

Area under the vegetation index curve - How far can we take it?

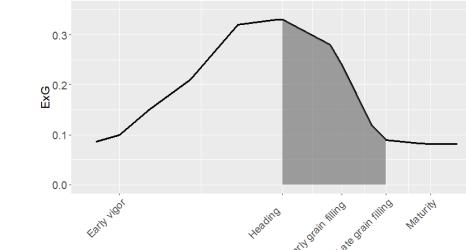
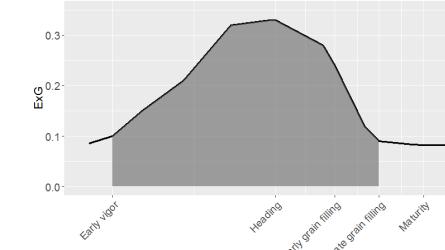
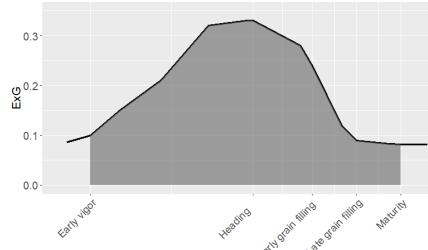
NPPN - 2020

Signe M. Jensen
smj@plen.ku.dk

KØBENHAVNS UNIVERSITET



Recap from last year



	Large plots	Small plots
Growth period	2018	2019
Early vigor – maturity	0.43	0.35
Grain filling	0.44	0.33
Early vigor - grain filling	0.35	0.28

How far can we take the correlations?

