Rapeseed in the UK – Learnings for a Changing Climate

Webinar – 13/12/23

LSPB
COMBINING EXCELLENCE

AGENDA

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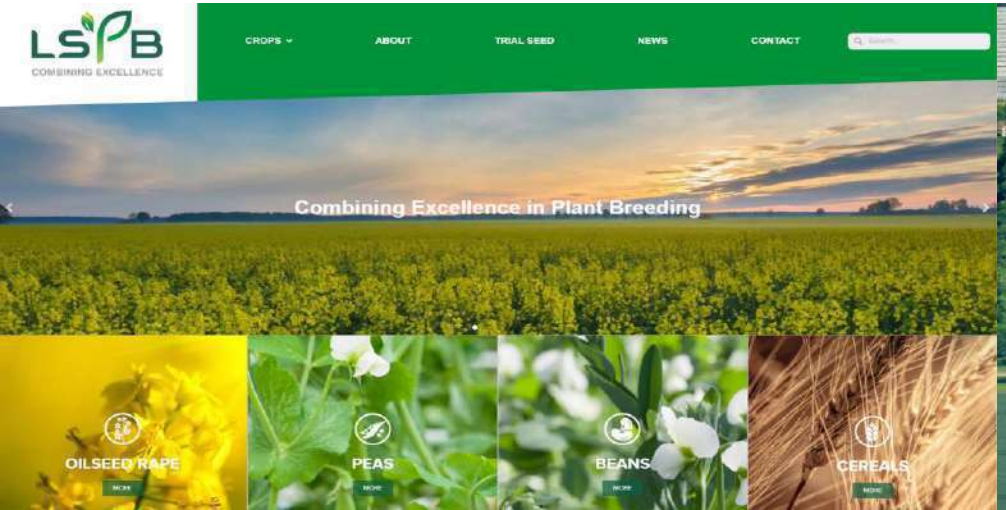
- Introduction
  - Chris Guest
- Updates & Changes to the new AHDB RL – a breeder's perspective
  - Dr. Andreas Girke, WOSR Breeder, NPZ
- Rapeseed in the UK – Setting the Scene/Challenge
  - Chris Guest
- Development of OSR in a maritime climate
  - Prof. Dr. Ute Kropf, University of Applied Sciences, Kiel
- Summary & Conclusion
- Questions?

WHO ARE WE?

- UK based plant breeding company – wholly owned by NPZ
- UK breeding programme for oilseed rape, beans and peas
- UK agency for spring wheat.
- LSPB wheat breeding programme with WvB Eckendorf and Wiersum Plant Breeding.



LSPB IMPINGTON

CORE VALUES

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Innovation

- Introduced Clubroot resistance to the OSR market
- NPZ invented MSL hybrid system
- Bringing new LVC traits to revolutionise bean markets
- New Phoma resistance trait RlmS

Excellence

- Breeding OSR varieties specifically for UK conditions
- High yielding OSR varieties on RL – Turing/Murray/Vegas
- Top yielding yellow & green peas
- Representing high yielding spring wheat

Transparency

- Honesty in all aspects of our work.
- Open dialogue with all sectors of the supply chain
- Data backed marketing

WHO ARE NPZ?

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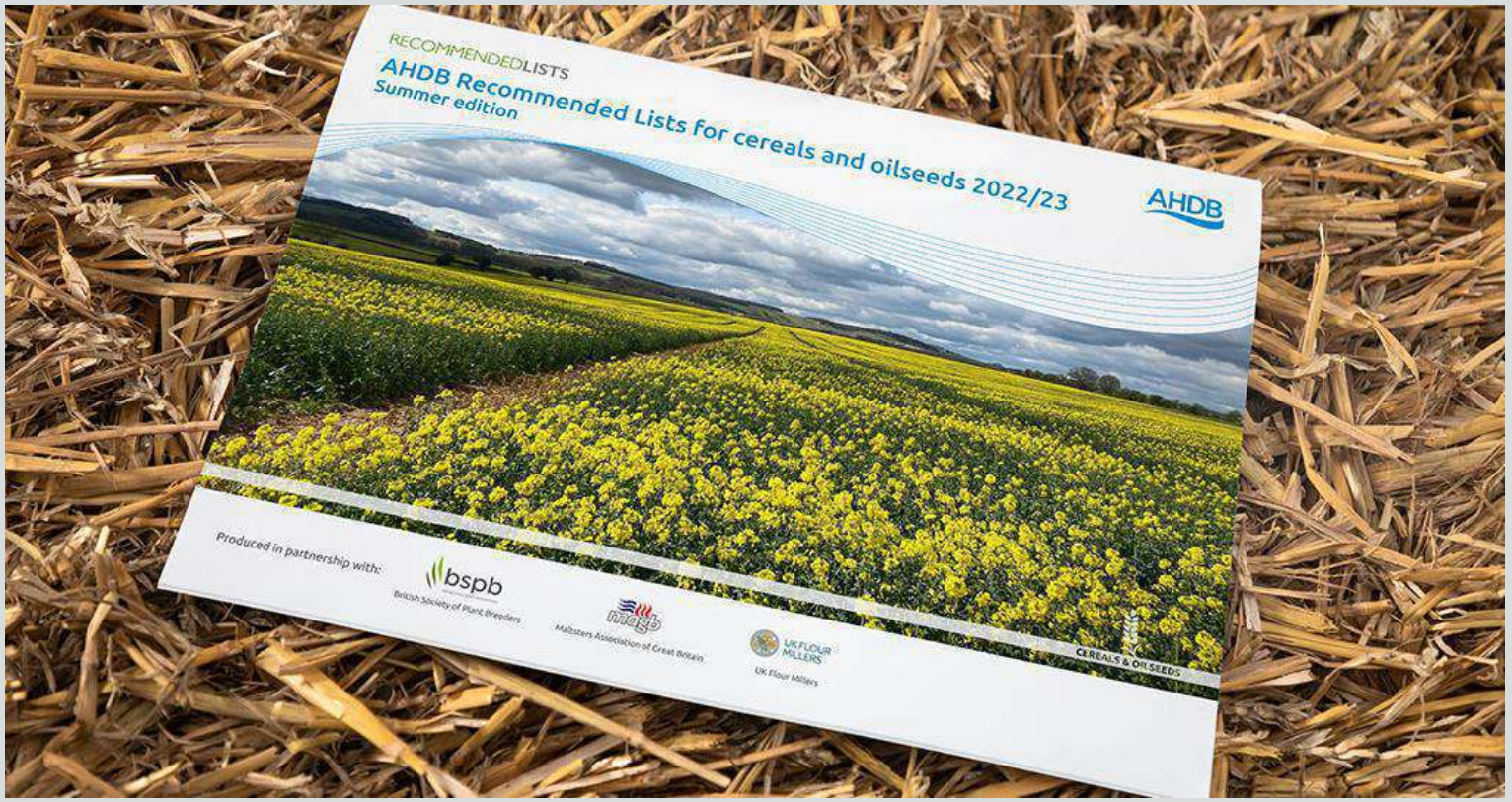
- NPZ are a medium sized, privately owned German plant breeding company – located at two stations in Northern Germany
- Founded in 1897
- NPZ is a leading breeder of oilseed rape, field beans and field peas with a long track record of breeding successful varieties for the UK grower.
- Their philosophy is to keep the best of a traditional approach while investing in the latest technologies in plant breeding.

