Monitor Cover Crops

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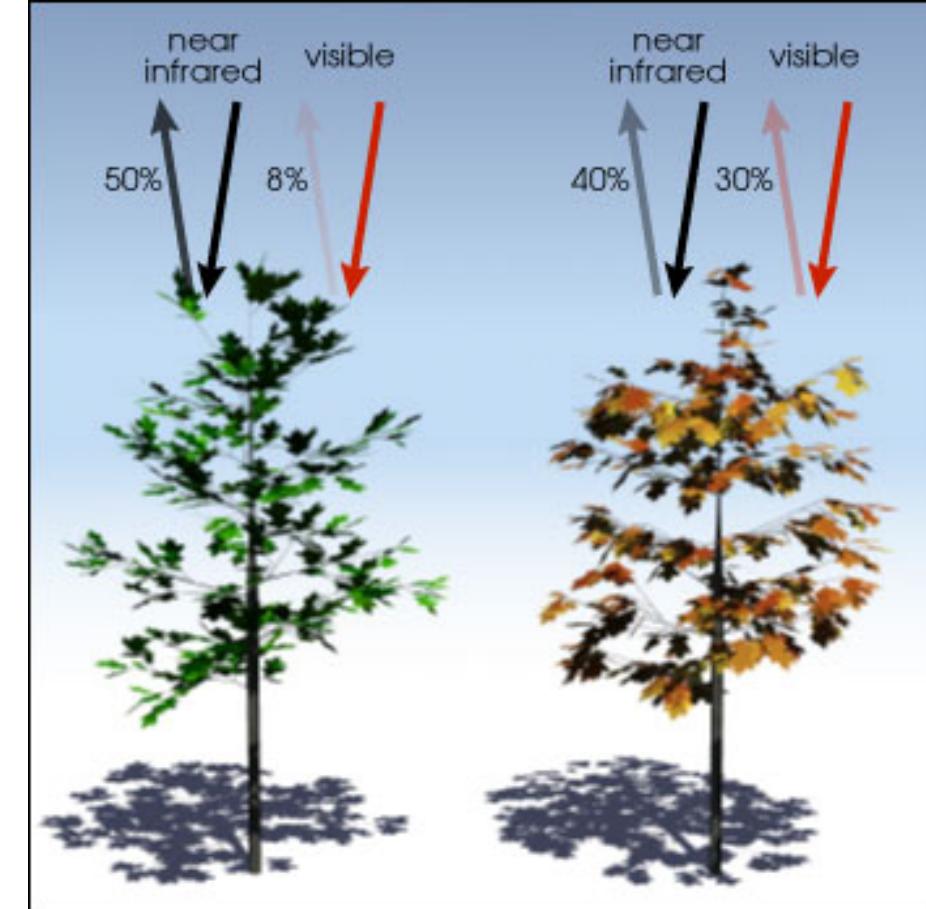
# Cover crops research in the LRGV

- Planted to control soil erosion, fertility, and quality; retain soil moisture; reduce weeds, pests, and disease; and improve biodiversity
- Limited on-farm research of implementation practices (seeding rates, planting, termination, varieties)
- Traditional quantitative sampling techniques over-simplify complex interactions
- Remote sensing can help us understand field level interactions



# What is NDVI?

- Quantifies vegetation by measuring the difference between near-infrared bands (which vegetation strongly reflects) and red bands (which vegetation absorbs).
- $-1 = \text{water}$
- $1 = \text{dense green vegetation}$
- $0 = \text{no vegetation}$
- $NDVI = \frac{Nir - Red}{Nir + Red}$