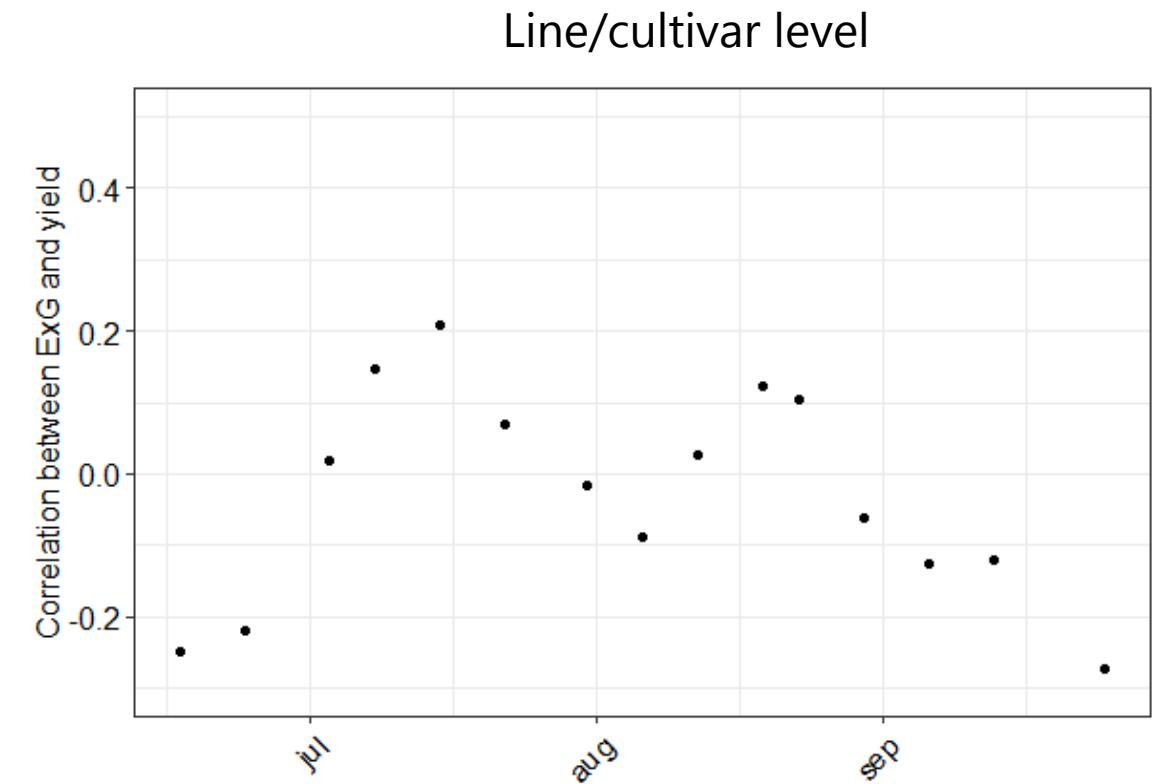
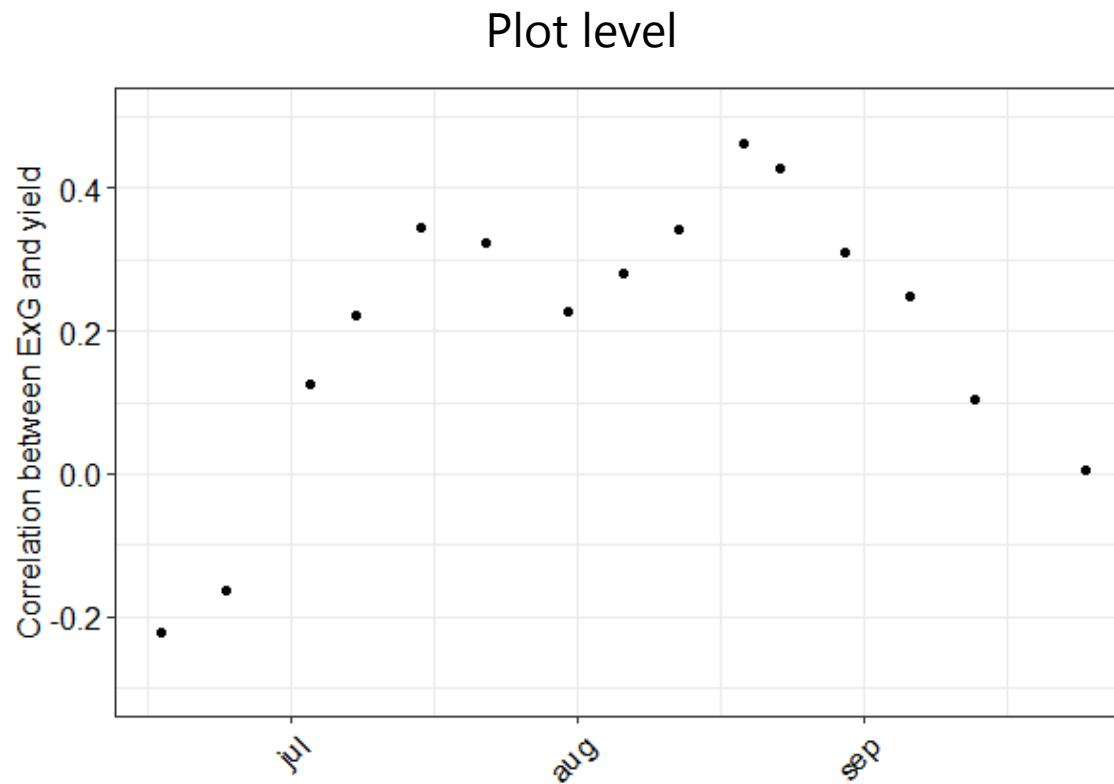
- Are correlations similar in other crops (spring wheat)?
- And what about other locations (Graminor, Norway)?
- What if correlations are based on lines/cultivars (rather than plots)?
- Does AUVIC correlate to yield another year?
- Or to yield at other locations?