NPZ MALCHOW-POEL

NPZ HOHENLIETH

What can we learn from the new edition of Recommended list?“



Dr. Andreas Girke

Winter Rapeseed Breeder at Norddeutsche Pflanzenzucht

Online Seminar of LSPB, 13th of December 2023

Impact of Recommended lists in Europe

- Based on the last survey from AHDB (2022) major feedback was: *„that almost all aspects of our commercial and politically independent work are valuable…"*
  - *AHDB's Recommended Lists, which gives levy payers the opportunity to compare varieties on an independent, consistent and fair basis, was ranked as the most important work that we fund.*
- Similar approach is running in Czech Republic by SPZO
  - Instead of fungicide focus (treated/untreated), varieties are tested under warm/cold conditions (weather)
- In both cases, trial experiences are base for commercial variety decisions

https://ahdb.org.uk/sector-plans/cereals-oilseeds

AHDB Recommended list 2024/25

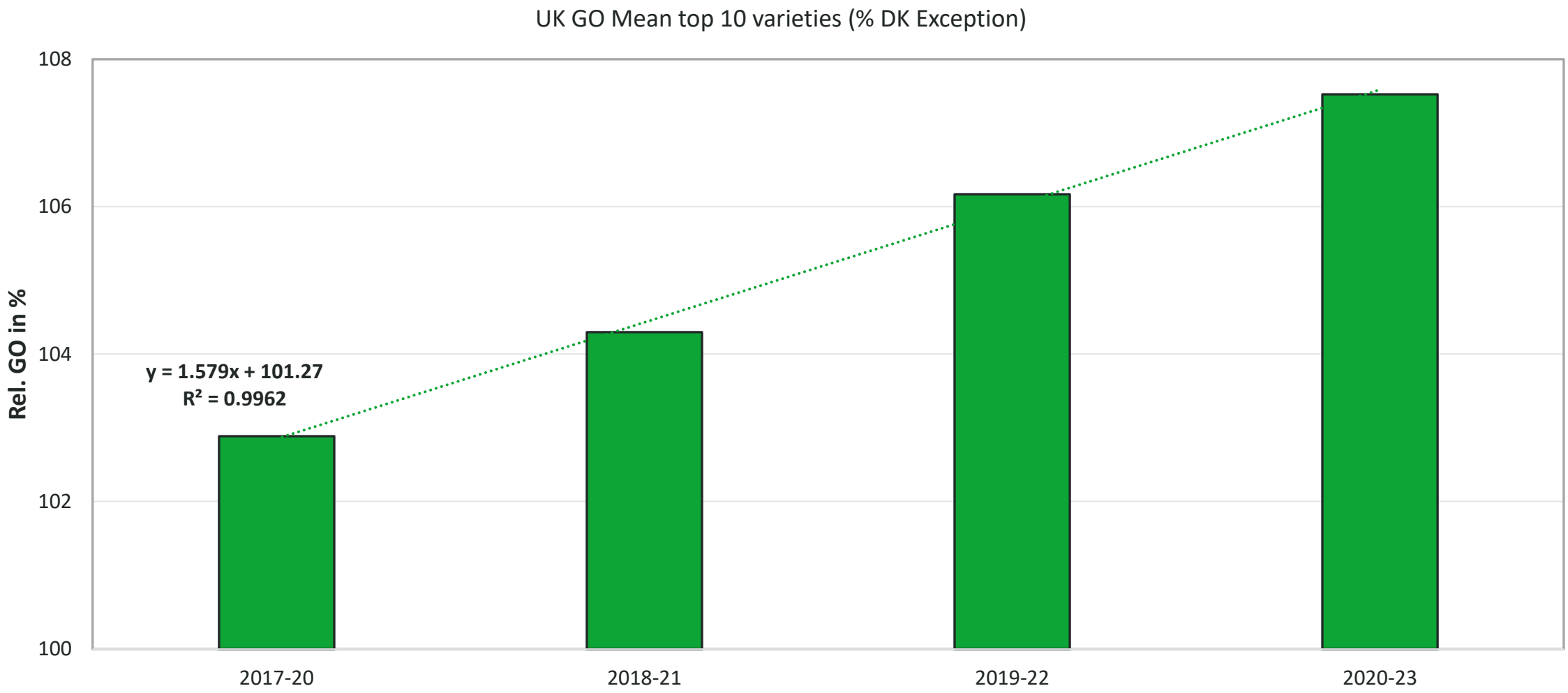
AHDB RECOMMENDED

	LG Armada	LG Academic	LG Adeline [1]	Turing	Dolphin	LG Auckland	Attica	Murray	Vegas	Ambassador	LG Wagner	Aurelia	LG Aviron	LG Adonis	PT303	Dart	Tennyson
	Hybrid																
Variety type	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid	Hybrid
Scope of recommendation	UK	UK	UK	UK	E/W	E/W	UK	E/W	UK	E/W	N	UK	UK	E/W	UK	E/W	E/W
Variety status	NEW	NEW	NEW		NEW					C		C	*	*	*	*	*
Gross output, yield adjusted for oil content (% treated control)																	
United Kingdom (5.1 t/ha)	107	106	106	106	*105*	*105*	105	*105*	104	*104*	*103*	103	102	*101*	101	*99*	*96*
East/West region (5.0 t/ha)	106	106	106	106	106	105	105	105	104	104	*102*	103	102	101	101	100	97
North region (6.0 t/ha)	107	107	108	105	*[102]*	*103*	104	*102*	102	*101*	108	102	103	*100*	100	*92*	*93*
Seed yield (% treated control)																	
United Kingdom (4.8 t/ha)	106	106	106	107	*103*	*104*	105	*105*	104	*104*	*103*	103	103	*100*	100	*99*	*96*
East/West region (4.7 t/ha)	106	106	106	107	103	105	105	106	104	104	*102*	103	103	100	100	100	97
North region (5.5 t/ha)	107	107	109	107	*[100]*	*102*	104	*103*	102	*102*	108	103	104	*99*	100	*92*	*94*
Untreated yield (% untreated control) – UK																	
Gross output (5.3 t/ha)	-	-	-	103	-	105	102	105	106	103	[106]	104	105	102	100	96	94
Seed yield (4.9 t/ha)	-	-	-	104	-	104	102	105	105	103	[106]	104	107	101	100	96	94
Disease resistance																	
Light leaf spot (1–9)	7	7	7	7	6	7	7	7	7	7	7	7	7	7	7	7	7
Stem canker (1–9)	6	6	6	4	7	5	5	8	9	6	5	5	6	6	6	5	7
Verticillium	-	-	-	I	[MR]	[I]	[S]	[MR]	[I]	S	[S]	[I]	[S]	[MR]	-	[I]	[MR]
TuYV	R	R	R	-	R	R	R	-	-	R	R	R	R	R	R	R	R
Agronomic features																	
Resistance to lodging (1–9)	[8.0]	[7.9]	[8.0]	[7.9]	[8.0]	[7.8]	[7.9]	[8.0]	[7.9]	[8.0]	[8.0]	[7.9]	[7.8]	[7.9]	[7.9]	[7.9]	[7.8]
Stem stiffness (1–9)	8	8	8	8	9	7	8	9	8	8	8	7	7	8	[8]	8	8
Shortness of stem (1–9)	5	5	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6
Plant height (cm)	152	152	150	142	143	148	148	148	143	146	142	143	147	140	157	143	143
Earliness of flowering (1–9)	5	7	7	8	7	7	7	7	7	7	7	7	8	7	5	7	6
Earliness of maturity (1–9)	5	5	5	5	4	5	5	5	5	6	5	5	6	5	5	5	5
Pod shatter resistance	R	R	R	-	-	R	R	-	-	R	R	R	R	-	-	-	-

- **New:** LG Armada, LG Academic, LG Adeline & Dolphin
- Varieties no longer listed: Crossfit, DK Expectation, DK Imprint CL, Flemming, LG Antigua, PT279CL, Respect and V316 OL
- (*) varieties no longer in the trials: LG Aviron, LG Adonis, PT303, Dart and Tennyson

https://ahdb.org.uk/knowledge-library/recommended-lists-for-cereals-and-oilseeds-rl

Yield progress is visible!



https://ahdb.org.uk/knowledge-library/recommended-lists-for-cereals-and-oilseeds-rl

Remarks from RL 2024/25: Verticillium stem stripe & stem canker

- Verticillium stem stripe (*Verticillium longisporum)* first time on the list
  - Classification of the tested varieties in several categories: susceptible, moderately resistant or intermediate
  - Currently limited data for most of the varieties
  - The need for this disease data based on previous RL review

