



Gowlett  
Grain



# Spring Oat Forum

*6 January 2021*

Rosemary Hall, Ian Lutey, Steffen Beuch, Sarah Clarke, Gordon Gowlett and  
Teresa Meadows



CEREALS & OILSEEDS

# Housekeeping



**REC** 



@AHDB\_Cereals  
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# BASIS/NRoSO Points



Name; BASIS Account No; Postcode



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Postcode



Spring oats – the quest for a  
consistent, profitable crop that  
meets millers requirements

# Format

08:30	Welcome and introductions	Teresa Meadows, AHDB and Gordon Gowlett, Gowlett Grain
08:40	Lessons learnt from spring oat research in harvest 2020	Rosemary Hall, Crop Research Services
09:00	Spring oat growing in practice	Ian Lutey, RH Topham & Sons
09:15	Modern spring oat varieties – what is important to know when growing them?	Dr Steffen Beuch, Nordsaat Saatzucht
09:30	Questions and discussion	Speakers, Sarah Clarke, ADAS, James Webster, AHDB and audience
09:55	Further information and wrap up	Teresa Meadows and Gordon Gowlett
10:00	Close	



What is your experience of growing spring oats?

- Grown for a long time
- Grown for three-four years
- Grown for the first time in harvest 2020
- Not grown yet, but I'm interested!

# Poll

Which parts of spring oat growing regularly meet your expectations?

- Yield
- Quality
- Agronomy
- Marketing
- Achieving specification

# Poll

Which parts of spring oat growing don't regularly meet your expectations?

- Yield
- Quality
- Agronomy
- Marketing
- Achieving specification





## AHDB Spring Oat Forum

# Lessons Learnt From Spring Oat Research



# Introduction

- Drilling date, Seed Rate, Variety Research, Mascani Vs Elyann from spring 2016-2018 (3 years).
- Cover crop prior to spring oats, 1<sup>st</sup> year initial data.



# Drilling Date, Seed Rate, Variety

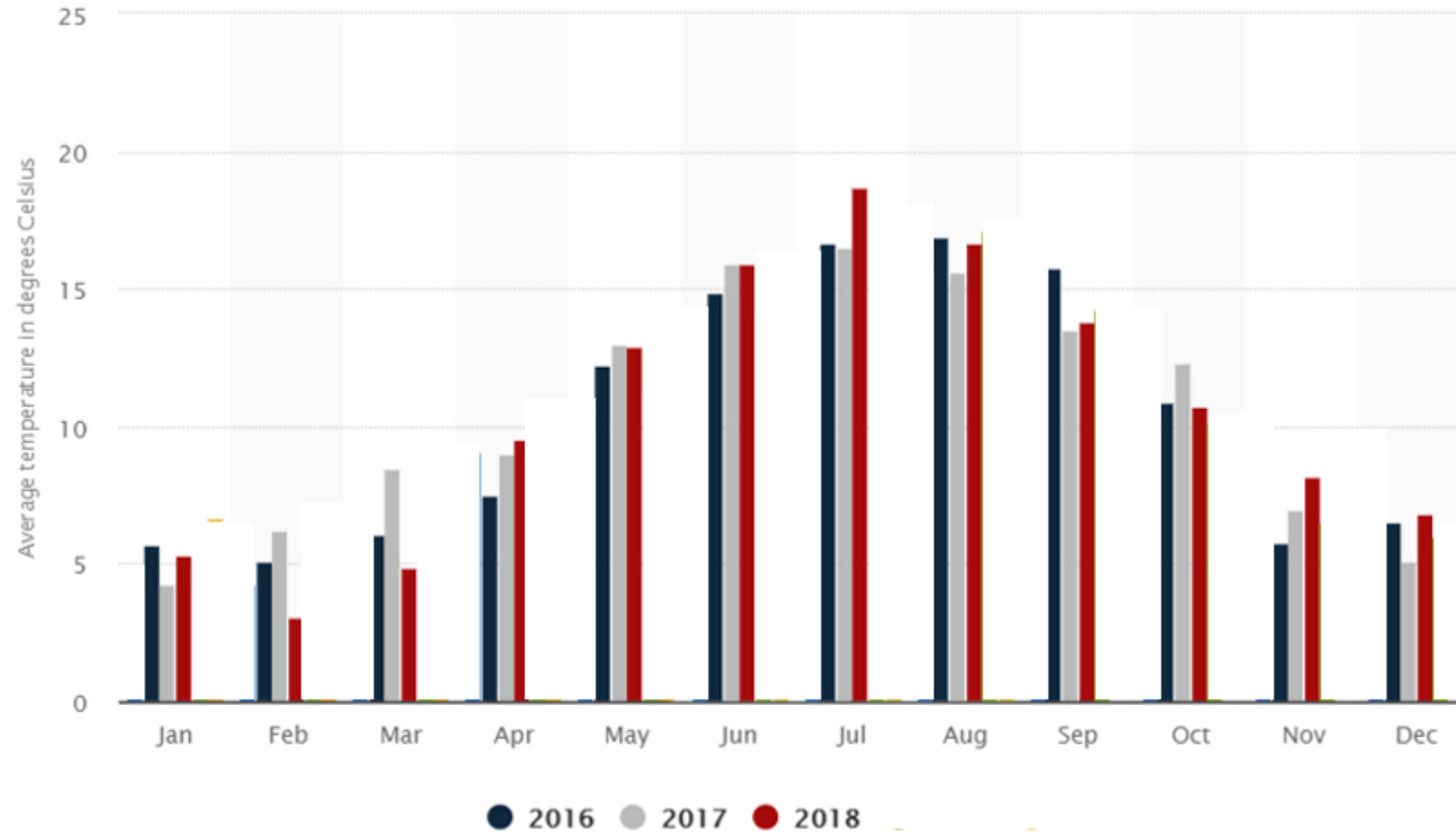
## Background

- Mascani grown in the spring. End user did not favour end quality but no data to support this.
- Winter oats under pressure from blackgrass and seasonal conditions.
- Little work done by end user on springs. Grain considered wrong size for the process. No data.
- New spring variety coming to market showing interesting quality benefits.