New crop – new location

- Spring wheat
 - Graminor, Norway
 - Weekly flights
-
- Growing season 2019
 - Sowing: 4/6
 - Harvest: 6-7/10



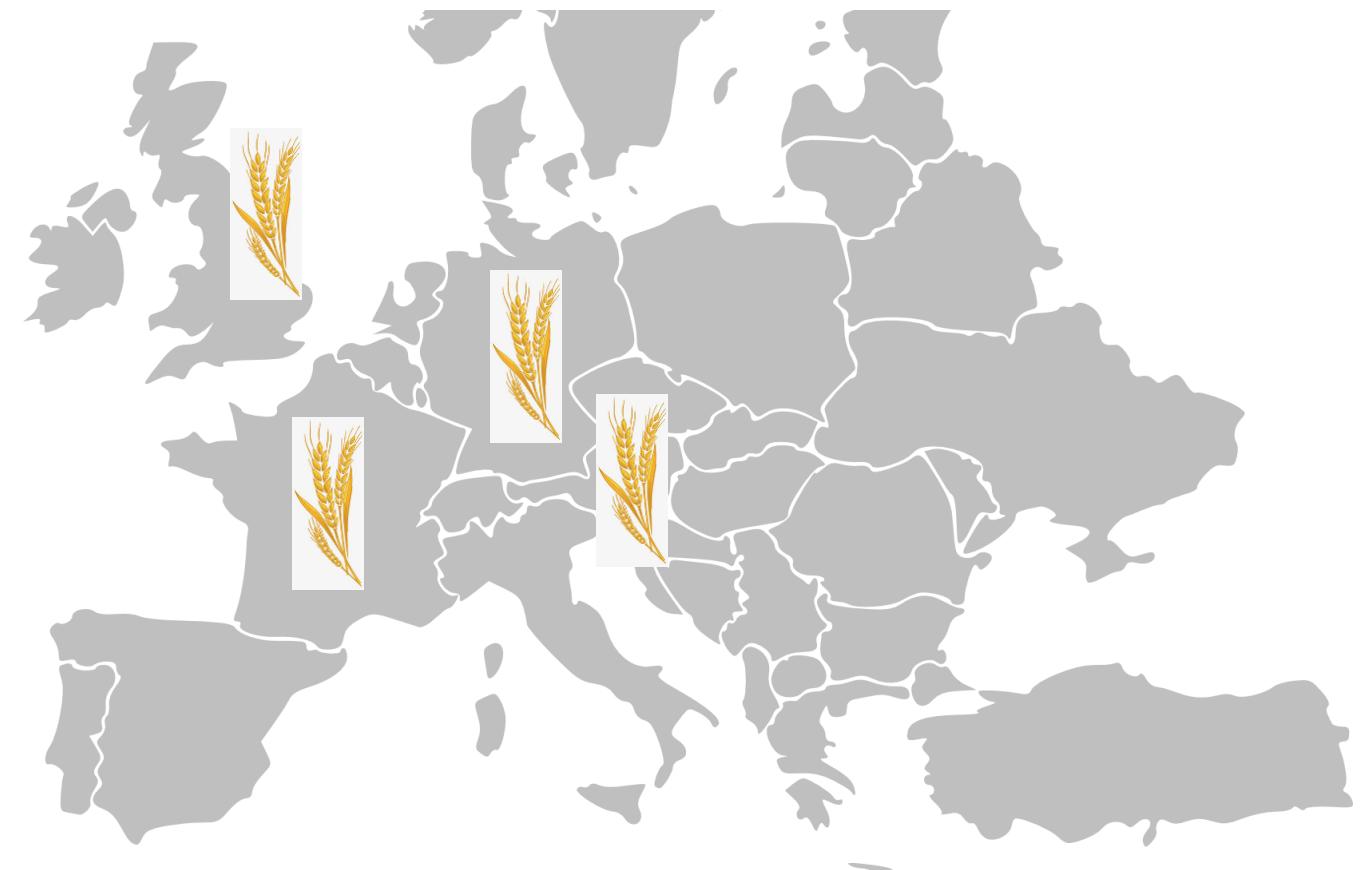
Seasonal change in correlations between ExG and yield



Correlation between AUVIC and yield

Growth period	Germination - Heading	Heading - harvest	Heading – Start maturing	Maturing
-0.02	0.03	-0.04	0.00	-0.17

Correlations to future trials – Winter barley



Danish trials

AUVIC 2019 - Yield 2019

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
Sejet	423	0.29	0.16	0.22	0.19	0.19
Nørre Aaby	201	0.20	0.02	0.13	0.17	0.09