- Reset of Phoma stem canker *(Leptosphaeria maculans)* ratings
  - Reaction to a resistance shift over recent years
  - Important: new figures do not mean a change in varietal resistance, more an improvement in the rating calculation process

https://ahdb.org.uk/news/the-new-recommended-lists-rl-is-leaner-and-meaner

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Verticillium	-	-	-	I	[MR]	[I]	[S]	[MR]	[I]	S	[S]	[I]	[S]	[MR]	-	[I]	[MR]
TuYV	R	R	R	-	R	R	R	-	-	R	R	R	R	R	R	R	R
Agronomic features																	
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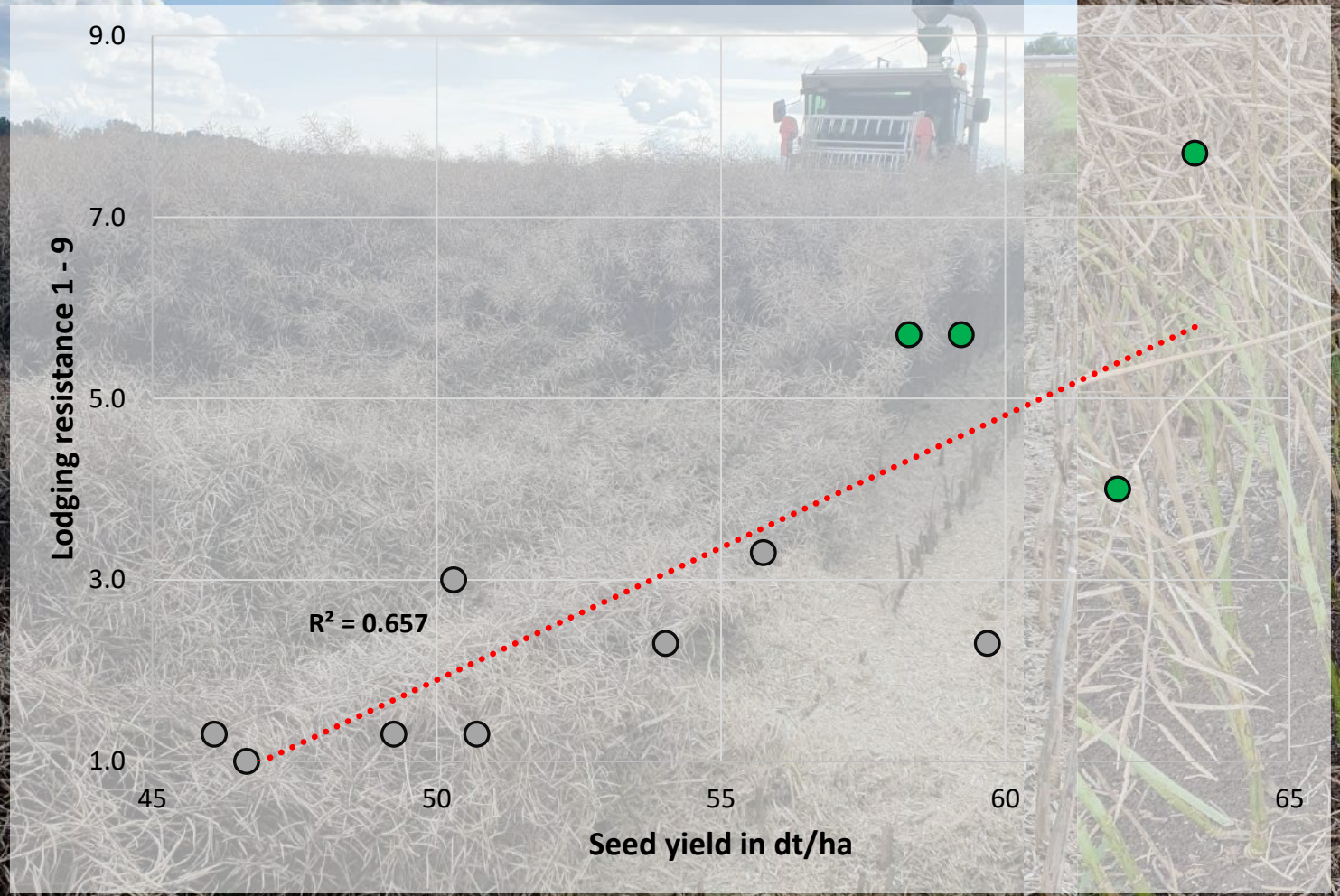
Earliness of maturity (1–9)	5	5	5	5	4	5	5	5	5	6	5	5	6	5	5	5	5
Pod shatter resistance	R	R	R	-	-	R	R	-	-	R	R	R	R	-	-	-	-

https://ahdb.org.uk/knowledge-library/recommended-lists-for-cereals-and-oilseeds-rl


Susceptible
Healthy


No stem health = no standability!
Susceptible
Healthy

No stem health = no standability!



Healthy

Status Quo and open questions:

- The value of “Recommended list” is still “up to date”
- Discrepancy between trial results in Recommended lists and practice
- Continous exchange of the recommended portfolio
- Change from “pure” yield testing to wider solutions
  - New highlights: Adaptation in stem canker and adding Verticillium stem stripe to the new list
- Future trend to more agronomy solutions?
- Open question: 2 fungicide approach still right? What about 2 different harvest dates as alternative for Pod-shatter resistance “claims”…

OSR IN THE UK

CHALLENGING SITUATION

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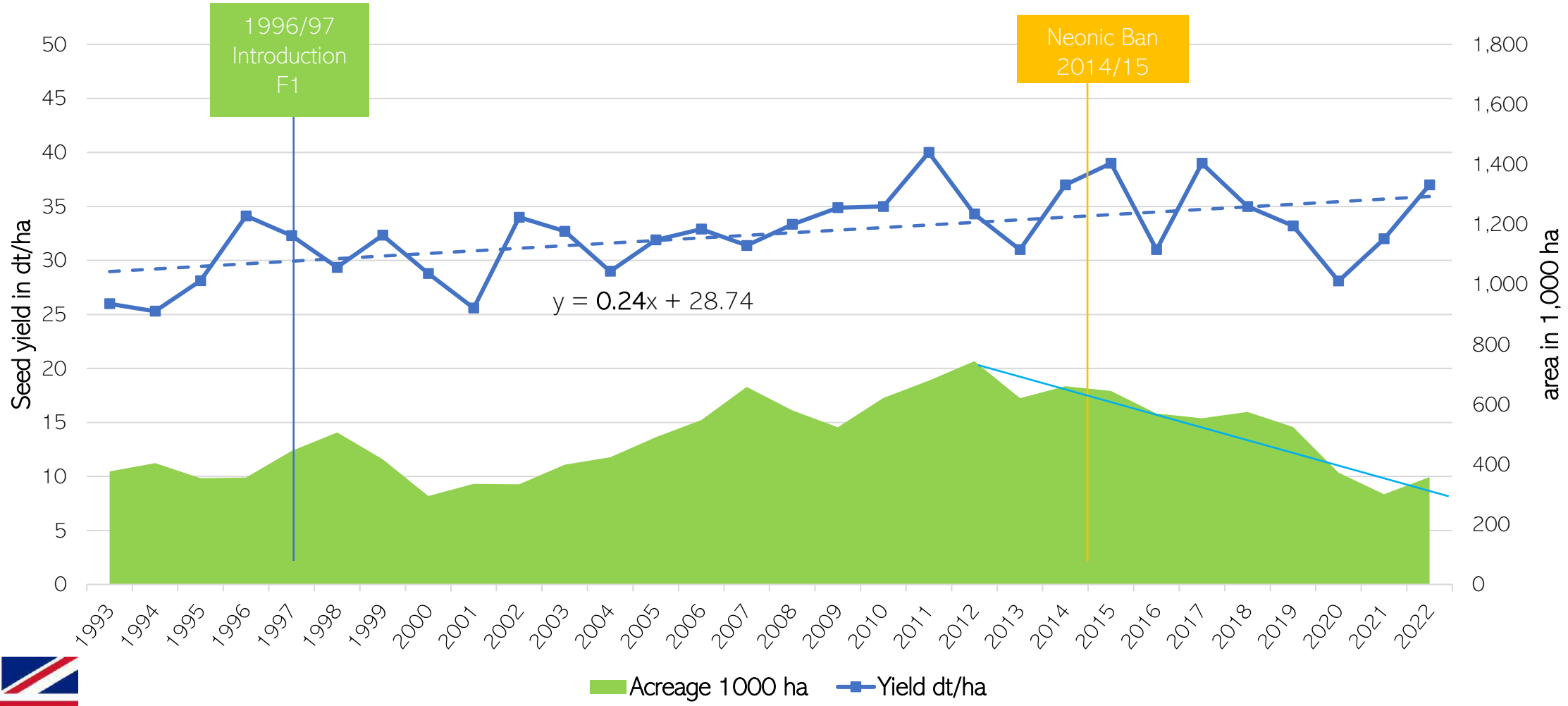
30 YEARS WOSR IN UK: 1993-2022



https://www.gov.uk/government/statistical-data-sets/agriculture-in-the-united-kingdom