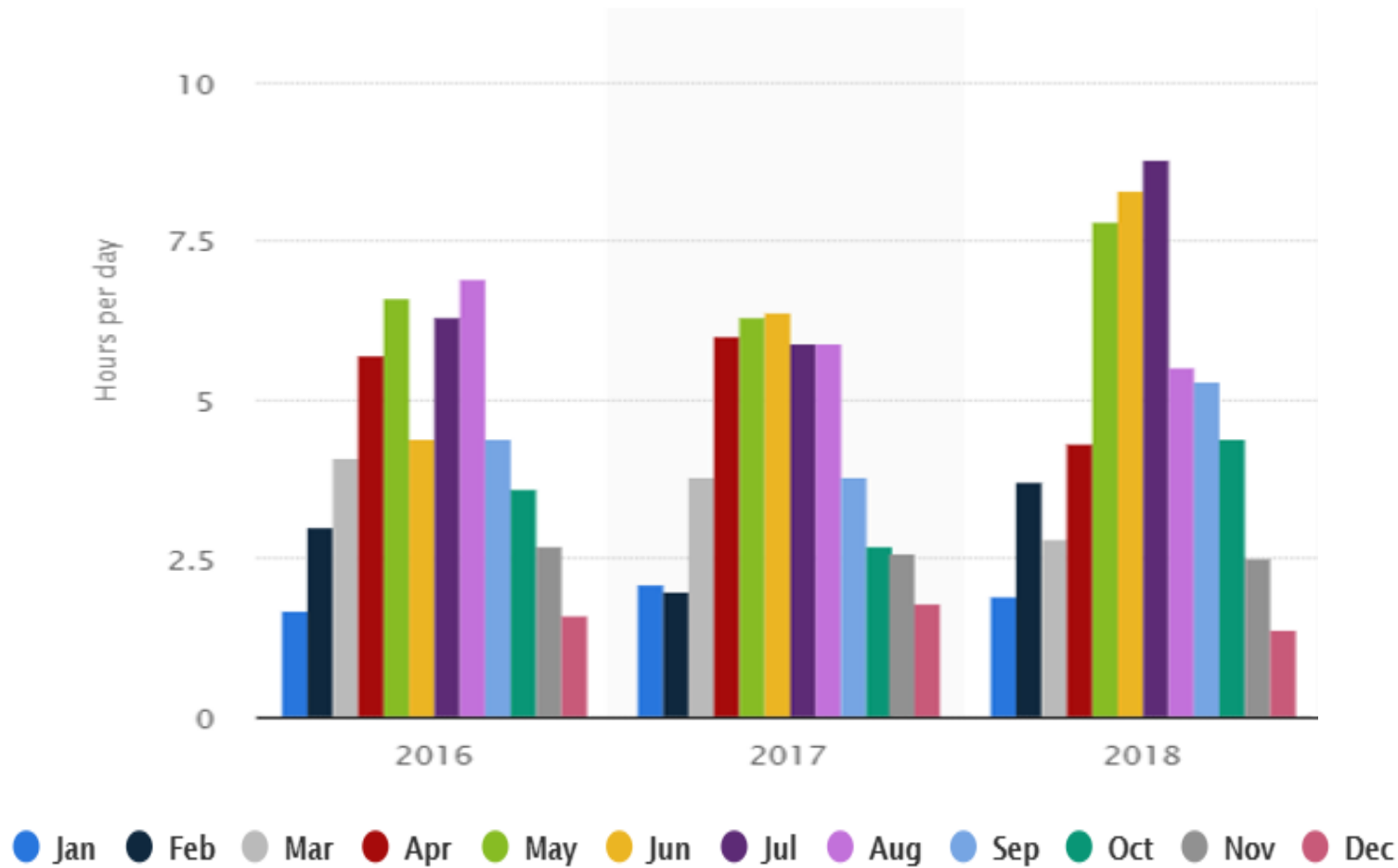




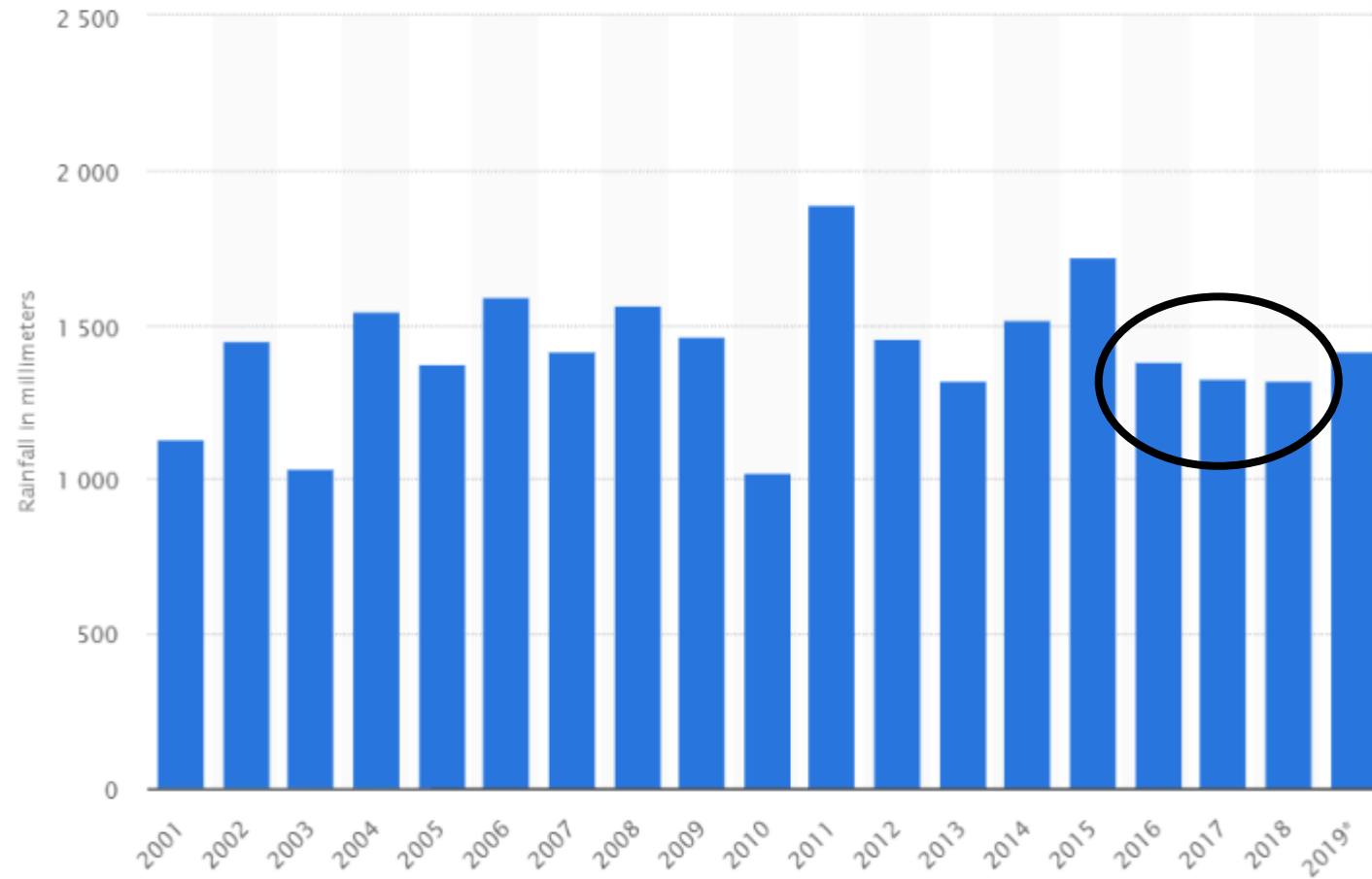
# UK Monthly Average Daily Temperature



# UK Monthly Average Daily Sun Hours



# UK Average Annual Rainfall

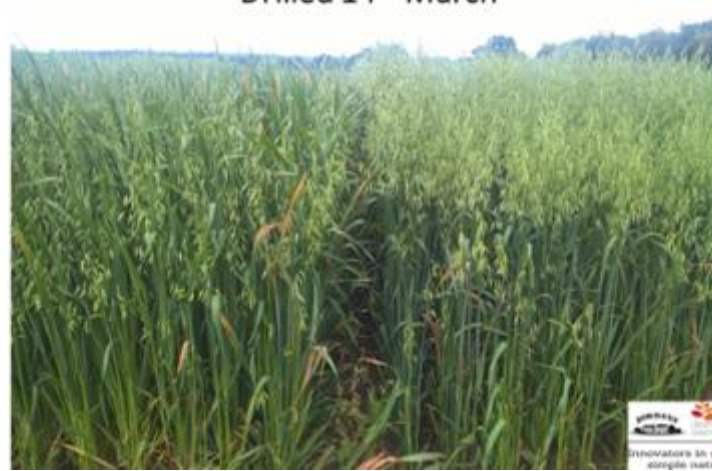


# Drilling Date, Seed Rate, Variety

Spring drilled Mascani (LHS) Vs Elyann (RHS)  
Drilled 25<sup>th</sup> February



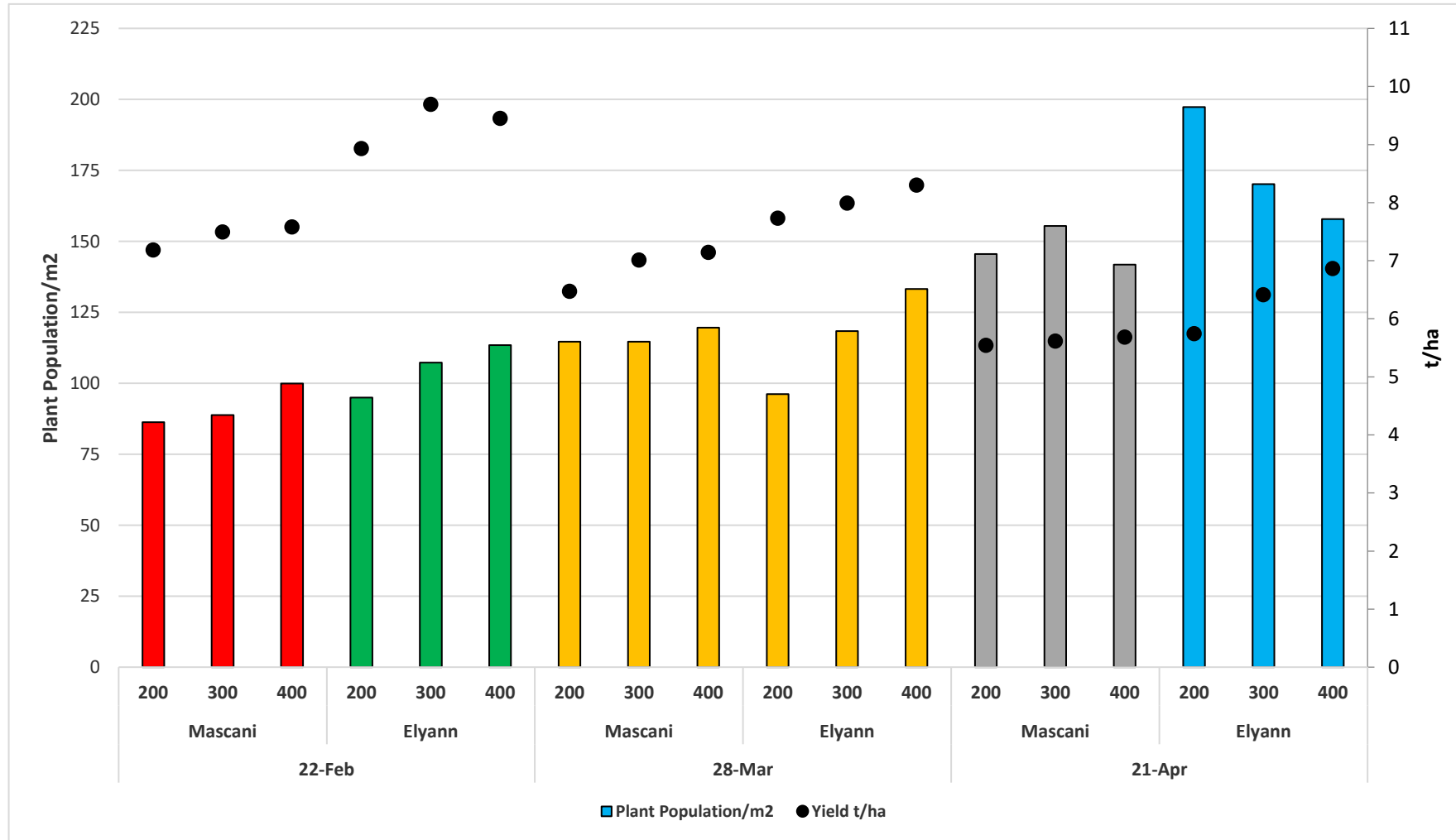
Spring drilled Mascani (LHS) Vs Elyann (RHS)  
Drilled 14<sup>th</sup> March



Spring drilled Mascani (LHS) Vs Elyann (RHS)  
Drilled 7<sup>th</sup> April

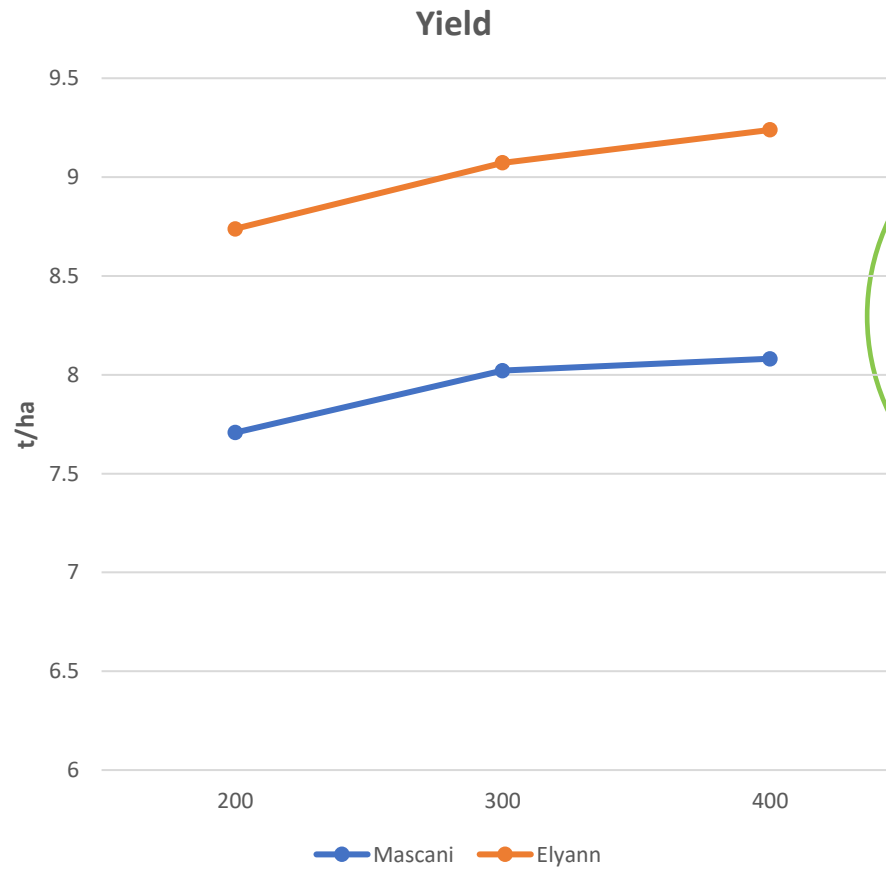
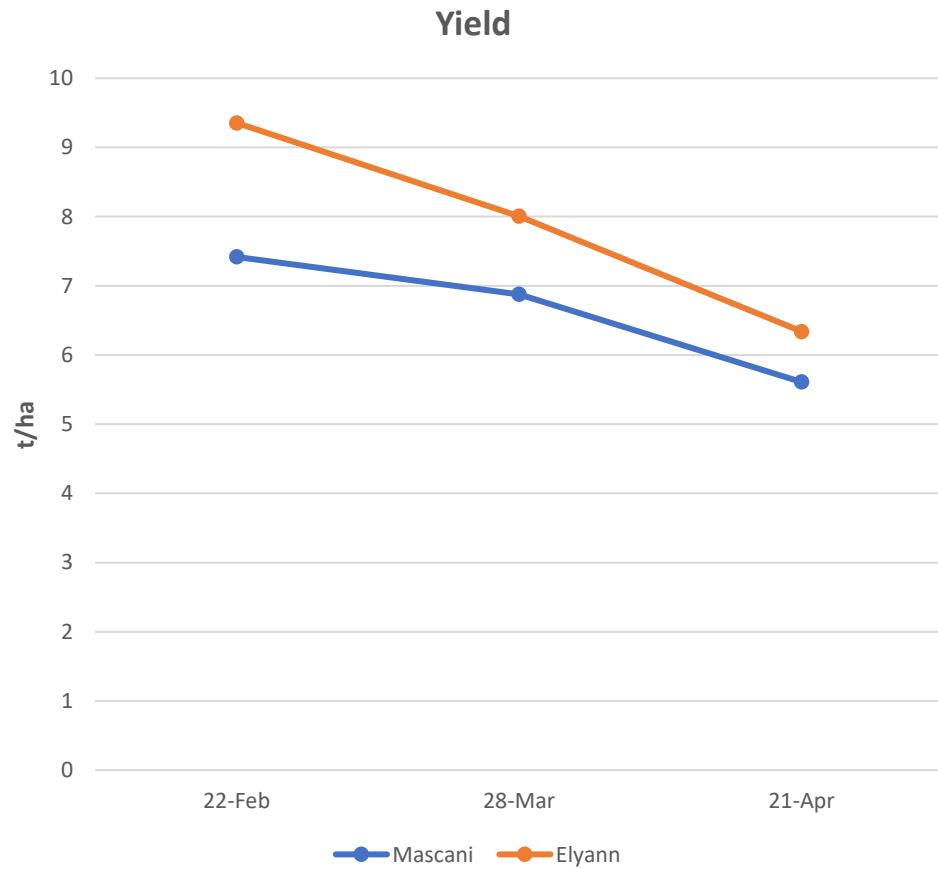