AUVIC 2019 - Yield 2020

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
Sejet	82	0.01	0.08	-0.06	-0.15	-0.03
Nørre Aaby	82	-0.08	0.16	-0.08	-0.22	0.02

AUVIC 2018 - Yield 2019

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
Sejet	100		0.25	0.30	0.31	0.30
Nørre Aaby	100		0.04	0.04	0.03	0.03

French trials

AUVIC 2019 - Yield 2020

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
FR1	29	0.33	0.41	0.34	0.21	0.40
FR2	29	-0.03	0.18	0.09	-0.01	0.10
FR3	29	-0.23	0.14	0.00	-0.11	0.13
FR4	29	0.11	0.19	0.26	0.28	0.33

AUVIC 2018 - Yield 2019

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
FR5	39		0.31	0.28	0.26	0.27
FR6	39		0.17	0.24	0.26	0.23
FR7	39		0.11	-0.07	-0.12	-0.03
FR8	39		0.04	0.18	0.22	0.15
FR9	6		0.65	0.60	0.59	0.60
FR10	6		0.62	0.54	0.51	0.55

German trials

AUVIC 2019 - Yield 2020

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
GER1	11	-0.06	0.56	0.11	-0.15	0.42
GER2	11	0.21	0.67	0.26	-0.03	0.53
GER3	11	0.18	0.49	0.24	0.04	0.44
GER4	11	0.16	0.44	-0.01	-0.26	0.26
GER5	11	0.05	0.31	0.09	-0.03	0.38
GER6	27	0.21	-0.19	-0.02	0.13	0.05
GER7	11	0.44	0.47	0.37	0.22	0.42
GER8	24	-0.45	0.12	-0.34	-0.49	-0.17
GER9	34	-0.13	0.38	0.17	-0.10	0.05

German trials

AUVIC 2018 - Yield 2019

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
GER10	6		0.62	0.73	0.75	0.71
GER11	37		0.27	0.35	0.37	0.34
GER12	6		0.93	0.88	0.86	0.89
GER13	6		0.77	0.83	0.85	0.83
GER14	34		0.44	0.51	0.52	0.49
GER15	6		0.61	0.68	0.70	0.68
GER16	6		0.75	0.78	0.79	0.76
GER17	17		0.33	0.38	0.38	0.35
GER18	17		0.03	0.01	0.00	-0.01
GER19	17		0.10	0.23	0.25	0.19
GER20	6		0.00	0.14	0.18	0.13
GER21	6		0.27	0.15	0.11	0.14
GER22	17		-0.13	-0.13	-0.13	-0.15

UK trials

AUVIC 2019 - Yield 2020

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
UK1	14	0.05	0.01	-0.05	-0.08	-0.13
UK2	20	0.19	0.29	0.28	0.20	0.49
UK3	24	0.00	0.36	0.14	0.01	0.26
UK4	34	-0.14	0.18	-0.04	-0.25	-0.11
UK5	20	-0.07	0.55	0.36	0.09	0.53
UK6	20	0.05	0.19	0.15	0.12	0.45
UK7	9	-0.13	0.56	0.35	-0.01	0.43
UK8	9	0.47	0.94	0.73	0.21	0.77
UK9	14	-0.45	-0.07	-0.42	-0.48	-0.44

UK trials

AUVIC 2018 - Yield 2019

Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
UK10	15		0.19	0.11	0.08	0.10
UK11	22		0.15	0.27	0.29	0.24
UK12	34		0.16	0.08	0.06	0.12
UK13	34		0.47	0.44	0.43	0.45
UK14	15		0.45	0.42	0.40	0.44
UK15	22		0.37	0.32	0.31	0.35
UK16	13		-0.42	-0.35	-0.31	-0.34
UK17	4		0.55	0.53	0.54	0.58
UK18	4		0.72	0.66	0.64	0.71
UK19	13		-0.29	-0.09	-0.03	-0.12
UK20	4		0.23	0.19	0.19	0.25
UK21	13		-0.12	0.00	0.05	0.04
UK22	4		0.64	0.60	0.59	0.65
UK23	4		0.68	0.65	0.66	0.70
UK24	22		0.52	0.60	0.61	0.60
UK25	15		0.25	0.12	0.09	0.12