June DEFRA Census _England Crop Areas

RAPESEED UNDER PRESSURE (UK VS. GERMANY, 2012 – 2023)

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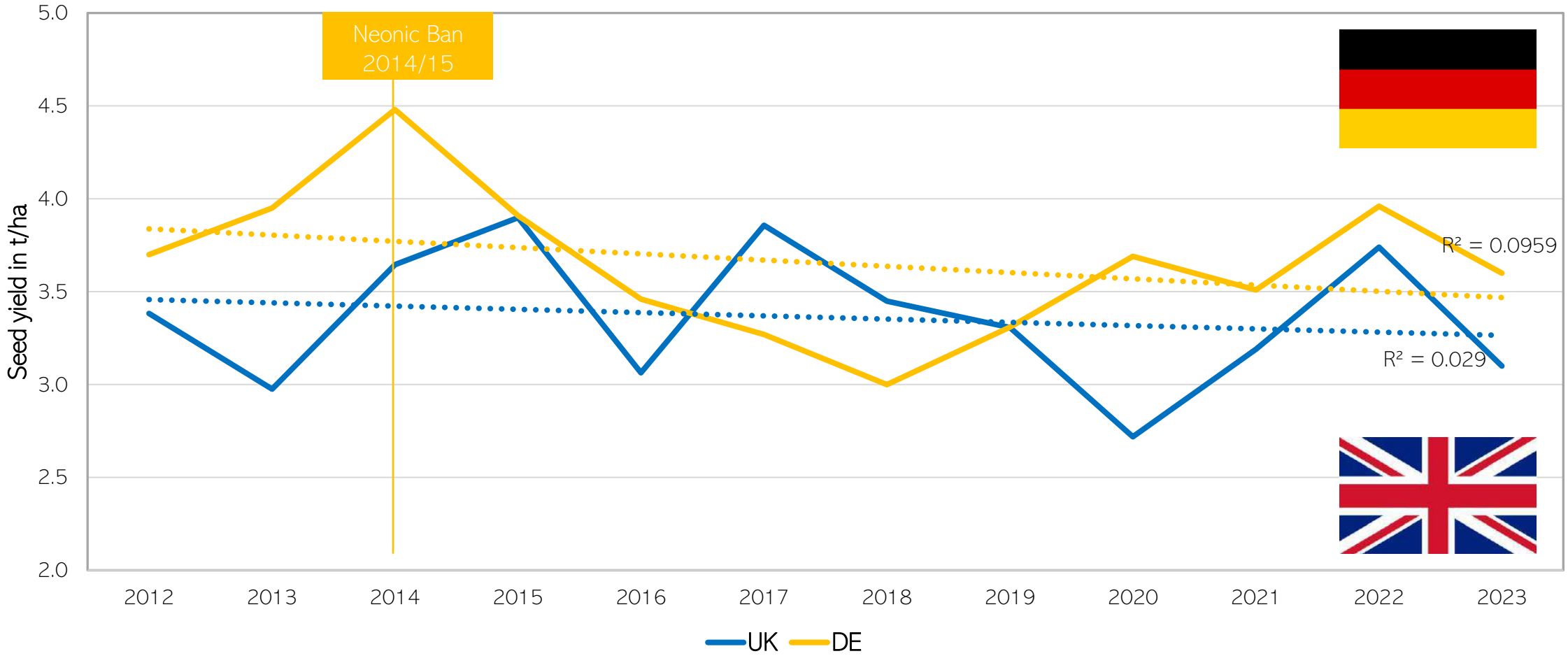
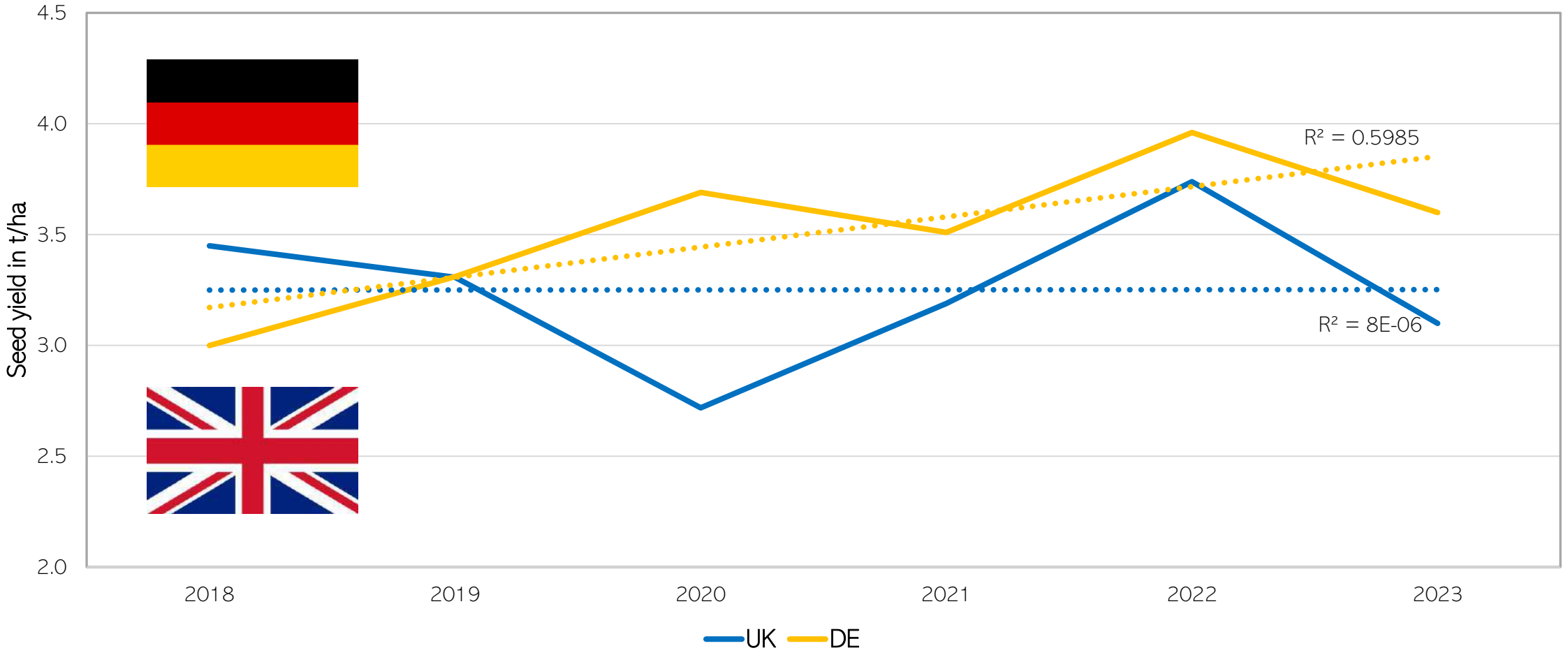


https://www.gov.uk/government/statistical-data-sets/agriculture-in-the-united-kingdom

