

NDVI in Winter wheat ? Yield – Validation ?

NPPN Båstad 20191122

11/11/2019 Karl-Johan Langvad

Karl-Johan Langvad



- Spring barley breeder SECOBRA.
- In licensing, pretesting and NL testing Lantmännen.
- Technical development.
- IT Statistics + development.
- Home brewer.
- I have done more than 120 Drone flights 2019
 - For this I have driven more than 10000 km
 - >80 000 images = >130 GB



DJI PHANTOM 4 PRO V2.0 DOUBLE 4K KIT FEATURE
DJI PHANTOM 4 PRO V2.0
DJI PHANTOM 4 ADVANCED
DJI MAVIC
DJI PHANTOM 3



DJI Phantom 4 Pro II



Mavic Pro



1200 EUR

4500 EUR
Inkl Senera 4K



DJI – NEW P4 - ap. 5500 EUR



P4 MULTISPECTRAL

Plant Intelligence for Targeted Action

Gather precise plant-level data using the P4 Multispectral – a high-precision drone with a seamlessly integrated multispectral imaging system built for agriculture missions, environmental monitoring, and more.

[Watch Video](#) ▶



Multispectral Imaging System



Live NDVI View



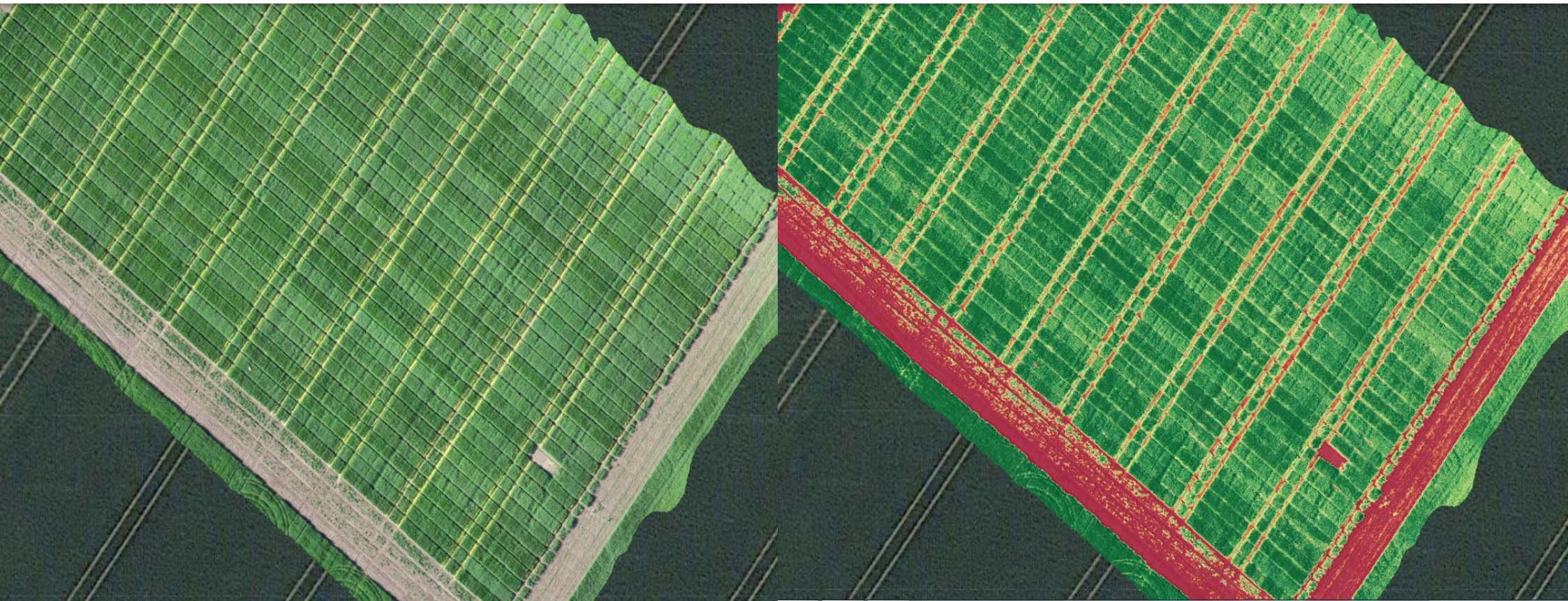
RTK Module



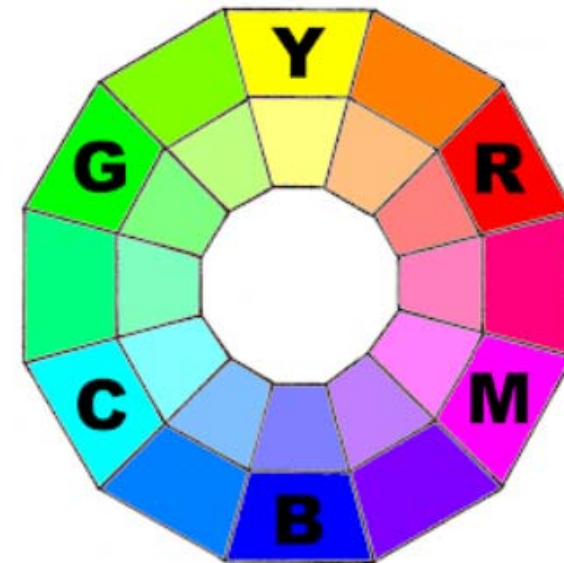
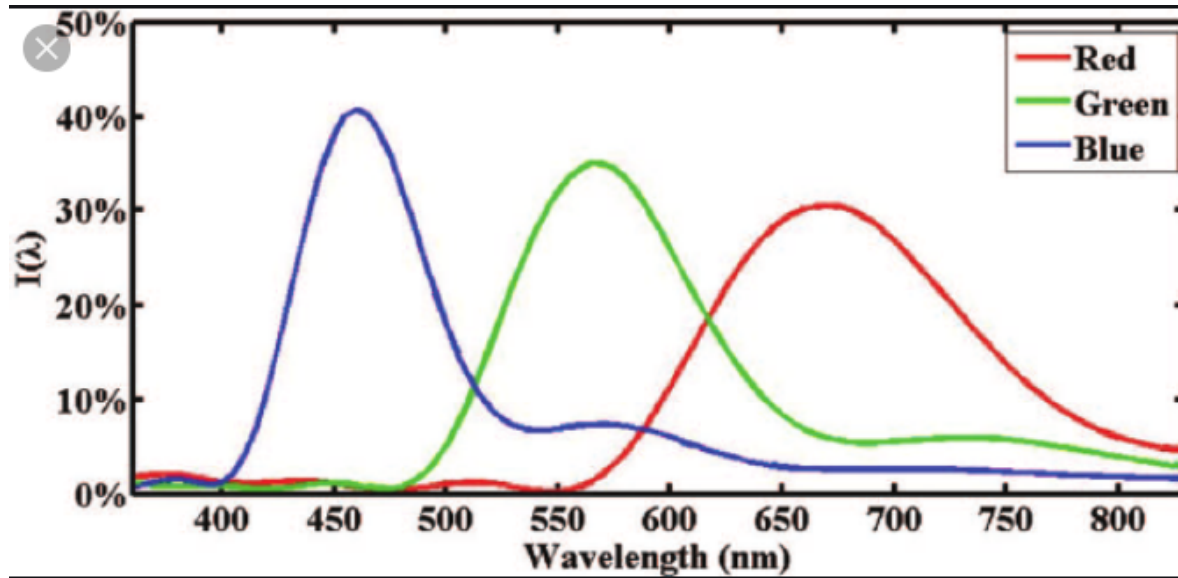
TimeSync