Austrian trials

AUVIC 2019 - Yield 2020

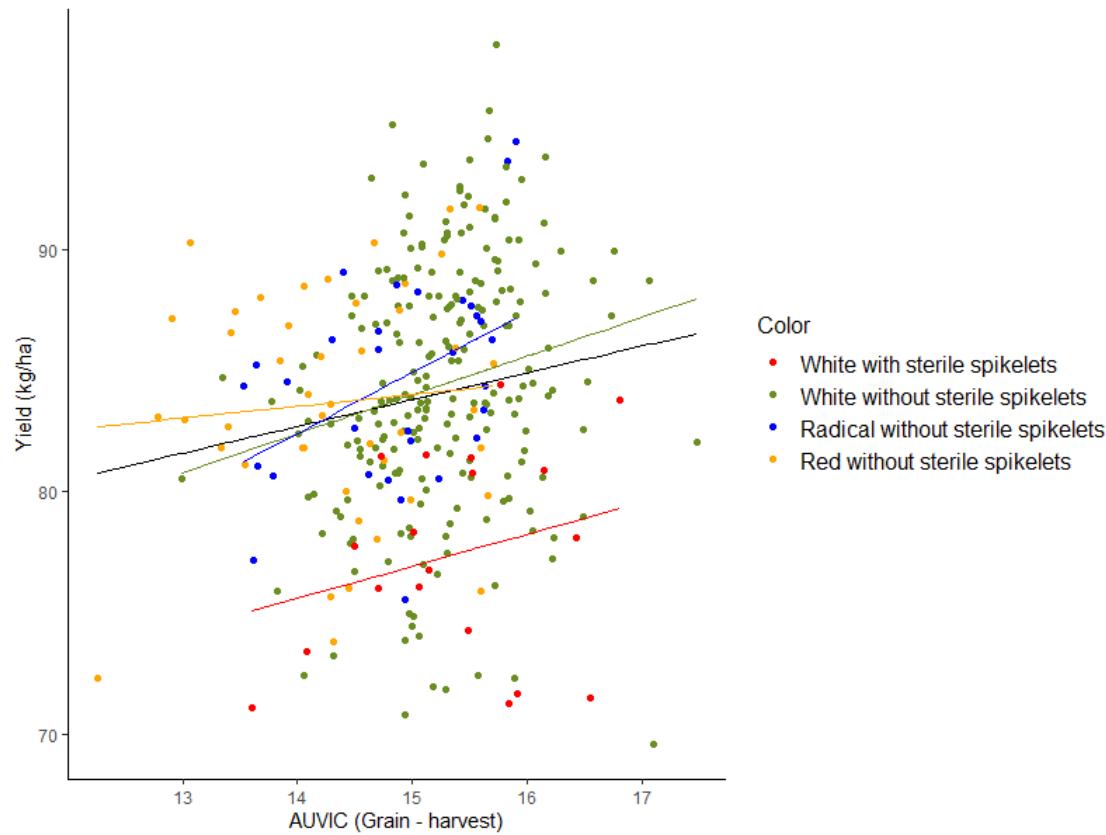
Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
AUT1	20	-0.08	-0.21	-0.13	0.00	-0.03
AUT2	20	-0.16	-0.55	-0.26	0.10	-0.28
AUT3	20	-0.06	0.05	-0.19	-0.36	-0.16