June DEFRA Census _England Crop Areas, Destatis, Eurostat

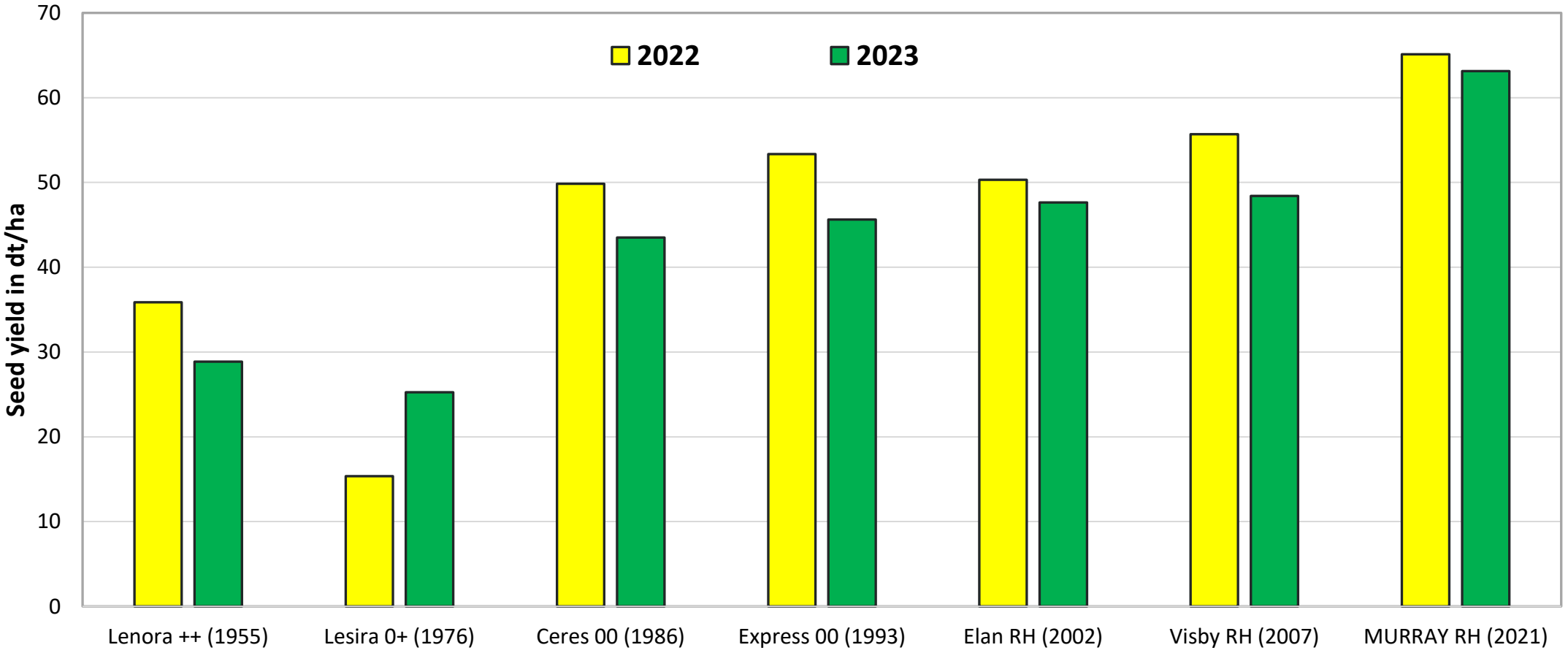
SAME POTENTIAL, BUT DIFFERENT TRENDS…



https://www.gov.uk/government/statistical-data-sets/agriculture-in-the-united-kingdom

June DEFRA Census _England Crop Areas, Destatis, Eurostat

CHALLENGING TREND, DESPITE VISIBLE BREEDING PROGRESS



Source: NPZ, demo trials 2022 & 2023, Location = Hohenlieth, n = 1 plot per variety,
Number in brackets = year of registration

CURRENT STATUS QUO & OPEN ?

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- Clear decrease in the national rapeseed acreage since 2012
  - UK: from rapeseed exporter to net importer (food security?)
- Difficulties to transfer the genetical yield potential from official trials onto farm level
- Genetic gain is still ca. 2% per year, but environmental conditions (climate stress, new pests and pesticide limitations) neutralize it
- Do we need new crop management strategies? Later sowing?
- Is early sowing a reason for limited yields?

Development of oilseed rape in a maritime climate in Schleswig-Holstein

Online-Meeting LSPB

13.12.2023

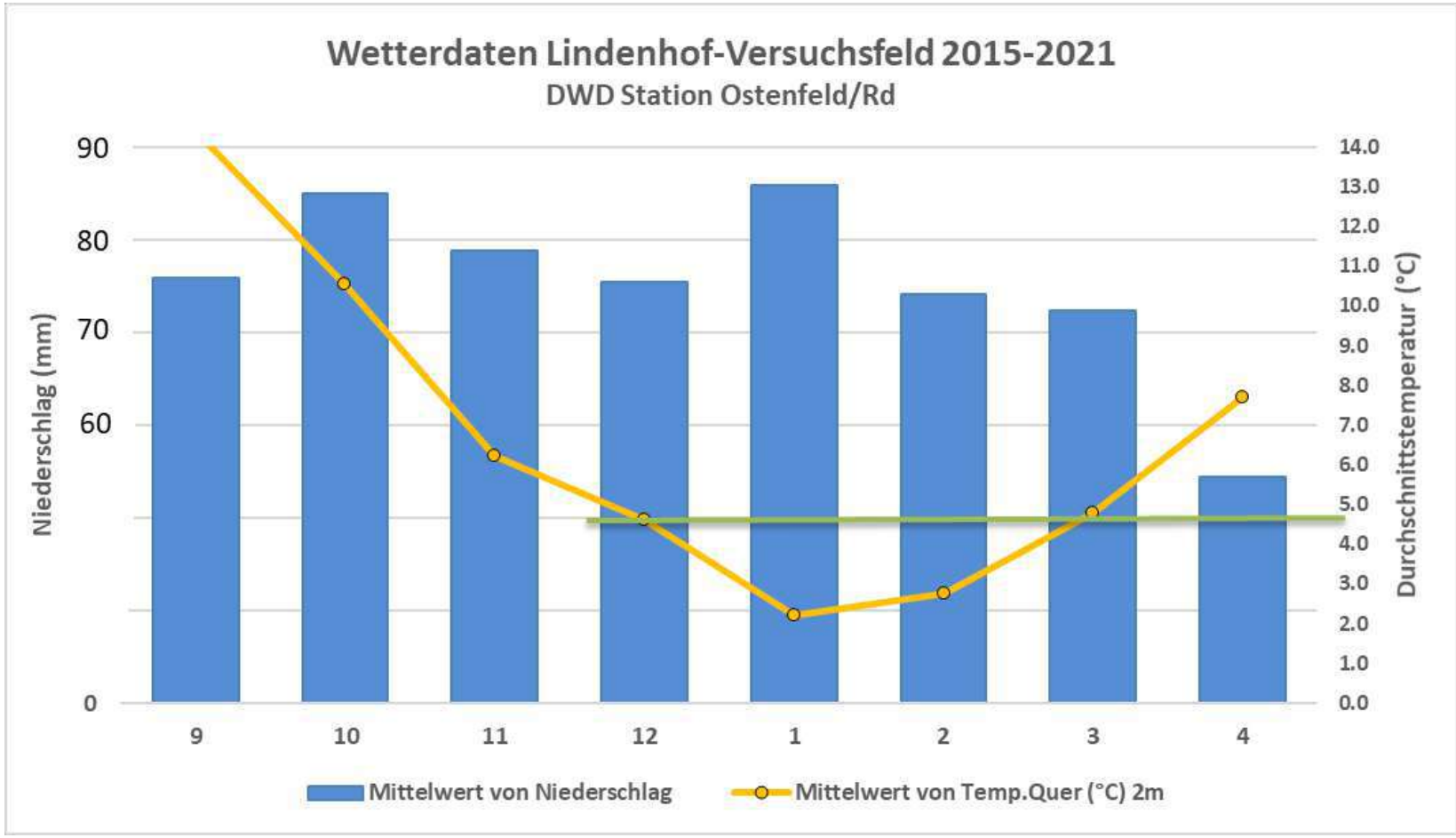
Dr. Ute Kropf

Fachhochschule Kiel
Hochschule für Angewandte Wissenschaften

Quelle: Google Maps

Northern Latitude

Lindenhof trial station



Schleswig-Holstein
Östliches Hügelland

Soil
Para-brown earth
Loamy sand to sandy Loam,
< 12 % clay
40-50 Bodenpunkte
3-4 % organic matter

Climate
Maritime
855 mm rainfall (5 years)
9,9 °C (5 years)