# Plant Population/m<sup>2</sup> & Yield t/ha

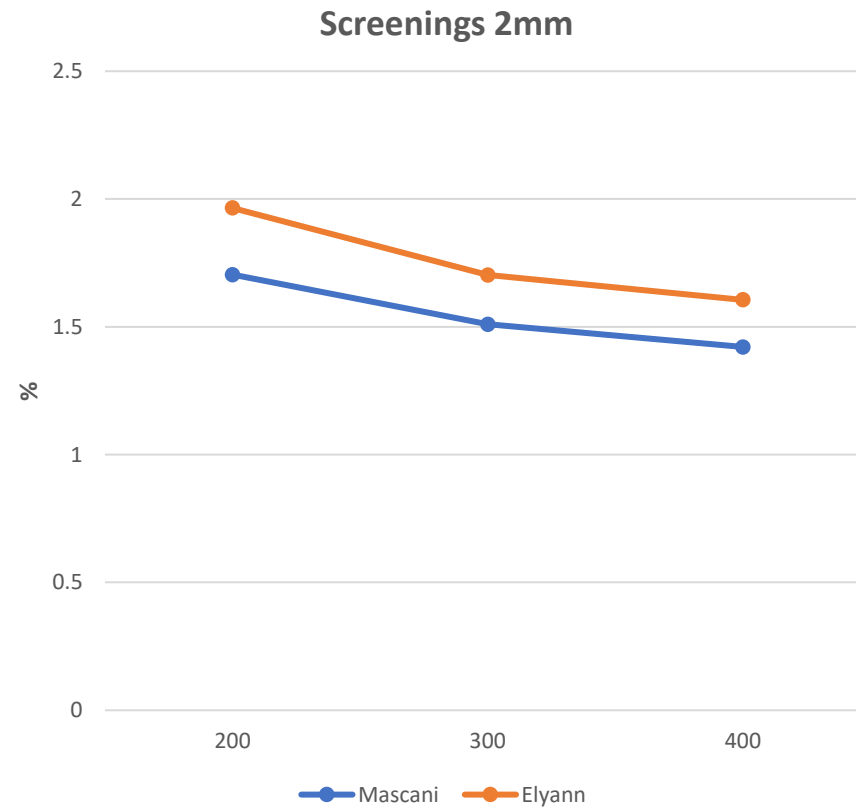
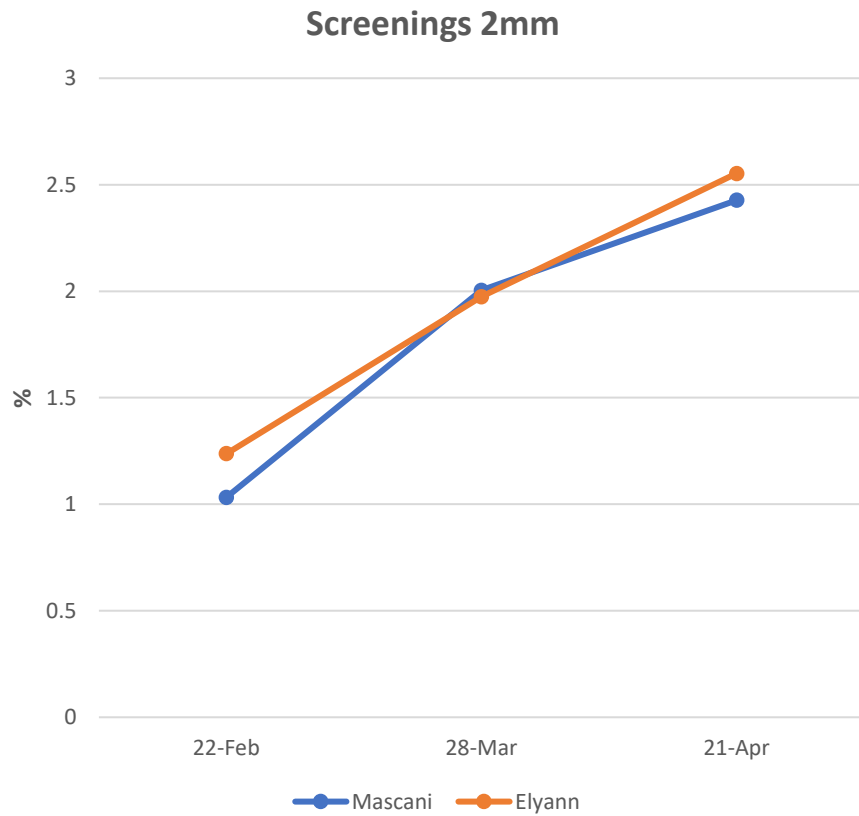




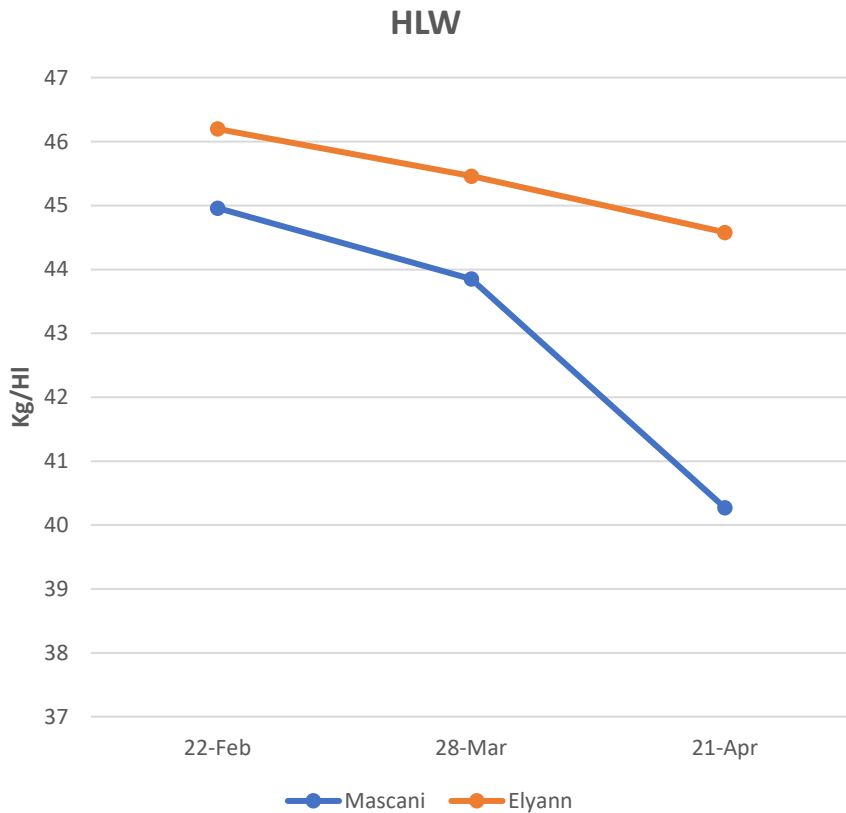
# Yield t/ha by Drilling Date & Seed Rate