AUVIC 2018 - Yield 2019

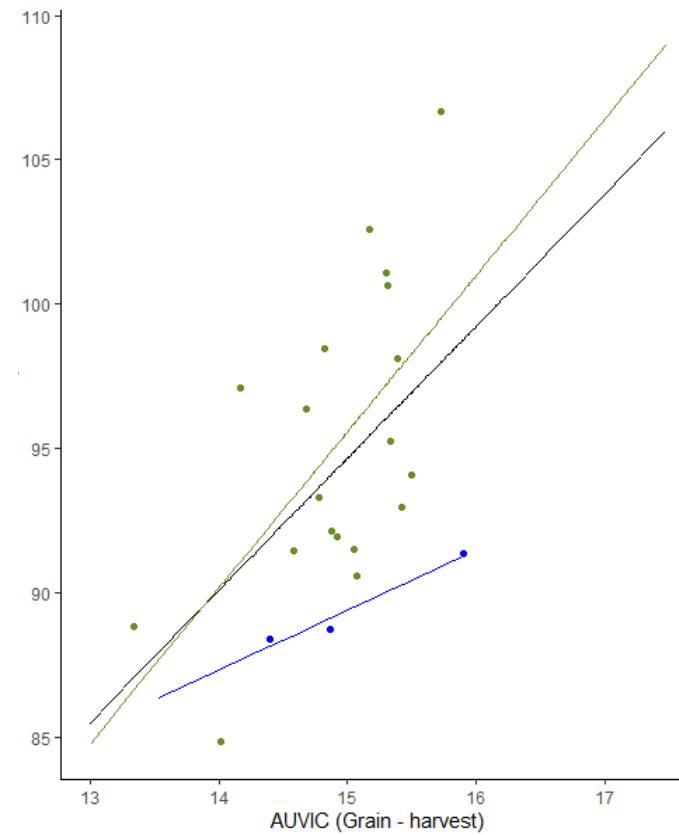
Location	N	Growing season	Heading - harvest	Early vigor – harvest	Early vigor – maturity	Heading - maturity
AUT4	16		0.53	0.55	0.55	0.57
AUT5	6		0.08	0.04	0.03	0.03
AUT6	16		0.28	0.44	0.47	0.42
AUT7	16		0.63	0.62	0.60	0.62

Anthocyanine colouring of spikes (on a 1-3 scale)