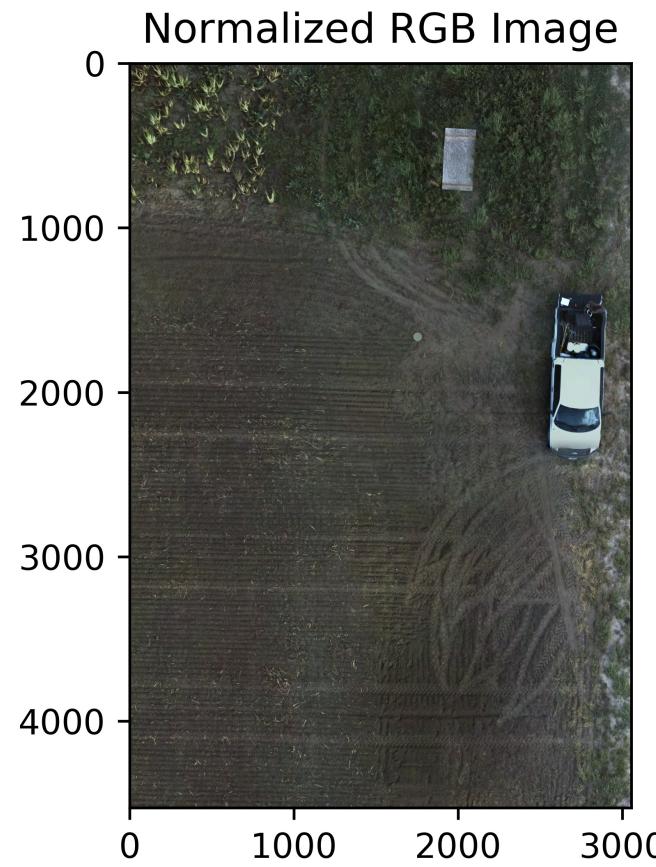
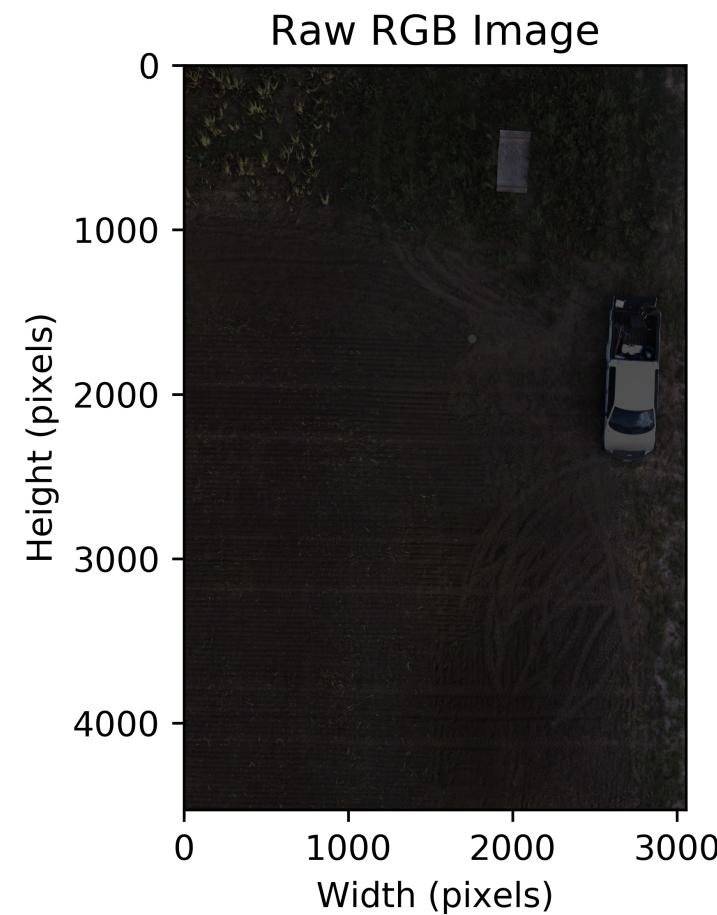