GPS **54.319770**, 9.804266

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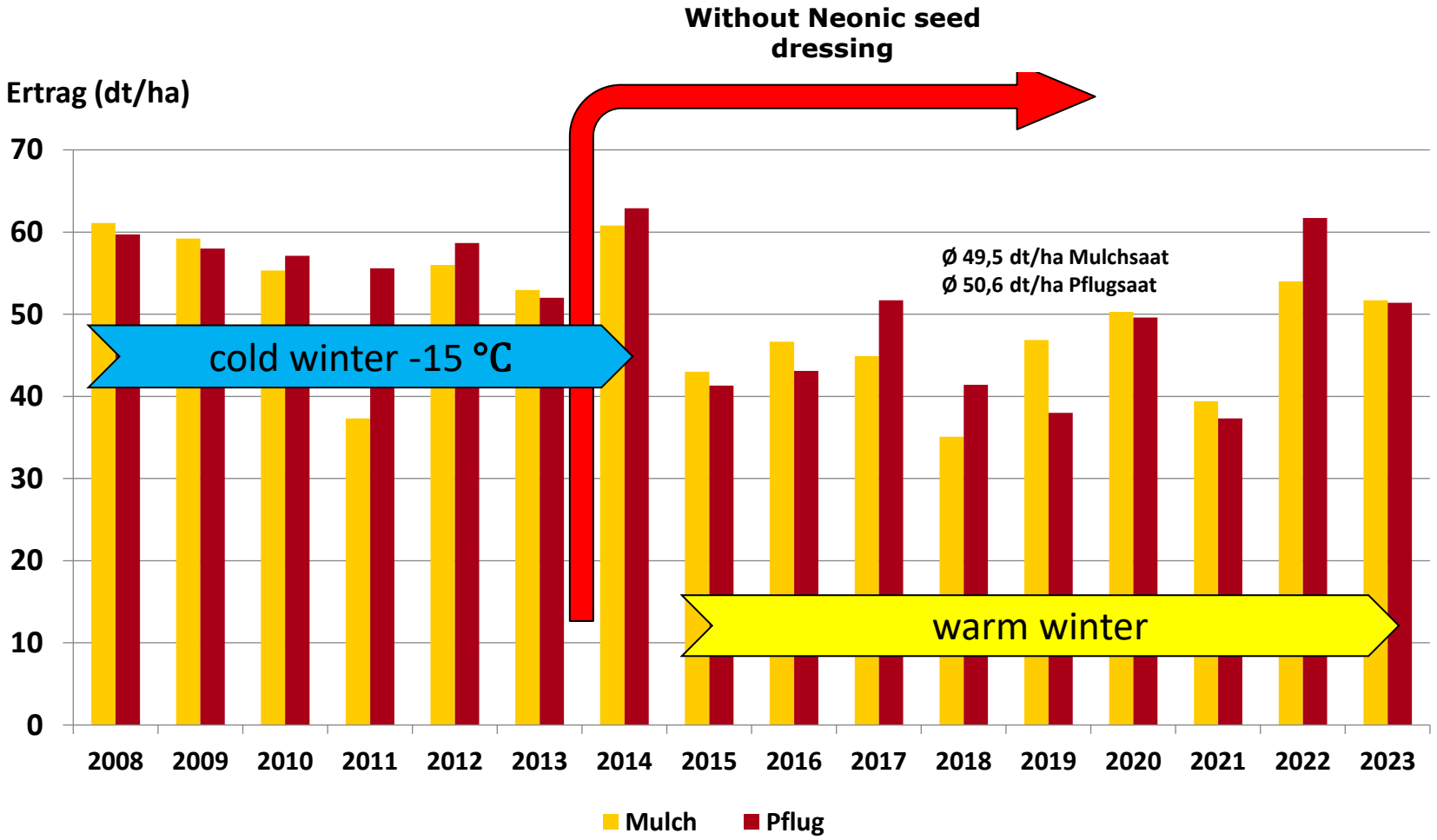
OSR: Yield in a 5 year rotation osr-w-fb-w-ba

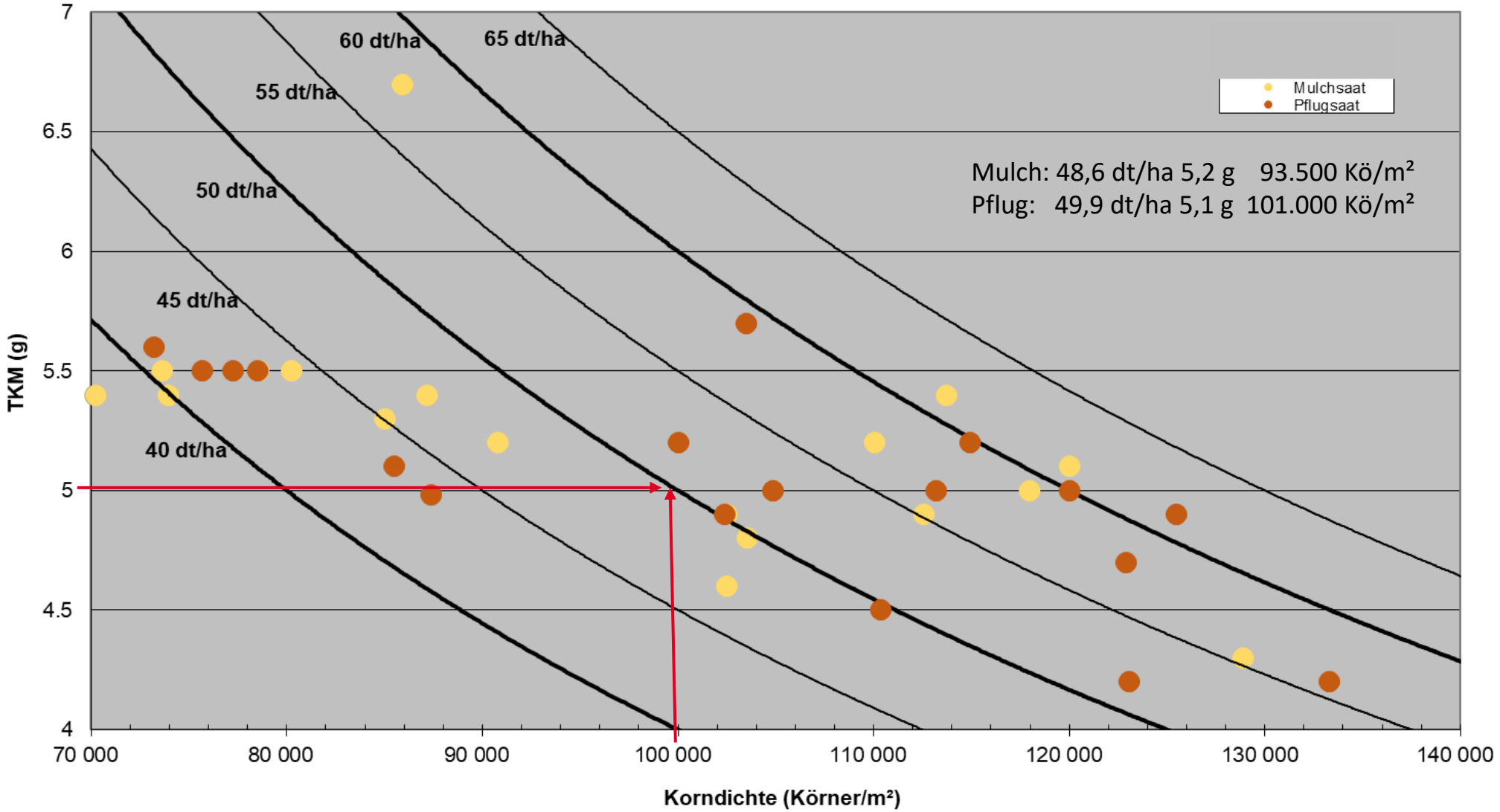


Normal sowing date 26.-30.8.

(Late sowing date) 5.-10.9.