Sejet 2019 -> Sejet 2019

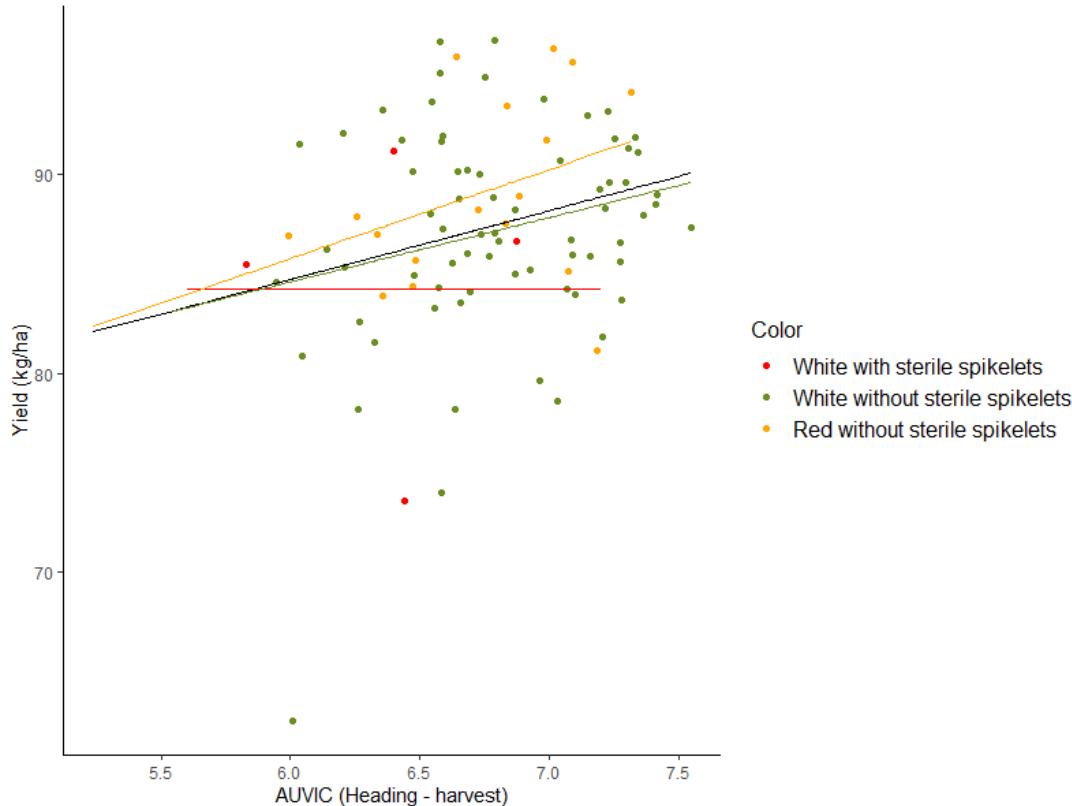


Sejet 2019 -> France 2020

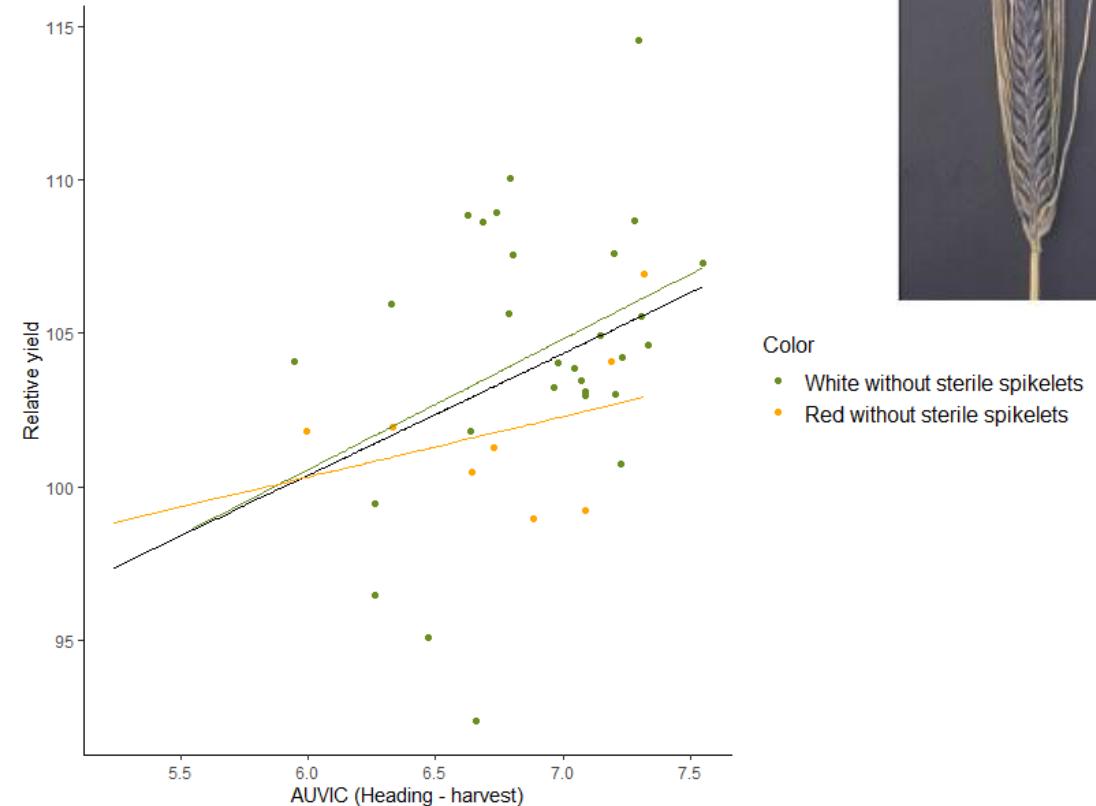


Anthocyanine colouring of spikes (on a 1-3 scale)

Sejet 2018 -> Sejet 2019



Sejet 2018 -> France 2019



Conclusions

- AUVIC may be a simple indicator of (relative) yield
- AUVIC seems to be a combination of plot and line specific traits
- The grain-filling period seems to be a relevant observation period
- AUVIC for different growing stages may be relevant for different "markets"
- AUVIC is NOT a magic tool applicable to all crops.