$$\frac{(0.50 - 0.08)}{(0.50 + 0.08)} = 0.72$$

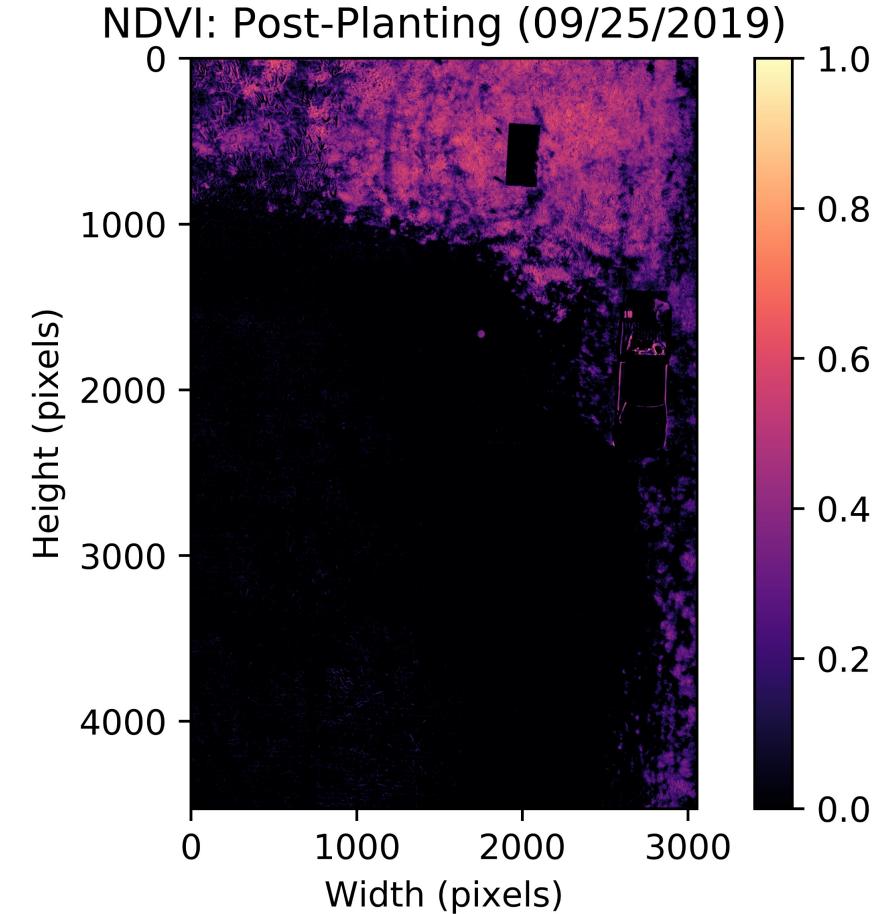
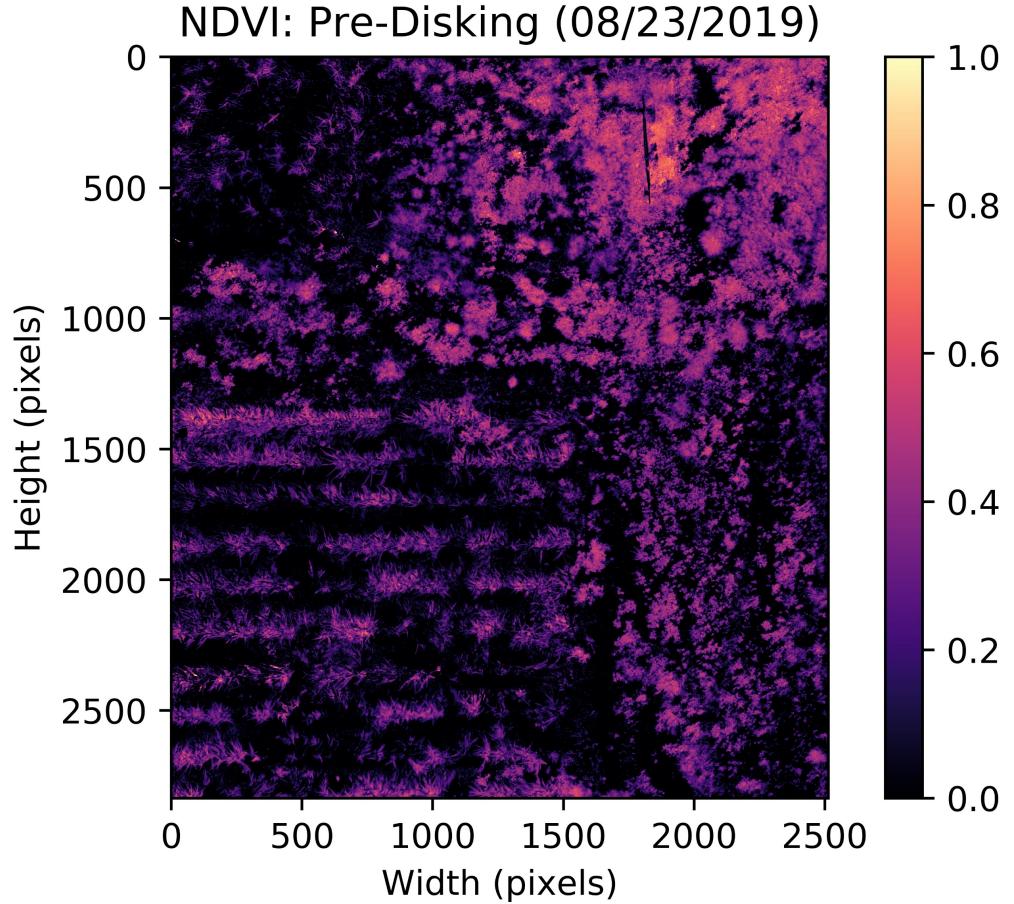
$$\frac{(0.4 - 0.30)}{(0.4 + 0.30)} = 0.14$$

# Pre-processing

- Normalization
- Visual Inspection (RGB and false color)



# NDVI Calculation and Temporal Comparisons



# Future Work

Use georeferenced grid sampling areas to see changes in NDVI through time

<b>id</b>	<b>_NDVImean</b>	<b>_NDVImedia</b>	<b>_NDVIstdev</b>	<b>_NDVImin</b>	<b>_NDVImax</b>
1	0.253409814800061	0.261904776096344	0.122921914157132	-0.158730164170265	0.584905683994293
2	0.262781428702438	0.262135922908783	0.113550103218416	-0.107142858207226	0.636363625526428
3	0.103363772561849	0.087719298899174	0.090207792295728	-0.15625	0.471698105335236
4	0.318182694218321	0.314285725355148	0.115272644313151	-0.047619048506021	0.654321014881134
5	0.279736182387243	0.282329991459846	0.114979633056552	-0.095238097012043	0.633802831172943
6	0.233917004763388	0.235955059528351	0.13235478758212	-0.103448279201984	0.612903237342834
7	0.276190064544878	0.280000001192093	0.139569198927488	-0.132075473666191	0.661538481712341
8	0.232277278374558	0.238095238804817	0.139168241561439	-0.159999996423721	0.671641767024994
9	0.251771991181724	0.255813956260681	0.120600314964588	-0.116883113980293	0.638888895511627
10	0.319759442575448	0.320754706859589	0.140796969544054	-0.161290317773819	0.677419364452362