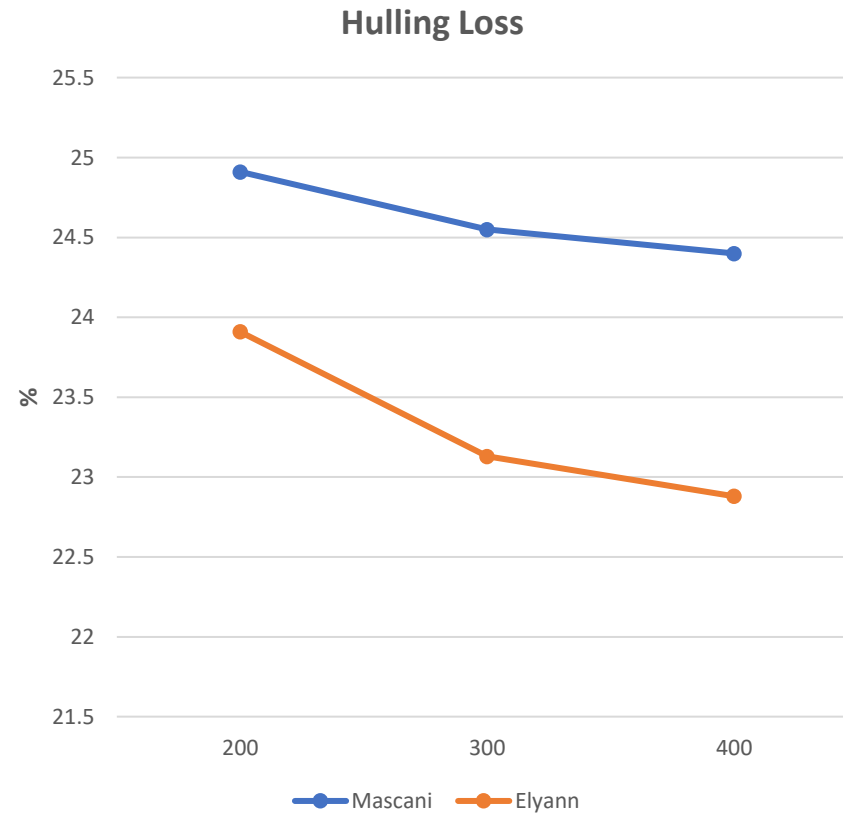
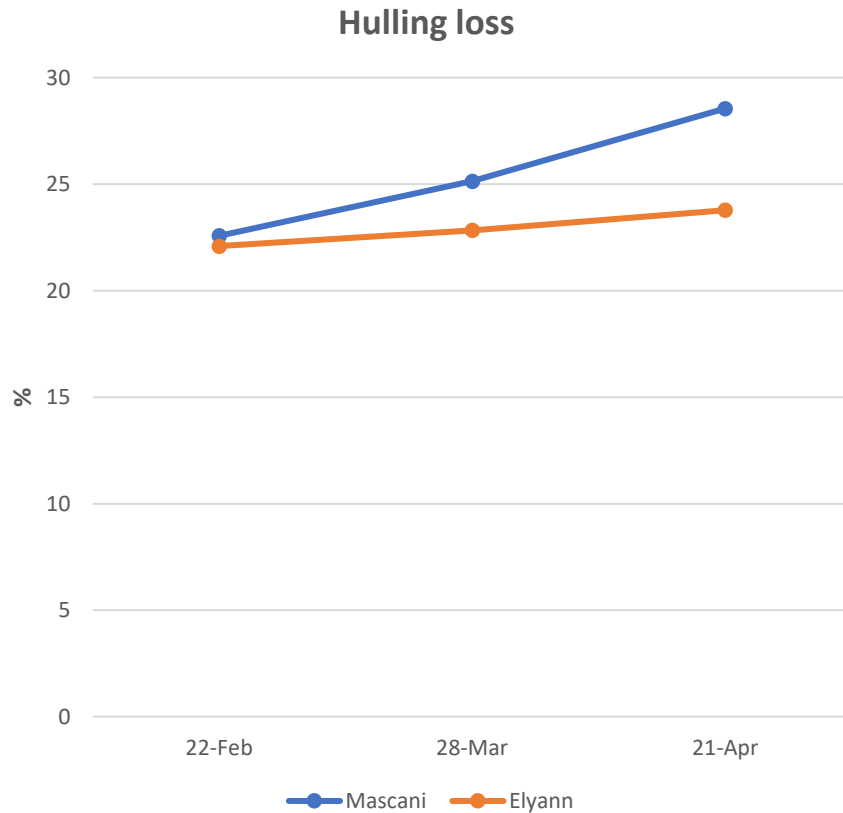
# % Screenings by Drilling Date & Seed Rate



# HLW (kg/ha) by Drilling Date & Seed Rate



# % Hulling Loss by Drilling Date & Seed Rate



# Key Points:

- After February, Mascani is very late to mature compared to a 'true' spring which not only impacts on yield but has a large negative effect on quality and delayed harvest date.
- **DO NOT** plant Mascani in the spring if extreme conditions are forecast. Mascani does not have the vigour to deal with the extremes when spring sown. It is an inconsistent variety if grown in the spring and performance is very season dependent.
- The highest yield and best quality are achieved from early sowing in most instances (February)
- Elyann outperforms Mascani. Isabel is expected to perform like Elyann if not better!
- Statistically no difference between 300 and 400 seeds/m<sup>2</sup> regarding yield or quality, 300 & 400 seeds/m<sup>2</sup> achieve the best results. 200 seeds/m<sup>2</sup> gave significantly lower yield and poorer quality.
- Aim to sow around 300-400 seeds/m<sup>2</sup>. Seed rate needs to be adjusted according to seedbed conditions and level of weed burden (as per other cereals).
- Soil moisture and good soil contact is required for germination, if the soil is very wet, germination can be reduced.
- Plant populations do tend to vary from season to season and regionally.
- Oats can compensate for low plant populations through increased tillering & the development of more grains per panicle.



# Cover Crops in Spring Oats

**Background:** The value of soil health and water quality within agricultural systems are now more important than ever with changes in agricultural policies and climate change. Loss of pesticides and tighter regulation of fertiliser use on crops is leading to a greater focus on input requirements to grow crops sustainably whilst maintaining yield and quality. Spring Oats are also becoming a larger part of the Oat area grown due to blackgrass pressure. Cover crops could/do help with all the areas mentioned below:

- a) Can we reduce artificial N input?
- b) Can we improve soil health/structures?
- c) Environmental benefits (reduced cultivations, reduced soil erosion, less nutrient pollution water, improved soil health, reduced fertiliser requirement, biodiversity, beneficial insect benefit in Cover Crops)
- d) Potential savings to farms but without loss of yield and quality
- e) Sustainable farming

**Objective:** To investigate the value of cover crops (non-cereal & non-brassica) in a spring oat rotation with emphasis on soil health and crop nutrition.



# Cover Crops in Spring Oats

## Site Details:

<b>Location:</b>	<b>Winchester</b>
<b>Cover Crop Species:</b>	Buckwheat 10 kg Phacelia 2 kg Linseed 4 kg
<b>Planting Date of CC:</b>	29 <sup>th</sup> August 2019
<b>Cover Crop Seed Rate:</b>	16 kg/ha
<b>Cover Crop Establishment Method:</b>	Straw Removed Direct Drilled Rolled
<b>Previous Rotation:</b>	2019 – Spring Barley 2018 – Winter Wheat 2017 – WOSR 2016 – Cover Crop/Spring Barley
<b>Soil Type:</b>	Andover Series Chalk with Flints

Cover crop sprayed off: 3<sup>rd</sup> March

Elyann direct drilled 31<sup>st</sup> March @ 181 kg/ha aim 350 plants/m<sup>2</sup>







Cover Crop



Stubble



21<sup>st</sup> October 2019



# Soil Health Report

## Stubble

## Cover Crop

23<sup>rd</sup> October

### Soil Chemical Analysis

	Index	Result	Low	Marginal	Target	Marginal	High
P	1	12.0 mg/l					
K	2+	135 mg/l					
Mg	1	29.0 mg/l					
Organic Matter (LOI)		7.5%	Level data not available for this crop				

Soil pH		8.2	Very Acid	Acid	Neutral	Alkali	Very Alkali
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Where no future crop code has been given, levels are calculated assuming an arable crop. If general fertiliser and lime recommendations have been requested, these are given on the following sheets. The analytical methods used are as described in DEFRA Reference Book 427. The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

### Microbial Activity

	Index	Result	Very Low	Low	Moderate-Low	Moderate	High	Very High
CO <sub>2</sub> Burst	4.2	82 mg/kg						

#### Potential N Mineralisation (kg/ha/yr) - Based on CO<sub>2</sub> Burst

Very Low (<15) Low (15-25) Moderate-Low (25-45) Moderate (45-75) **High (75-105)** Very High (105-123)

1<sup>st</sup> April

### Soil Chemical Analysis

	Index	Result	Low	Marginal	Target	Marginal	High
P	2	21.0 mg/l					
K	2+	166 mg/l					
Mg	1	36.6 mg/l					
Organic Matter (LOI)		6.9%	Level data not available for this crop				

Soil pH		8.3	Very Acid	Acid	Neutral	Alkali	Very Alkali
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Where no future crop code has been given, levels are calculated assuming an arable crop. If general fertiliser and lime recommendations have been requested, these are given on the following sheets. The analytical methods used are as described in DEFRA Reference Book 427. The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

### Microbial Activity

	Index	Result	Very Low	Low	Moderate-Low	Moderate	High	Very High
CO <sub>2</sub> Burst	4.3	89 mg/kg						

#### Potential N Mineralisation (kg/ha/yr) - Based on CO<sub>2</sub> Burst

Very Low (<15) Low (15-25) Moderate-Low (25-45) Moderate (45-75) **High (75-105)** Very High (105-123)

23<sup>rd</sup> October

### Soil Chemical Analysis

	Index	Result	Low	Marginal	Target	Marginal	High
P	1	14.2 mg/l					
K	2+	187 mg/l					
Mg	1	29.4 mg/l					
Organic Matter (LOI)		8.7%	Level data not available for this crop				

Soil pH		8.6	Very Acid	Acid	Neutral	Alkali	Very Alkali
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Where no future crop code has been given, levels are calculated assuming an arable crop. If general fertiliser and lime recommendations have been requested, these are given on the following sheets. The analytical methods used are as described in DEFRA Reference Book 427. The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

### Microbial Activity

	Index	Result	Very Low	Low	Moderate-Low	Moderate	High	Very High
CO <sub>2</sub> Burst	4.2	82 mg/kg						

#### Potential N Mineralisation (kg/ha/yr) - Based on CO<sub>2</sub> Burst

Very Low (<15) Low (15-25) Moderate-Low (25-45) Moderate (45-75) **High (75-105)** Very High (105-123)

1<sup>st</sup> April

### Soil Chemical Analysis

	Index	Result	Low	Marginal	Target	Marginal	High
P	2	18.6 mg/l					
K	2+	168 mg/l					
Mg	1	35.5 mg/l					
Organic Matter (LOI)		8.1%	Level data not available for this crop				

Soil pH		8.0	Very Acid	Acid	Neutral	Alkali	Very Alkali
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Where no future crop code has been given, levels are calculated assuming an arable crop. If general fertiliser and lime recommendations have been requested, these are given on the following sheets. The analytical methods used are as described in DEFRA Reference Book 427. The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

### Microbial Activity

	Index	Result	Very Low	Low	Moderate-Low	Moderate	High	Very High
CO <sub>2</sub> Burst	4.6	115 mg/kg						

#### Potential N Mineralisation (kg/ha/yr) - Based on CO<sub>2</sub> Burst

Very Low (<15) Low (15-25) Moderate-Low (25-45) Moderate (45-75) **High (75-105)** Very High (105-123)

# Cover Crop Analysis- December 3rd

Analysis	Result 0.5 m2
Nitrogen %	2.93
Phosphorous %	0.47
Potassium %	2.68
Calcium %	4.39
Magnesium %	0.13
Sulphur %	0.27
Boron ppm	22.6
Copper ppm	7.0
Iron ppm	338
Manganese ppm	108
Molybdenum ppm	0.53
Zinc ppm	28.6
Dry Matter %	16.43
Fresh Weight g	181.7

*Average of 3x 0.5m2 quadrats*

**Dry Weight (t/ha)**  
**0.6**

**Total N Kg N/Ha**  
**35**

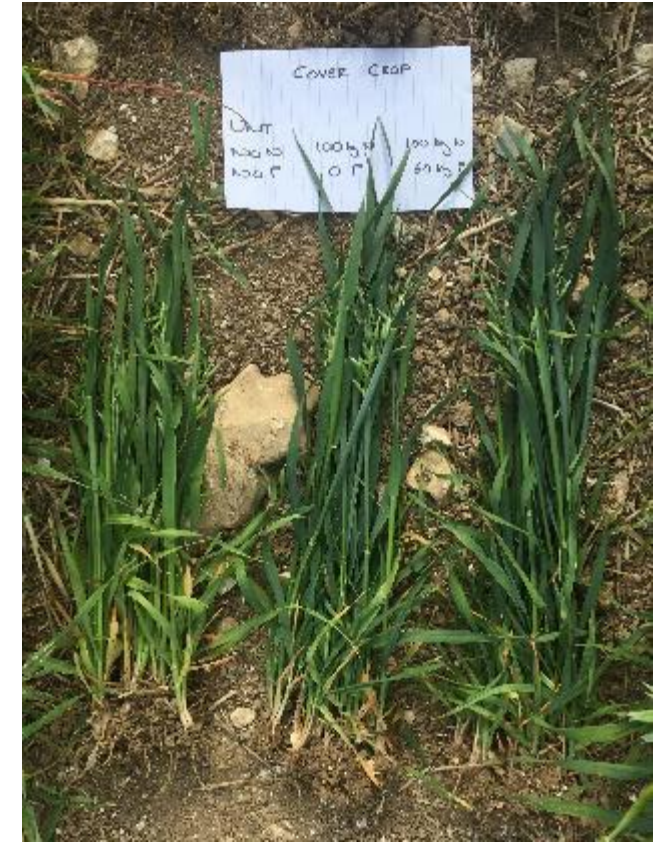


No Buckwheat left at time of sampling.