Have fun - Spring barley Svalöv 20190613

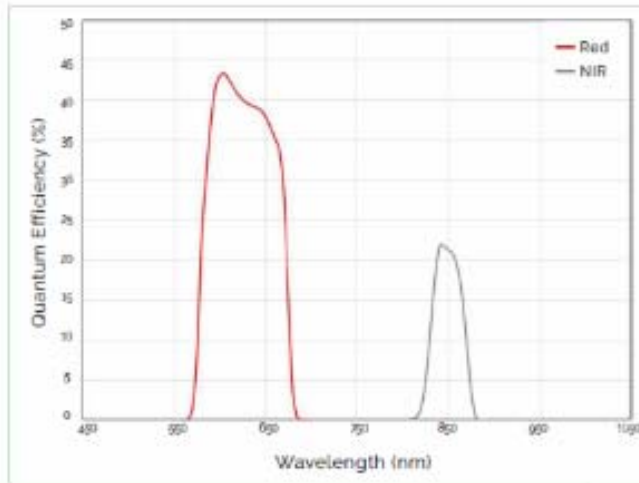


RGB - YCM

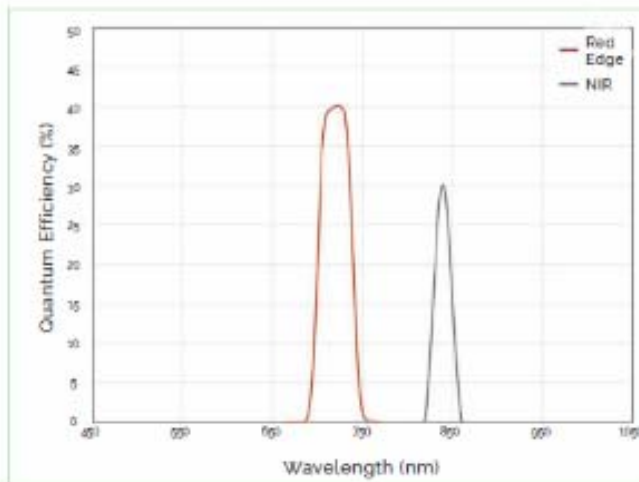


QUANTUM EFFICIENCY CURVES

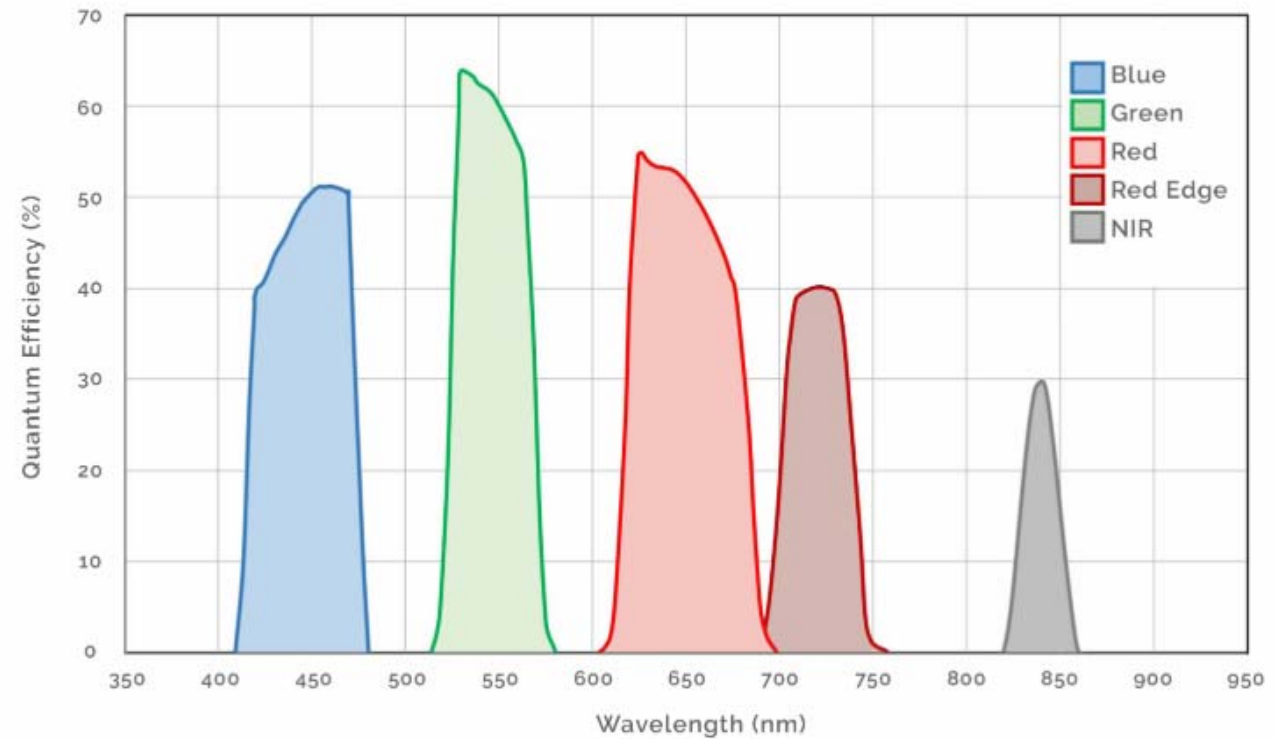
Normalized Difference
Vegetation Index
(NDVI)



Normalized Difference
Red Edge
(NDRE)