Plant vitality, root and stem health, source/sink capacity

Yield components of oilseed rape 2006-2021
Lindenhof trial station



Number of side shoots and flower buds under short day conditions

© Ute Kropf

6-leaf…

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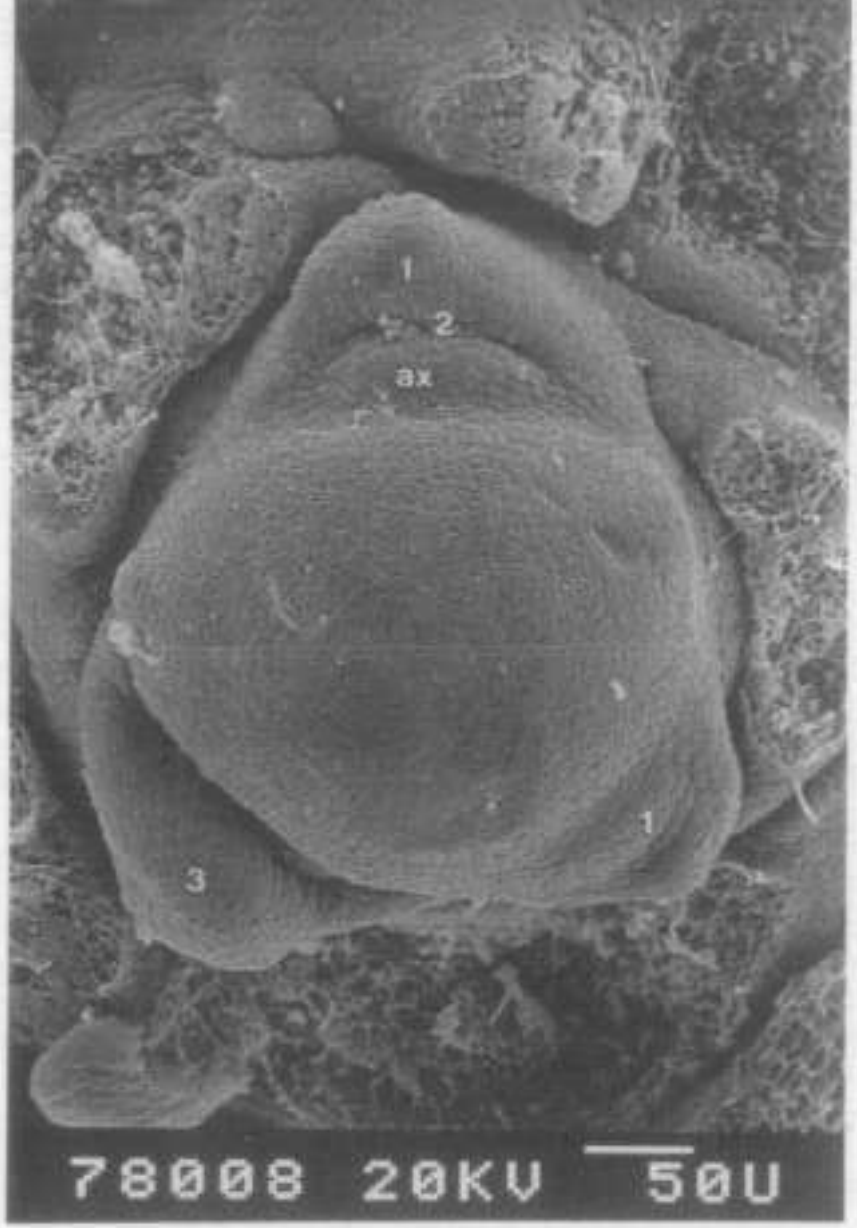

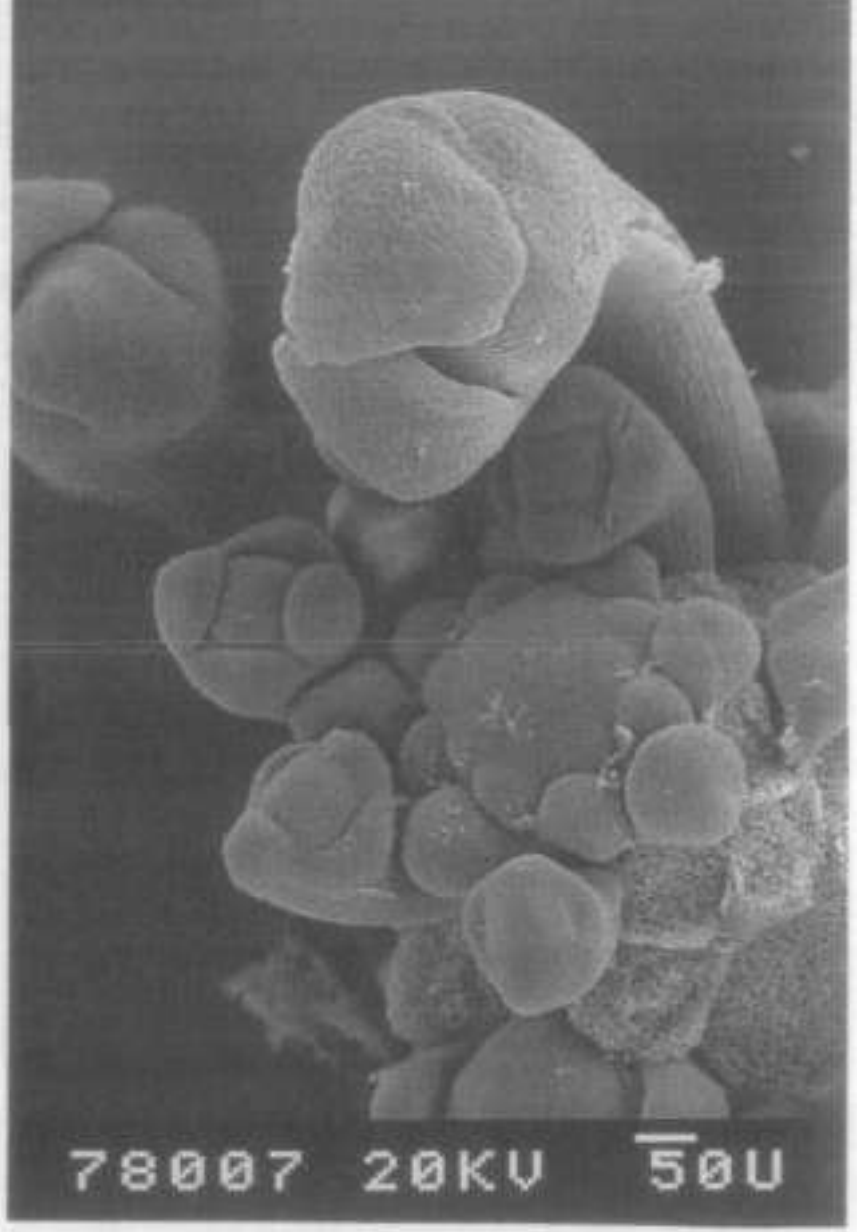

Smith & Scarisbrick (1990)