Higher the FW, lower the Iron level

Higher the FW, higher the N, P, K, Ca, S, Bo, Cu, Mo & Zn





9<sup>th</sup> June 2020





9<sup>th</sup> June 2020

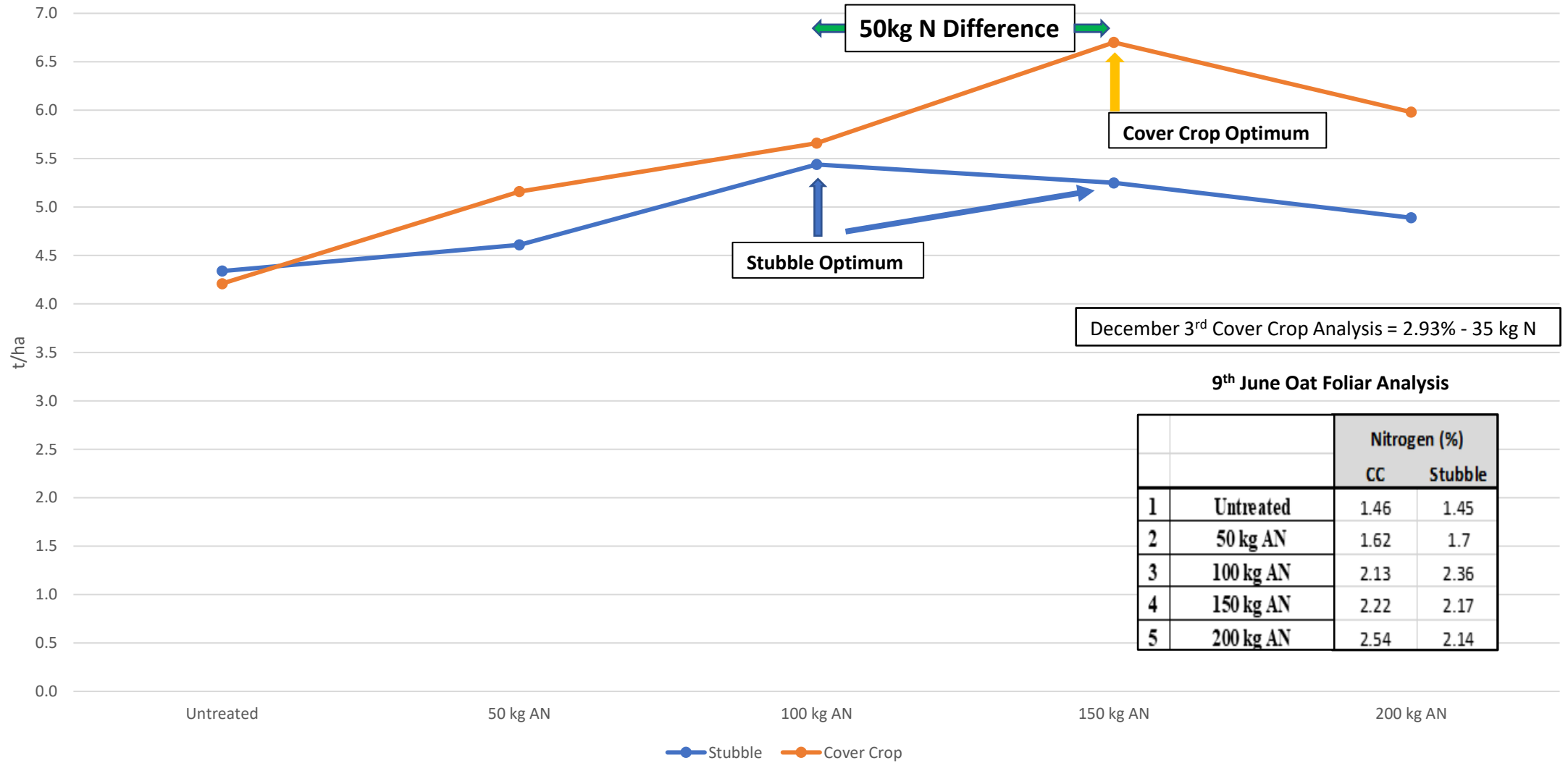


		COVER CROP					
		FW 0.1m2 g	P Inc. in g over trt 3	DM 0.1m2 g	Dry Wt t/ha	Total N Kg N/ha	Total P Kg P/ha
1	Untreated	115		27.1	3.1	46	6.8
2	50 kg AN	129		25.7	3.3	54	8.3
3	100 kg AN	133	0	22.9	3.1	65	8.1
4	150 kg AN	156		22.8	3.6	79	9.7
5	200 kg AN	150		22.7	3.4	87	7.5
6	30 kg P + 100 kg N	156	+23g	23.6	3.7	78	8.5
7	60 kg P + 100 kg N	194	+61g	23.1	4.5	105	12.2
8	90 kg P + 100 kg N	201	+68g	22.9	4.6	102	11
9	120 kg P + 100 kg N	190	+57g	23.5	4.5	96	10.8
		STUBBLE					
		FW 0.1m2 g	P Inc. in g over trt 3	DM 0.1m2 g	Dry Wt t/ha	Total N Kg N/ha	Total P Kg P/ha
1	Untreated	91		26.5	2.4	35	5.5
2	50 kg AN	96		25.4	2.4	41	5.8
3	100 kg AN	104	0	24.2	2.5	59	6
4	150 kg AN	96		25.2	2.4	53	5
5	200 kg AN	97		25.9	2.5	54	4.8
6	30 kg P + 100 kg N	119	+15g	25.3	3.0	67	6
7	60 kg P + 100 kg N	132	+28g	24.8	3.3	83	7.3
8	90 kg P + 100 kg N	126	+22g	25.1	3.2	73	6.4
9	120 kg P + 100 kg N	100	-4g	23.9	2.4	66	5.8

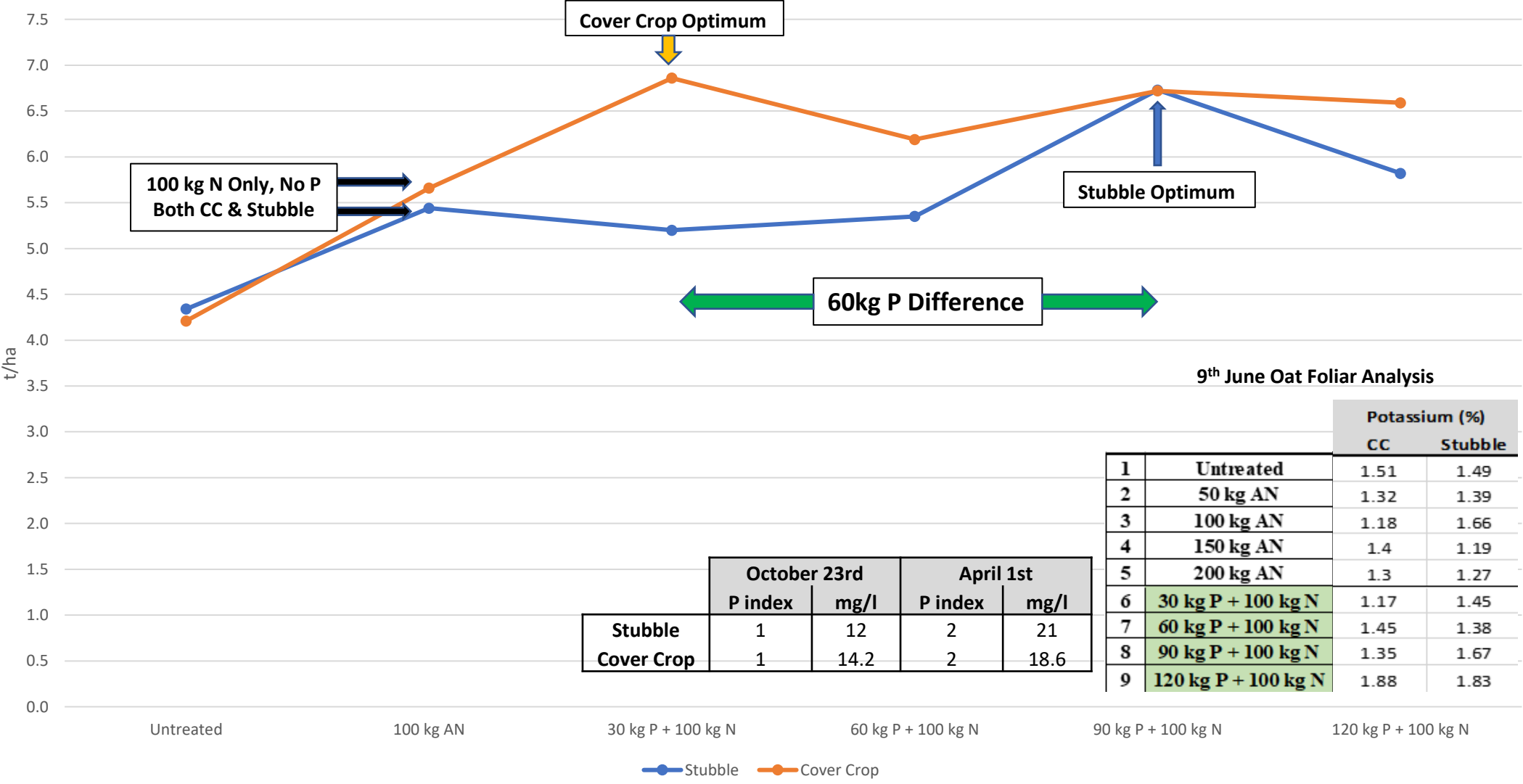


9<sup>th</sup> June Samples collected for analysis

# N Dose Yield t/ha Comparison



# P Dose Yield t/ha Comparison



# Key Points:

- Limited data as only 1 year to date, grain quality data still to complete & much of the data to be interpreted.
- Increased soil organic matter
- Although no visual differences across field, pulling plants showed a clear response, greater biomass/fresh weight, clear visual response to Phosphate
- Data clearly shows the cover crop has supplied N & P to the crop with positive results
- Optimum N required to achieve yield in the stubble area was between 100-150kg, for the cover crop area 150 kg (1.45t/ha increase in CC yield @ 150kg comparison). CC average N yield 5.88 t/ha, 5.04 t/ha in stubble
- Optimum P required to achieve yield in the stubble area was 90 kg, for the cover crop area 30 kg. CC average P yield 6.59 t/ha, 5.78 t/ha in stubble.