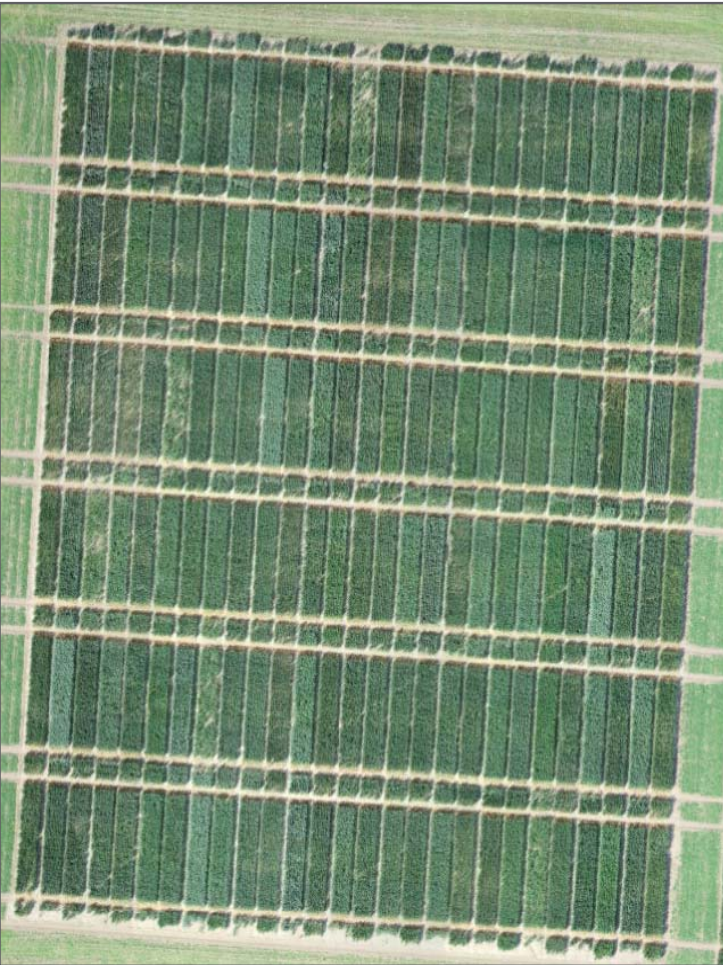
QUANTUM EFFICIENCY CURVE