Leaf stage → flower bud stage

...12 leaves...BBCH 30

1100-1200 ℃

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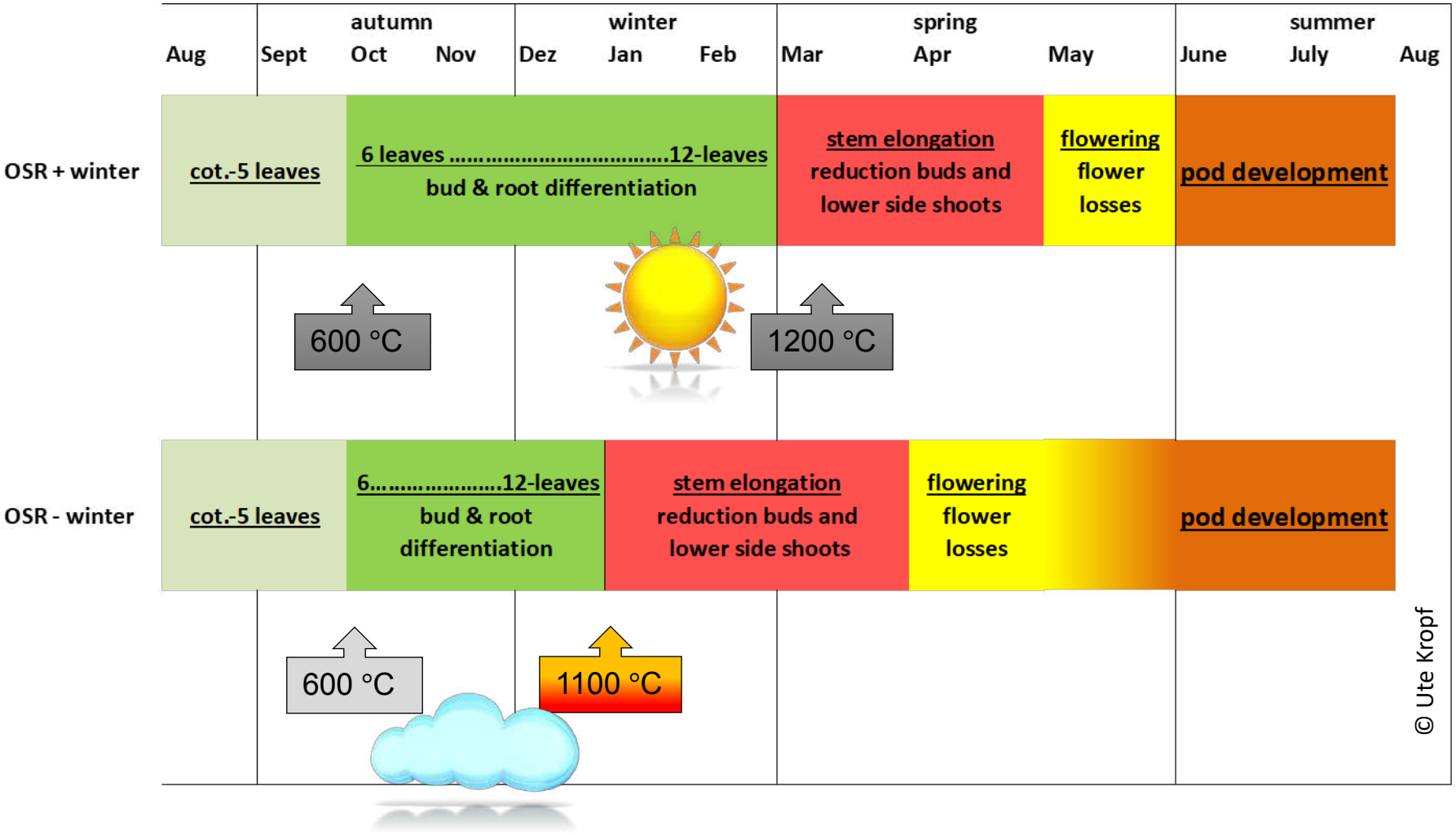
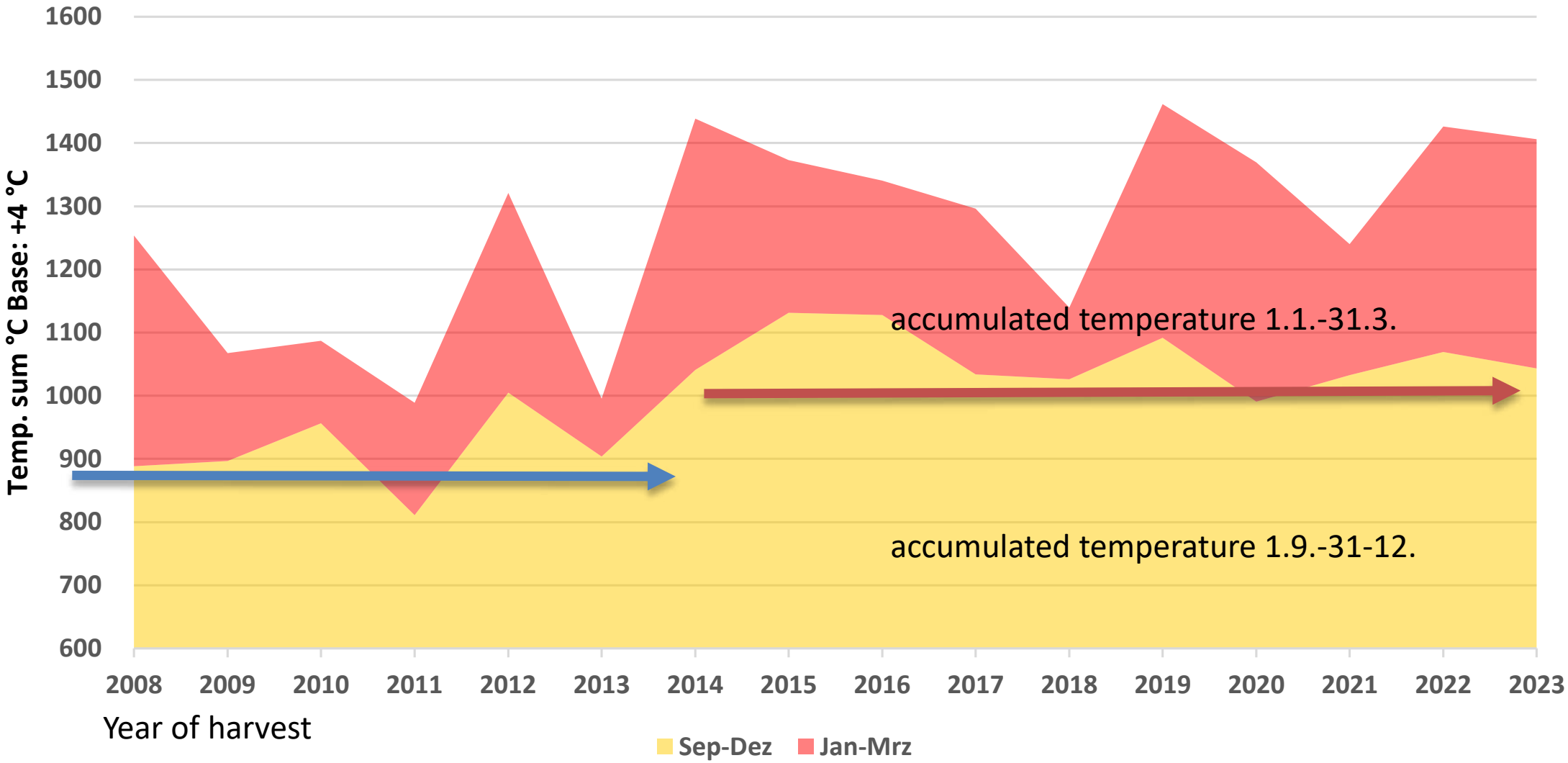
Vegetativ and generative development



Temperature & development Lindenhof

▪ Emergence -> cotyledon	150 °C
▪ Each pair of leaves	120-150 °C depending on daylength, light-intensity, variety
▪ End bud diff. = beg stem elong.	1000-1200 °C "
▪ Min. development autumn	8-10 leaves
▪ Normal sowing date:	last week in August → 1000 °C
▪ Late sowing date:	ca. 10. September → 800 °C + less light → 8-leaf

Less in TuYV var. ????



Accumulated temperature: Lindenof vs Cambridge

Temp. sum, base 4 °C						
Year of harvest	Lindenhof Sep-Dez	Lindenhof Jan-Mrz	Cambridge Sep-Dec	Cambridge Jan-Mar	1000 Grad Cambridge	1000 Grad Lindenhof
2008	**888**	**366**				
2009	**897**	**170**				
2010	**957**	**130**				
2011	**811**	**178**				
2012	**1005**	**316**				
2013	**904**	**92**				
2014	**1041**	**398**				
2015	**1131**	**242**				
2016	**1128**	**212**				
2017	**1034**	**263**				
2018	**1026**	**114**				
2019	**1092**	**370**				
2020	**991**	**379**				
2021	**1033**	**207**		448		
2022	**1069**	**357**	1326	560	19. Sep	06. Sep
2023	**1043**	**363**	1293	533	18. Sep	04. Sep
2024	**1015**		1200			
Avg	**1056**	**360**	**1310**	**547**		
			plus 230	**plus 205**		

Market leading Hybrid (Wisbech): normal Sept-05: 8-leaf 1030 Cd

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Market leading Hybrid (Wisbech): : late Sep-21: 4-6 leaf, 740 Cd

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Summary

- **Plant growth follows thermal time**
- **No dormancy over winter**
- **Bud differentiation ends several weeks earlier**
- **Earlier stem elongation and reduction of buds under poorer conditions**
- **How do we need to adapt production technology to the changed growth conditions?**
- **What genetic characteristics must future varieties have?**

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SUMMARY

LATE SOWING - A VIABLE ALTERNATIVE? NOT JUST A MARKETING STORY

Chris Guest

LSPB
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SUMMARY

- Launch of new Verticillium ratings on the new AHDB RL 2024/25
- Despite visible yield progress we observe stagnant yield in practice, due to climate stress.
- Earlier sowing is potentially driving crop yields down although a mitigation tool for CSFB
- TuYV resistance varieties need less thermal development time (large % of market)- in consequence we observe many “overgrown” canopies.
- Therefore, delayed sowing into September could be part of a key crop management strategy moving forward – utilising on farm historic data e.g. Sencrop
- This is the start of a journey – LSPB has a number of trials to deliver further figures for wider discussion in summer 2024.