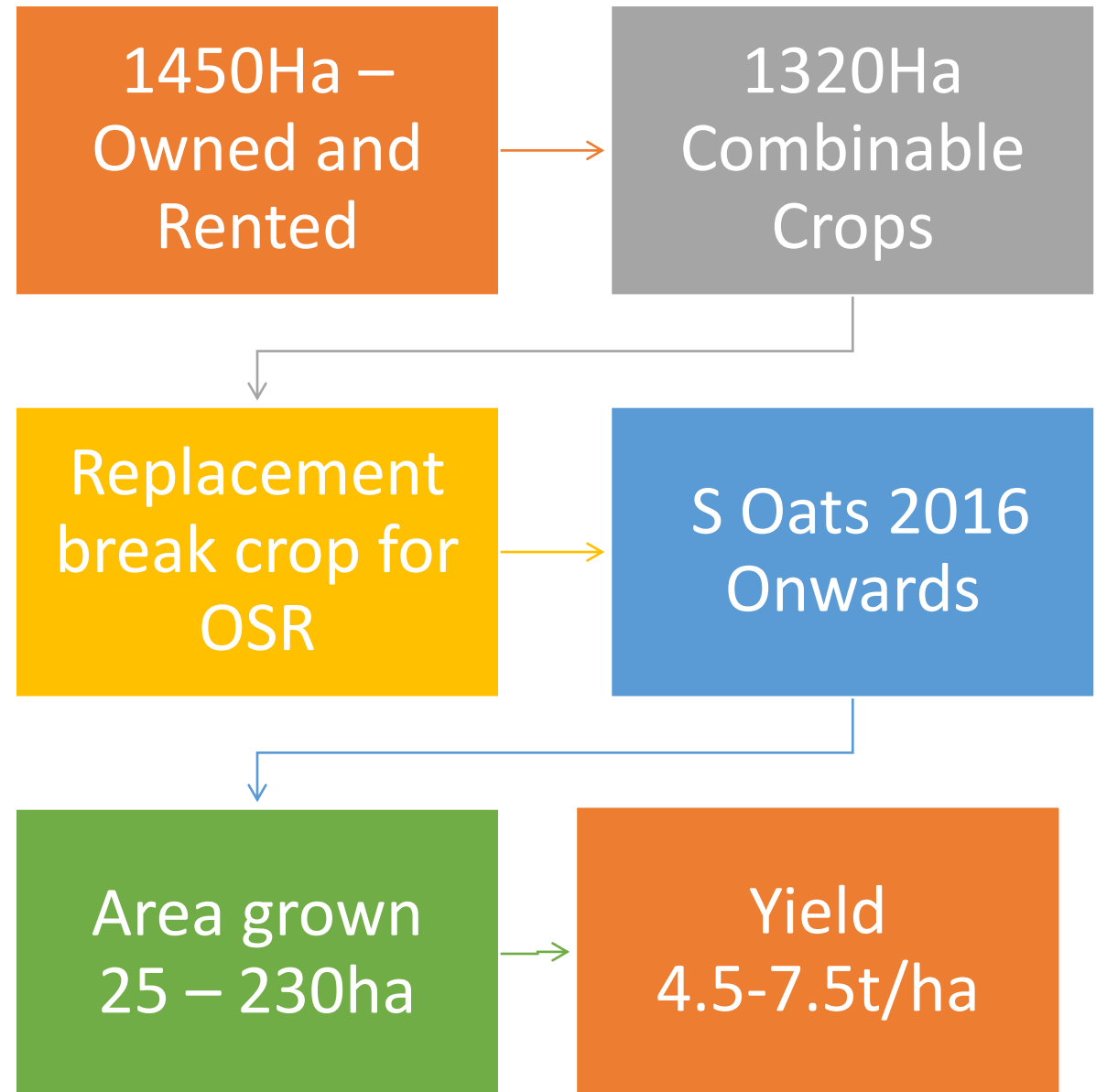


# Spring Oat Forum 6<sup>th</sup> January 2021

Ian Lutey



# R H TOPHAM & SONS LTD



# Marketing



Small market – Do you know  
what your buyer wants?



Contract or Open Market?



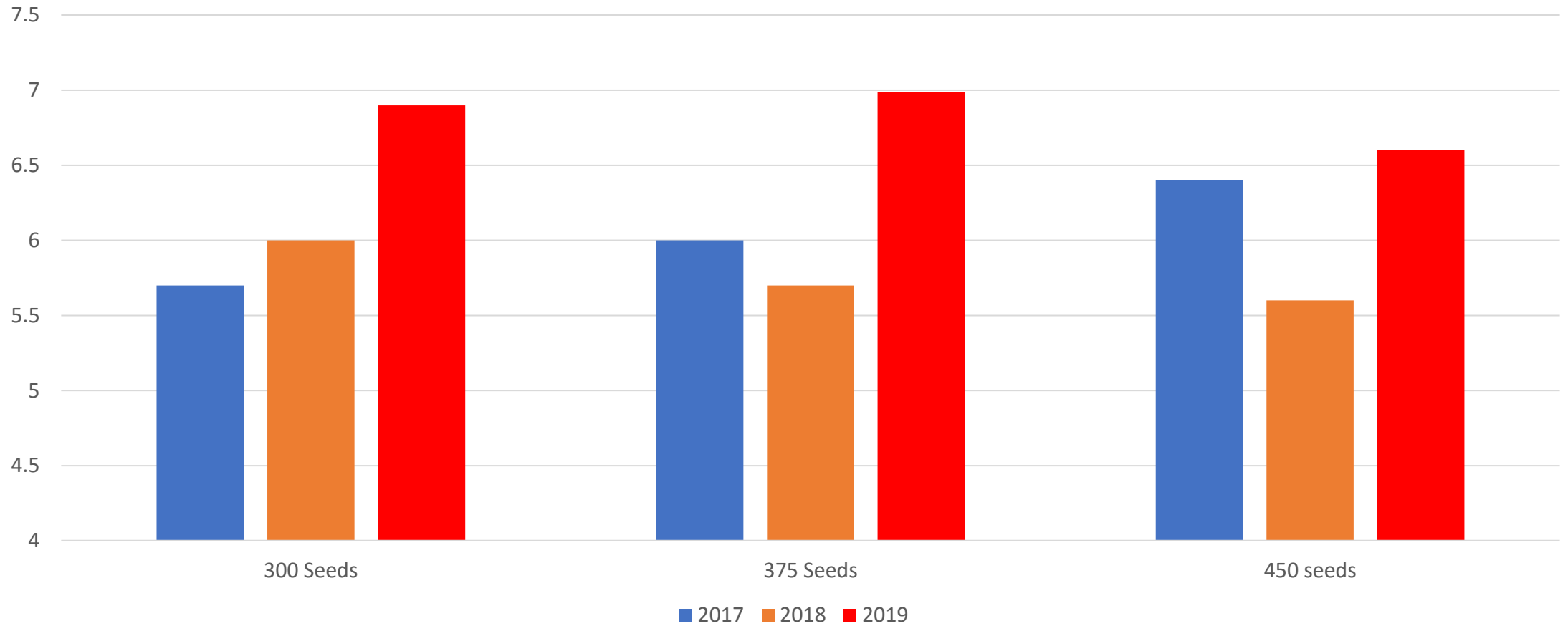
Variety vs Yield



# KEY POINTERS

- 1) Establishment
- 2) Nutrition
- 3) Weed control
- 4) Growth Regulation
- 5) Harvesting

# Seed Rate/Yield Performance on Spring Oats (Elyann)



# SWOT ANALYSIS OF SPRING OAT GROWING

<b>Blackgrass competitive</b> <b>Spring break crop – spreading workload</b> <b>Cheap to grow</b> <b>Lower risk crop than OSR</b> <b>Take all break</b> <b>Resilient crop</b> <b>Growing demand – health</b>	<b>Prone to suffering from Spring droughts</b> <b>Spring Oats not 1<sup>st</sup> choice oat for Millers</b> <b>Price taker – to a large extent</b> <b>Lack of good growing contracts/risk management</b> <b>Risk of failure to make milling specification</b> <b>Historically Boom/bust crop</b> <b>Straw/standing ability</b> <b>Volunteers in following wheat crop can be problematic</b>
Very little research/data on the crop On farm/trials to push performance significantly higher Nitrogen regime to be further looked at Improve the crops resilience – seed rate/drill date etc Improve nutrition of the crop to support hl/weight	Oversupply Weather – droughts and harvest storms (2020) Profitability of other break crops

# Questions





# ***Modern spring oat varieties – what is important to know when growing them?***

Dr. Steffen Beuch, NORDSAAT Saatzeit GmbH,  
Zuchtstation Granskevitz/Rügen (Germany)

Spring oat forum of the AHDB and Gowlett Grain  
Online (GoTo Webinar), 06/01/2021