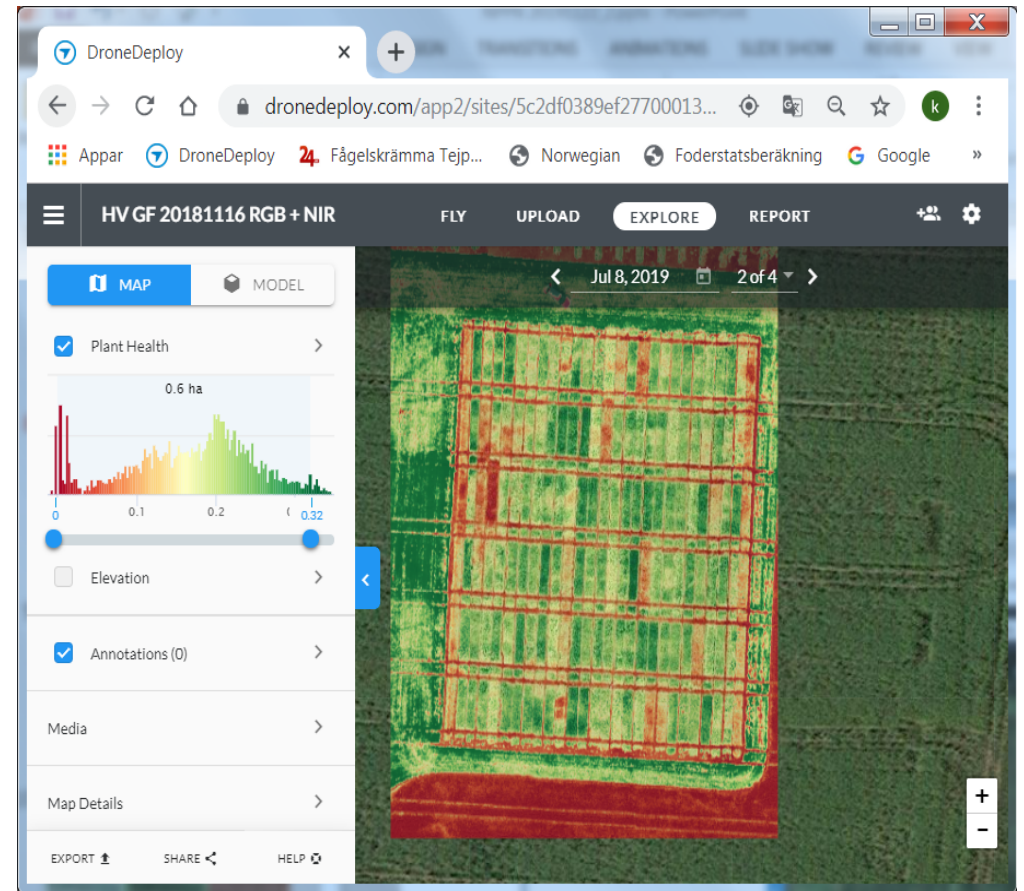
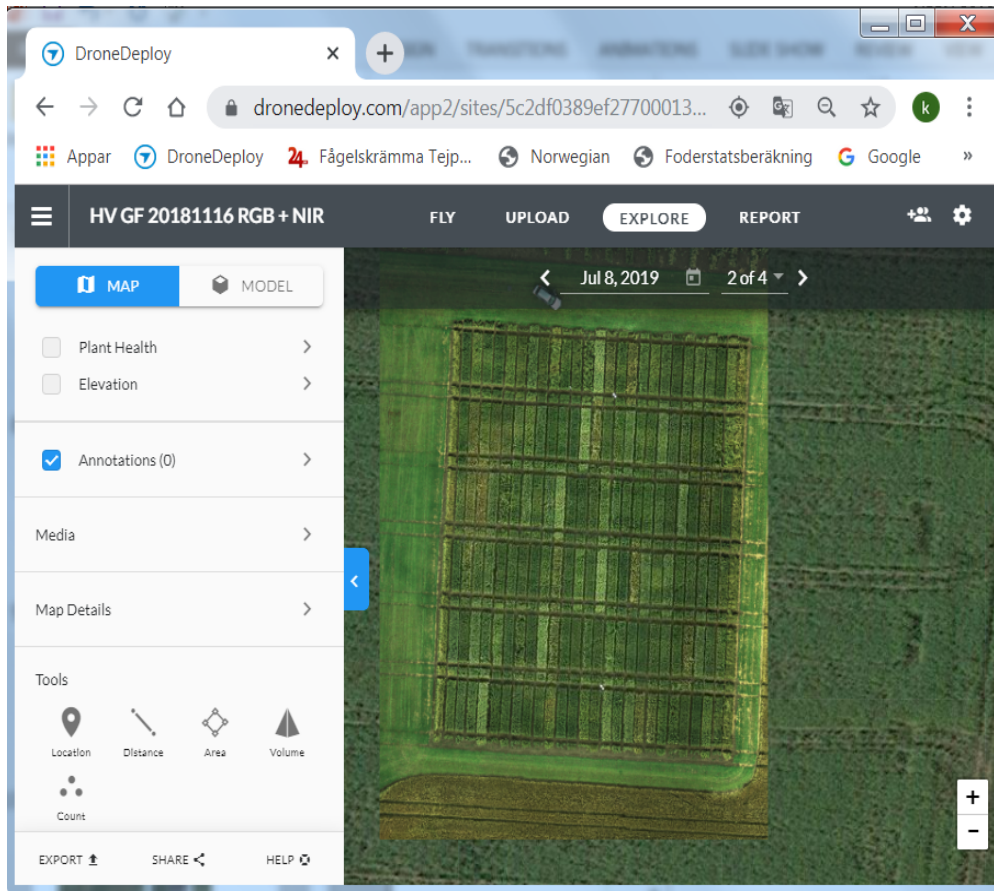
**DJI RGB
Edge-NIR**

RGB

Red



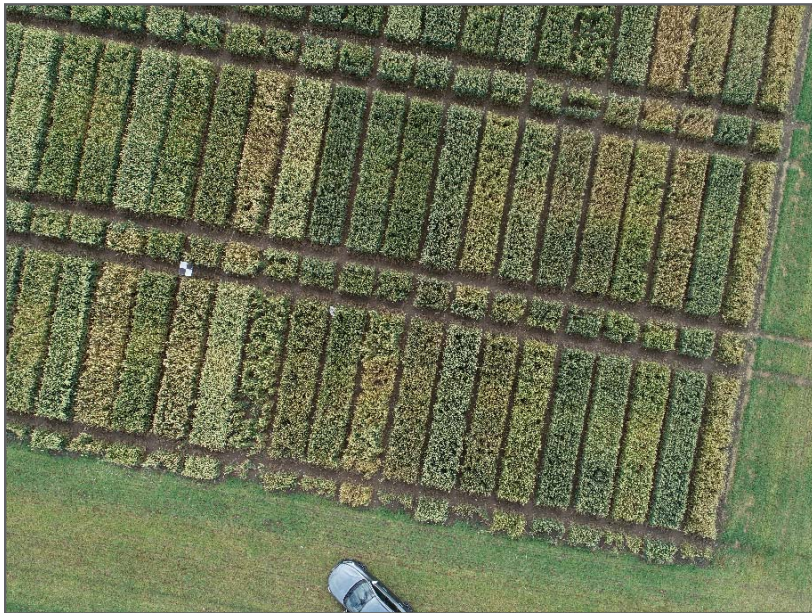
DroneDeploy



Plot cut Pixel size 0,7cm attitude 30m

20190708 DJI

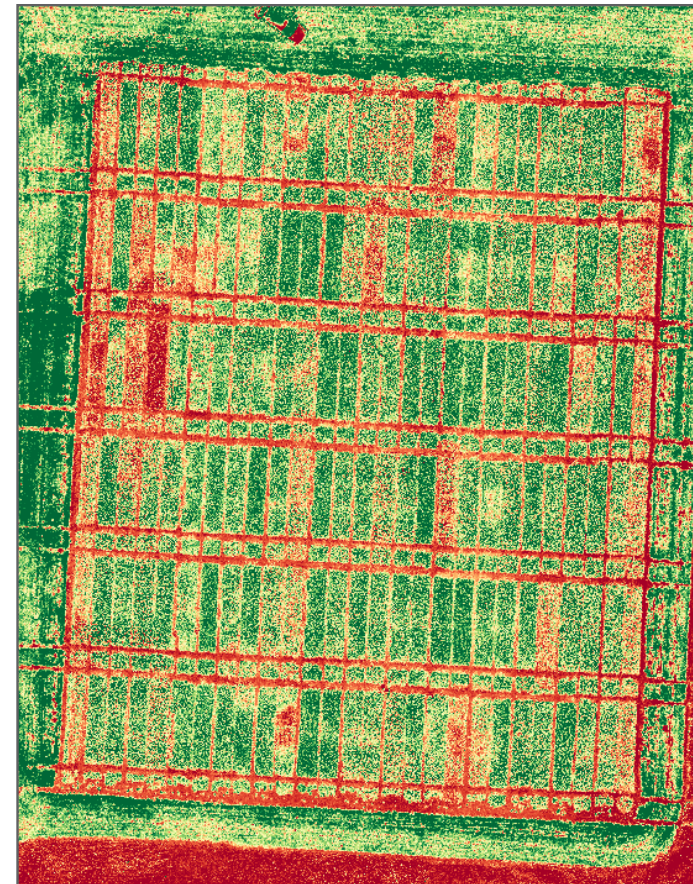
NormExce										NormExce			
ExcessGre ssGreenIn										R' + G' + ExcessGre ssGreenIn CropCover			
R	G	B	R + G + B	enIndex	dex	R'	G'	B'	B'	enIndex'	dex'	age	
98,26	107,32	77,96	283,54	38,41	0,14	114,02	125,09	90,72	329,83	45,43	0,14	0,53	
95,79	104,22	84,69	284,70	27,95	0,10	110,99	122,20	98,98	332,17	34,44	0,10	0,53	
97,12	105,73	84,46	287,32	29,88	0,10	115,90	126,97	100,92	343,78	37,12	0,11	0,54	
126,53	133,91	106,40	366,84	34,90	0,10	140,51	149,85	118,35	408,71	40,85	0,10	0,58	
81,59	92,48	70,18	244,25	33,21	0,14	100,78	113,75	85,66	300,19	41,05	0,14	0,55	
82,51	96,35	76,27	255,13	33,92	0,13	96,88	112,79	88,74	298,41	39,96	0,13	0,58	
83,53	94,83	80,02	258,38	26,10	0,10	103,12	116,77	97,56	317,46	32,87	0,10	0,54	
84,57	93,92	74,04	252,53	29,23	0,12	95,69	110,37	86,21	292,26	38,83	0,13	0,51	