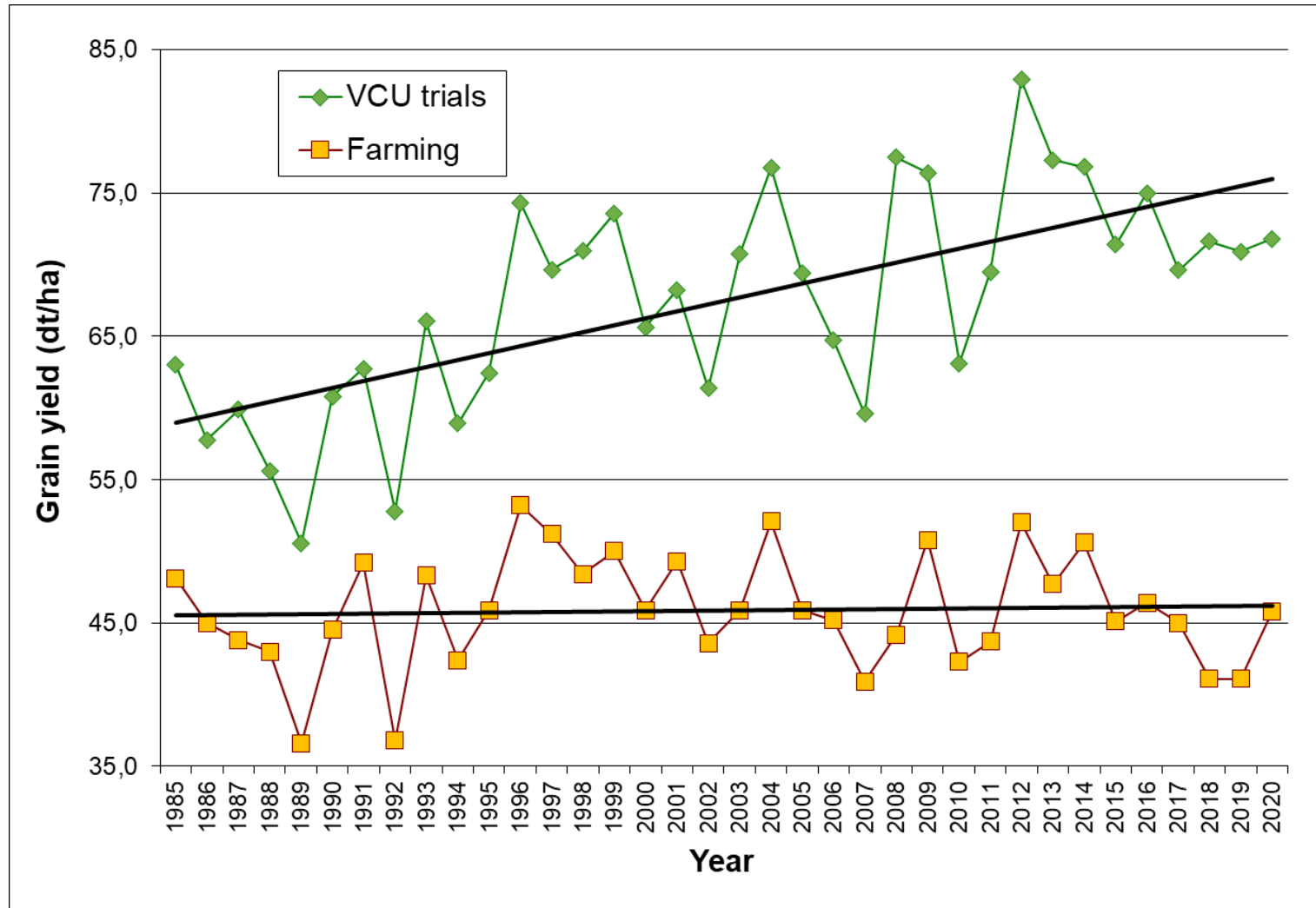


# Oat breeding at NORDSAAT



- Oat farming, selection and breeding since 1910.
- Europe's most extensive and successful spring oat breeding.
- NORDSAAT's oat varieties cover one fourth of the whole European spring oat growing.
- Separate oat variety selection strategies for Central, Northern, Western, Eastern and Southern Europe.
- Application of state of the art plant breeding technology to oats based on cooperation (JKI, IPK, GFPI, Saaten-Union Biotech, German Seed Alliance, IBERS – Aberystwyth, UK).
- Close contact to all other partners in the European oat value chain (i.e. millers, traders, advisors, farmers etc.).

# Yield of oats in Germany 1985-2020

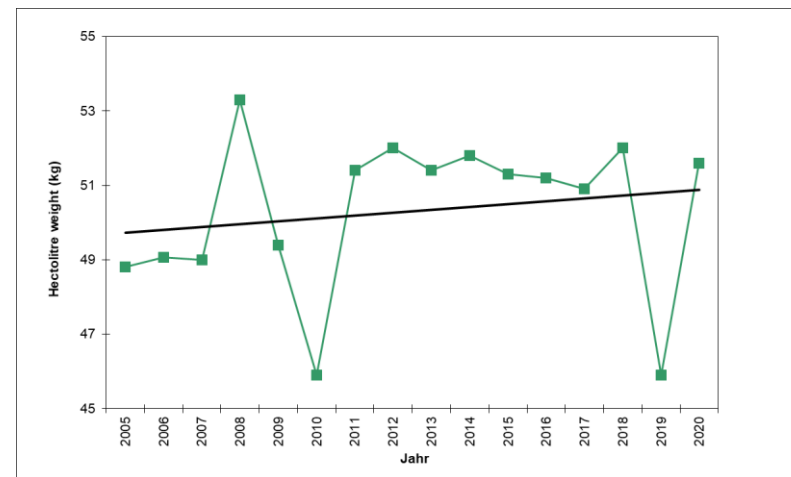
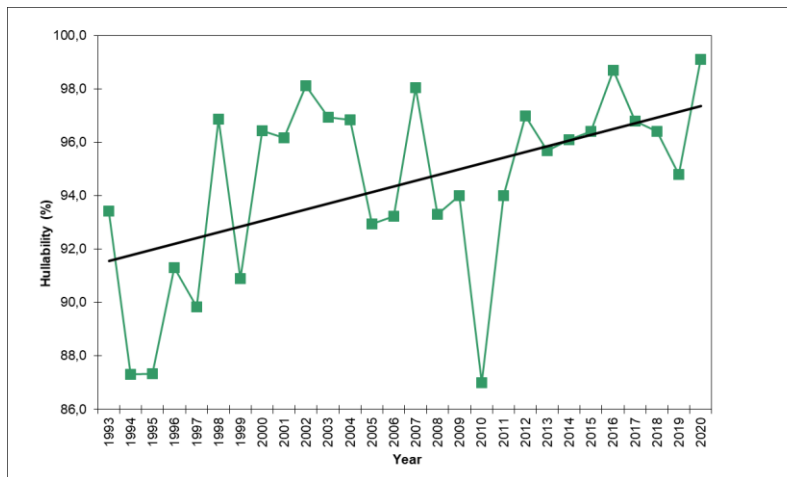
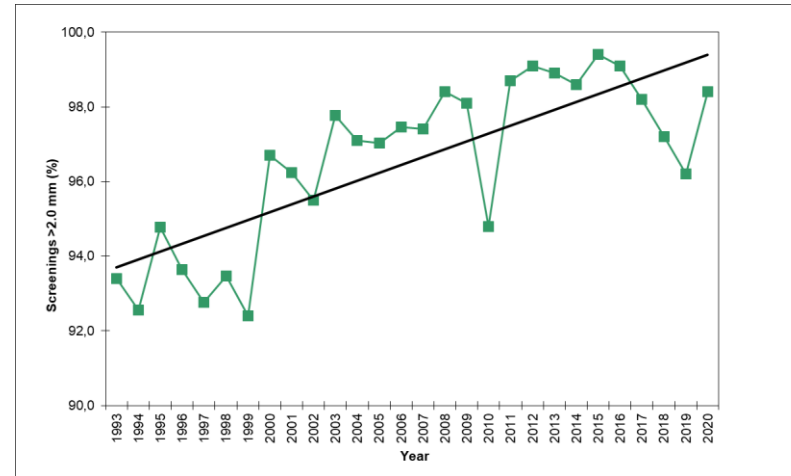
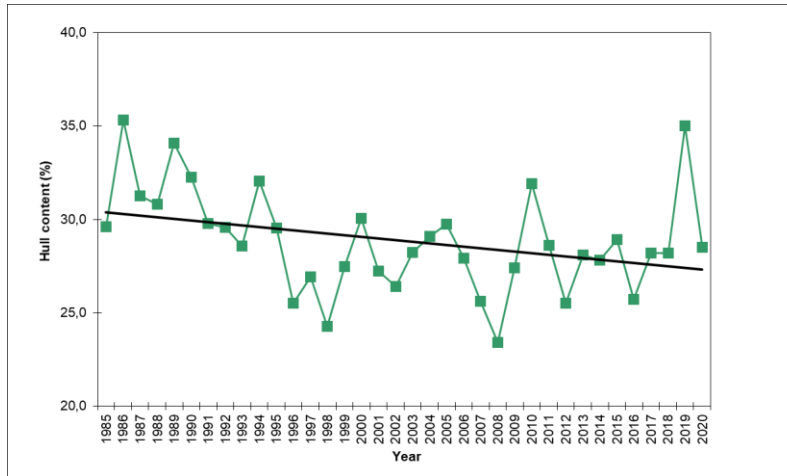


Sources: Bundessortenamt, destatis

**DESTATIS**  
Statistisches Bundesamt



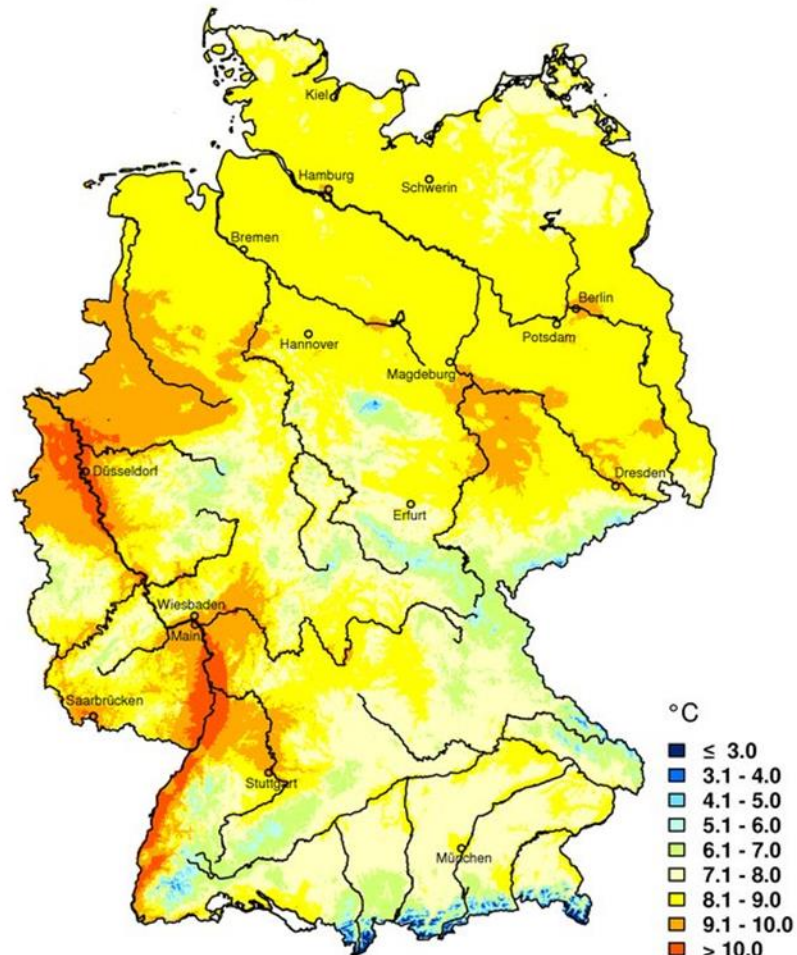
# Grain quality of oats in Germany 1985-2020