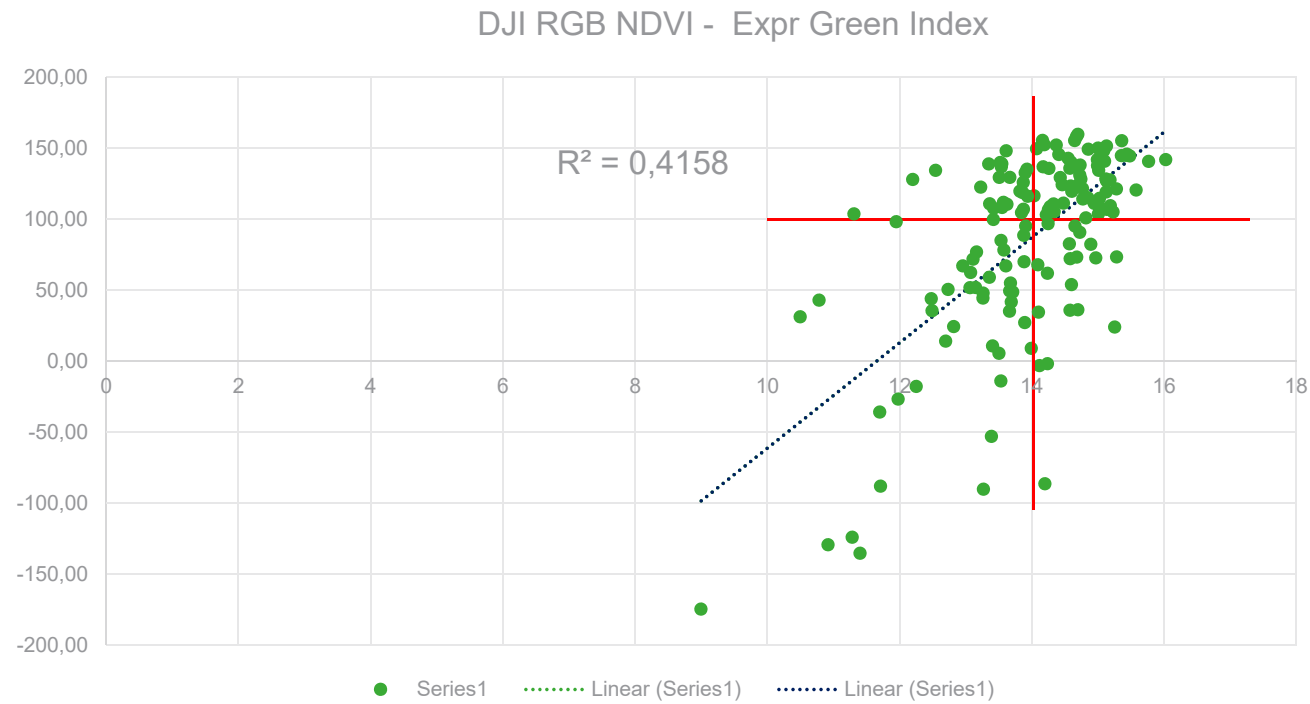
Pixel values

	Normal	NDVI	Normal	NDVI	Normal	NDVI
	DJI	DJI	Sentera	Sentera	Sentera	Sentera
	RGB	RGB	RGB	RGB	NIR+R	NIR+R
R	0,17	0,17	0,15	0,32	0,12	0,02
G	0,04	0,17	0,04	0,05	0,15	0,08
B	0,00	0,05	0,01	0,00	0,23	0,08
RGB	0,06	0,00	0,07	0,12	0,15	0,01
Expr Gr	0,10	0,42	0,01	0,44	0,17	0,06
N expr G	0,13	0,39	0,21	0,41	0,02	0,06
R'	0,08	0,22	0,18	0,34	0,00	0,01
G'	0,05	0,10	0,08	0,27	0,00	0,05
B'	0,03	0,11	0,04	0,30	0,00	0,00
R'G'B'	0,05	0,17	0,11	0,32	0,00	0,00
Expr Gr	0,02	0,32	0,00	0,35	0,00	0,04
N expr G	0,00	0,20	0,17	0,27	0,00	0,02
Crop Cov	0,11	0,37	0,01	0,29	0,00	0,04
	0,06	0,21	0,08	0,27	0,06	0,04

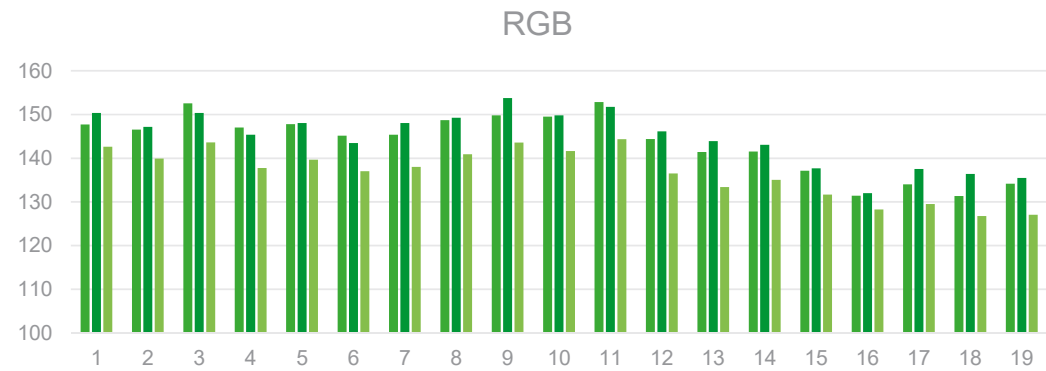
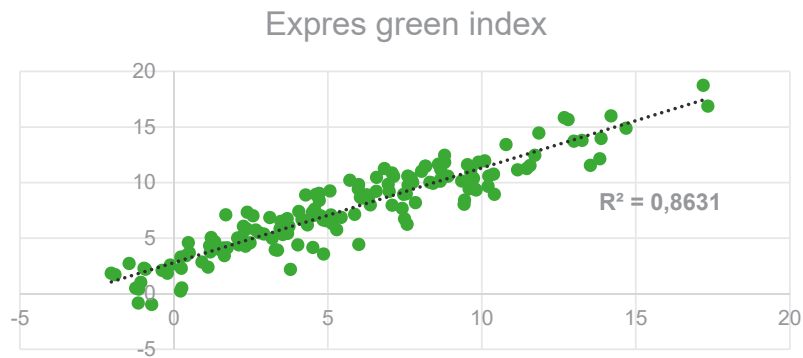
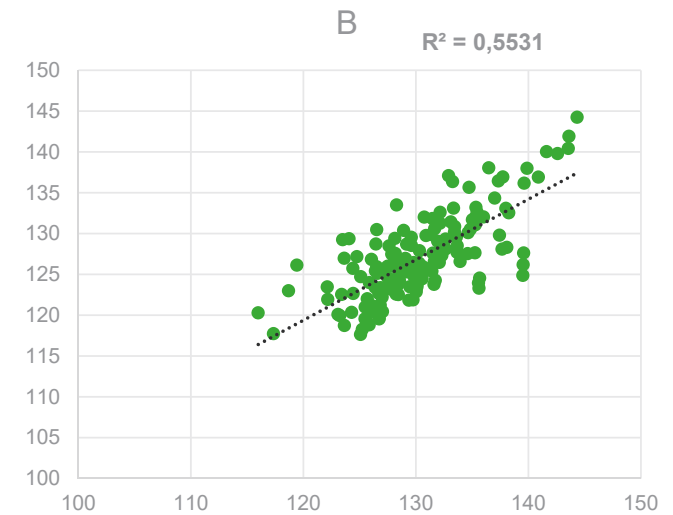
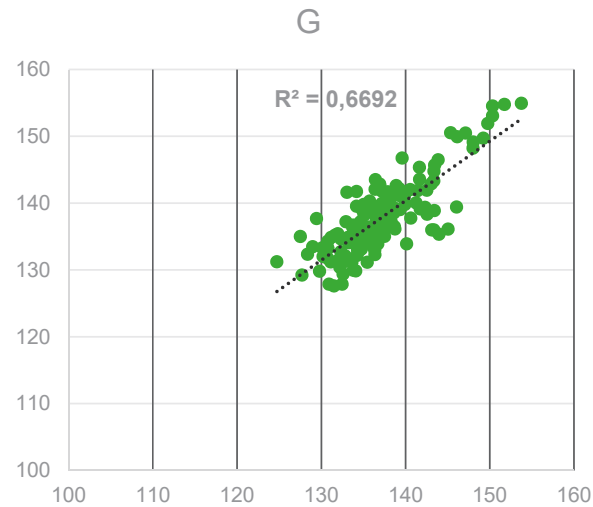
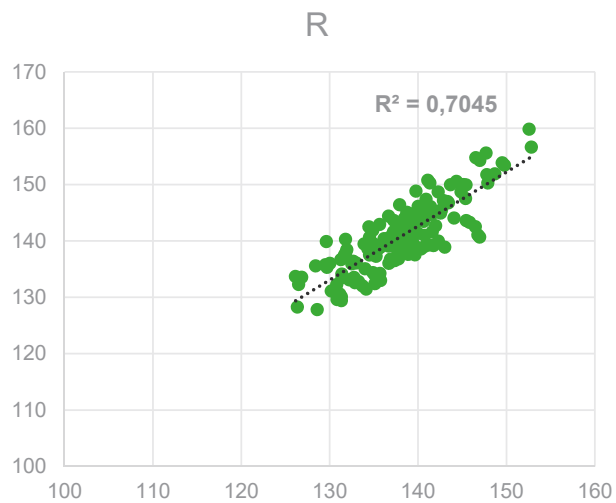
RGB NDVI



Keep it simple !



Whinter Wheat 2019/20 Atitute 20m/30m





Karl-Johan Langvad

 Lantmännen
Lantbruk