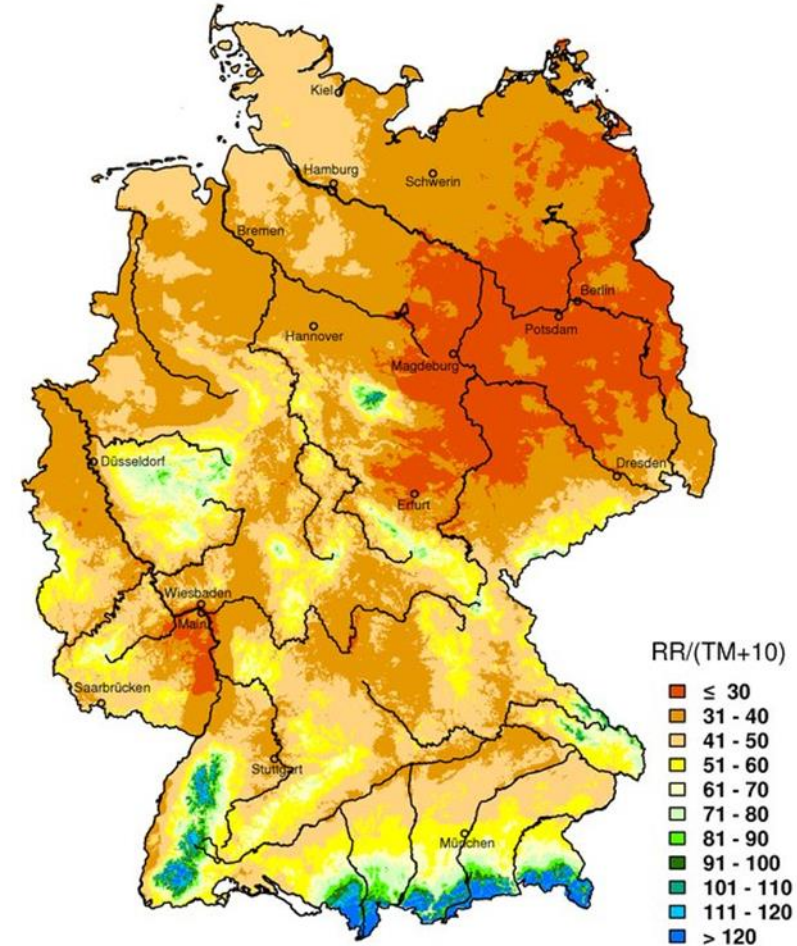
Source: Spring oat VCU trials Bundessortenamt

# Growing conditions for oats in Germany

Lufttemperatur Jahr  
vielfähriger Mittelwert 1961-1990  
Temperature Year  
long-term mean 1961-1990

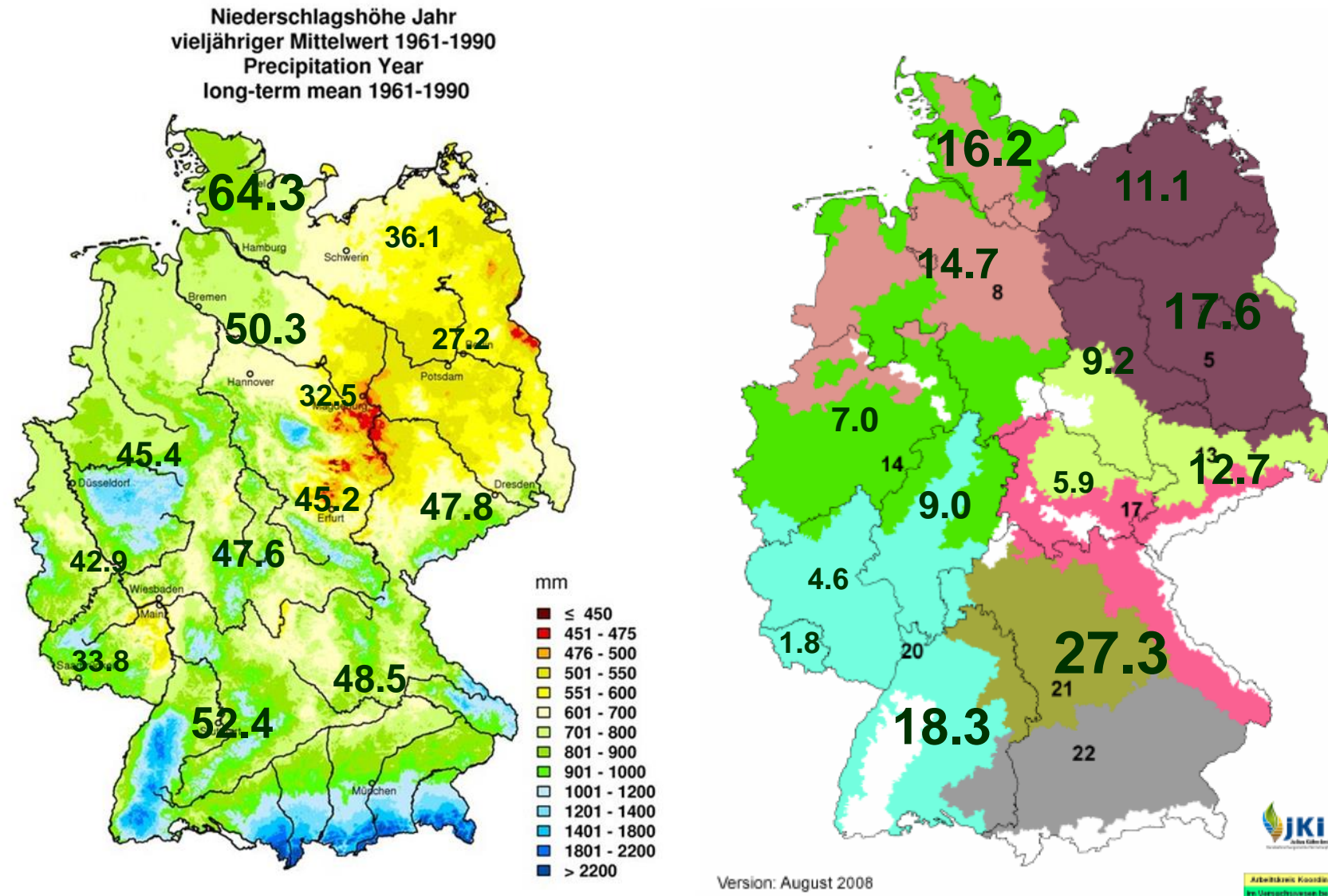


Trockenheitsindex Jahr  
vielfähriger Mittelwert 1961-1990  
Aridity Index Year  
long-term mean 1961-1990





# Growing conditions for oats in Germany



Data source: German Official Statistics 09/2020 (left side: yield dt/ha 2020; right side: cropping area 1,000 ha 2020)



# Yield and quality of oats 2010-2020

(Variety SYMPHONY, Data source: treated VCU trials Bundessortenamt)

	Region			
Character	All	North-West	North-East	South-West
	(n=125)	(n=36)	(n=44)	(n=45)
Grain yield (dt/ha)	76.1	82.6	74.6	72.3
Hectolitre weight (kg)	50.7	50.0	50.4	51.3
Hull content (%)	28.4	29.0	28.5	28.3
Screenings >2.0 mm (%)	98.8	99.0	97.9	99.1
Hullability (%)	93.9	94.7	90.8	96.0
Sowing to panicle emergence (days)	81	82	79	81
Panicle emergence to yellow ripening (days)	40	43	38	38
Sowing to harvest (days)	137	140	133	138

# Coefficients of correlation 2010-2020 DE

(Variety SYMPHONY, Data source: treated VCU trials Bundessortenamt)

	Coefficients of correlation (0-1)								
Trait	Yield	HL weight	Hull content	Scr. >2.0 mm	Hullability	Sowing date	Date of pan. emerg.	Date of yellow ripen.	Date of harvest
Yield	1.0	0.24	-0.40	0.47	0.33	-0.20	-0.17	0.01	-0.13
HL weight		1.0	-0.67	0.52	0.35	-0.30	-0.12	-0.06	-0.14
Hull content			1.0	-0.51	-0.31	0.14	0.04	-0.10	-0.01
Scr. >2.0 mm				1.0	0.60	-0.33	-0.01	0.28	0.29
Hullability					1.0	-0.21	-0.16	0.09	0.20

# Coefficients of correlation 2010-2020 N-W

(Variety SYMPHONY, Data source: treated VCU trials Bundessortenamt)

	Coefficients of correlation (0-1)								
Trait	Yield	HL weight	Hull content	Scr. >2.0 mm	Hullability	Sowing date	Date of pan. emerg.	Date of yellow ripen.	Date of harvest
Yield	1.0	0.34	-0.40	0.43	-0.20	-0.28	-0.06	-0.04	-0.09
HL weight		1.0	-0.76	0.40	-0.10	-0.37	-0.46	-0.30	-0.45
Hull content			1.0	-0.39	0.04	0.12	0.06	-0.03	0.14
Scr. >2.0 mm				1.0	0.19	-0.30	-0.03	0.29	0.23
Hullability					1.0	-0.31	0.24	-0.05	-0.07

# Summary and remarks 1

- There is potential for higher and more stable spring oat yield and quality when using the actual breeding progress.
- Yield and quality of spring oats are highly dependent from environmental aspects.
- Maritime growing conditions offer highest yield and good quality potential due to its longer lasting growing period. However, HL-weight and kernel content can be lower.
- Continental growing conditions with shorter vegetation can lead to lower grain yield and grain quality. Nevertheless, kernel colour and kernel content can be still very sufficient.
- “French” growing conditions regularly result in a medium to high grain yield and a good overall grain quality. Problems to get a high level of grain quality increase under hot, dry and short grain filling conditions.

## Summary and remarks 2

- There is relative close positive correlation between spring oat grain yield and characters of grain quality as well as between the grain quality traits itself.
- Grain yield of spring oats can be higher at early sowing and youth development. Avoid a delayed harvest.
- In potential high yielding areas, HL-weight and screenings get profits by a long vegetation period. Early sowing has a positive effect, especially.
- Higher kernel content can be achieved not so easy. Early sowing and long time for grain filling can have a quite positive impact.
- Hullability is regularly determined by the growing conditions between panicle emergence and harvest.
- Consider the possible regional differences – know your location, do field trialing and have realistic expectations!



A close-up photograph of green oat plants in a field. The oat heads are prominent, showing their characteristic ribbed structure. In the background, there are more green plants, some trees, and a blue sky with light clouds. A semi-transparent light green rectangular box is centered over the image, containing the text "Thank you for your attention!" in a bold, dark green font.

**Thank you for your  
attention!**



Gowlett  
Grain

AHDB



# Spring Oat Forum - Discussion

# Poll

Following today's session, I will focus on the following for harvest 2021...

- Yield
- Quality
- Agronomy
- Marketing
- Achieving specification



# Forum summary and take-home messages

*Gordon Gowlett*



# Further information

# Resources

- Oat Growth Guide
- Recommended List: [ahdb.org.uk/rl](http://ahdb.org.uk/rl)
- NOATS Project
- PhD: Identification of fusarium resistance within UK oat breeding lines (21130012)
- NEW: Oat YEN for 2021



# Thank you



REC ●



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