

How agronomists use the UKCPVS

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Tuesday 16th January 2024



Agenda

- Background
- Decision making on farm
- Managing disease
- Yellow rust
- UKCPVS
- Agrii R & D and data collection
- Final thoughts

Background

- Worked as an agronomist for last 13 years
- Cover the central south of England, predominantly Dorset, Wiltshire and Hampshire
- Working mainly with arable and forage crops
- Involved locally with replicated field and on farm tramline trials
- Provide technical support nationally on regenerative farming

What drives on farm decisions?

- Profitability
 - Gross margin -> lowest cost per tonne
- Farming system
 - Establishment system
- Agronomics
 - Grassweeds
 - Rotation
 - First wheat - not necessarily true when root crops/veg in rotation



What drives on farm decisions?

- Variety choice drivers
 - Rotational position – drilling date
 - Market
 - Soil type
 - Farming/establishment system
 - Yield and quality
 - Standing power
 - **Disease resistance**
 1. Septoria tritici
 2. Yellow rust
 3. Brown rust/eyespot/fusarium



What drives on farm decisions?

- Yellow rust an increasing threat outside of East Anglia?
 - Climate change?
 - Delayed drilling because of grass weeds
 - Increase in maize acreage for AD
 - Failed Oilseed rape/removal from rotation
 - Increase in 2nd wheat – Zyatt? Skyfall?
 - Increase in growers choosing not to use an insecticide
 - SFI payment
 - Move to conservation agriculture or regenerative system



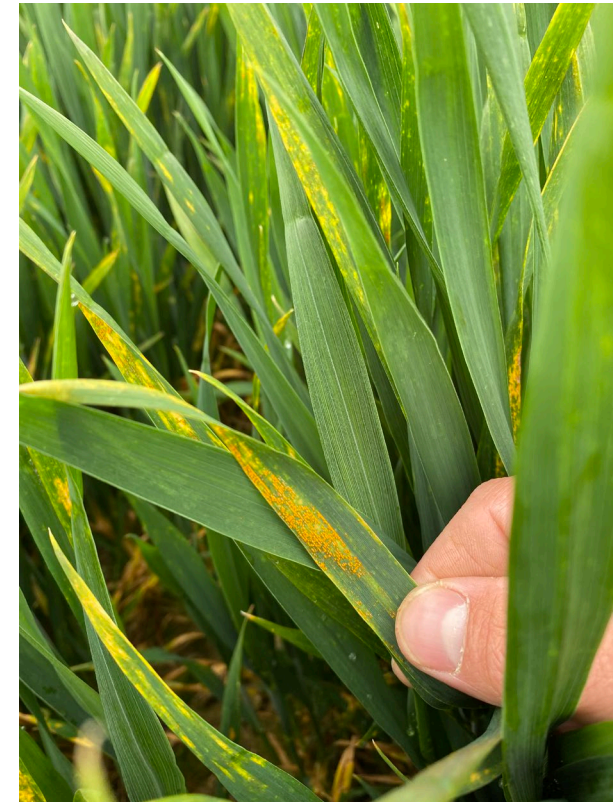
Managing disease

- The challenge of balancing multiple agronomic concerns
 - Grass weeds – later drilling
 - Reducing risk of Septoria through later drilling but increasing risk of yellow rust
 - Workload – impossible to drill all the wheat in the optimal 10 days
 - Yield – drilling earlier into better conditions often results in better yields
 - Conditions – autumn 2022 vs autumn 2023



Managing disease – yellow rust

- Stacking of cultural control
 - Rotation – trying to drill earlier into better conditions
 - Removing volunteers
 - Selecting resistant variety(ies) – growing a mix of varieties with different resistance and parentage
 - Consideration of blends – mixed data
 - Crop nutrition – nitrogen amount and timing, crop health
 - Monitoring levels
- Fungicide
 - Active(s) and dose rate
 - Timing
 - +/- T0
 - On time? Weather? Travelability?



Managing disease – yellow rust

Active ingredient /L	Yellow rust	Brown rust
fenpicoxamid 50g	4	4
mefentrifluconazole 97g	4	5
isoflucypram 50g	7	7
fluxapyroxad 62.5g	2	4
benzovindiflupyr 100g	8	7
prothioconazole 160g + tebuconazole 80g	7	7
prothioconazole 275g	3	3
pyraclostrobin 250g	7	7

- Agrii data



Managing disease – yellow rust

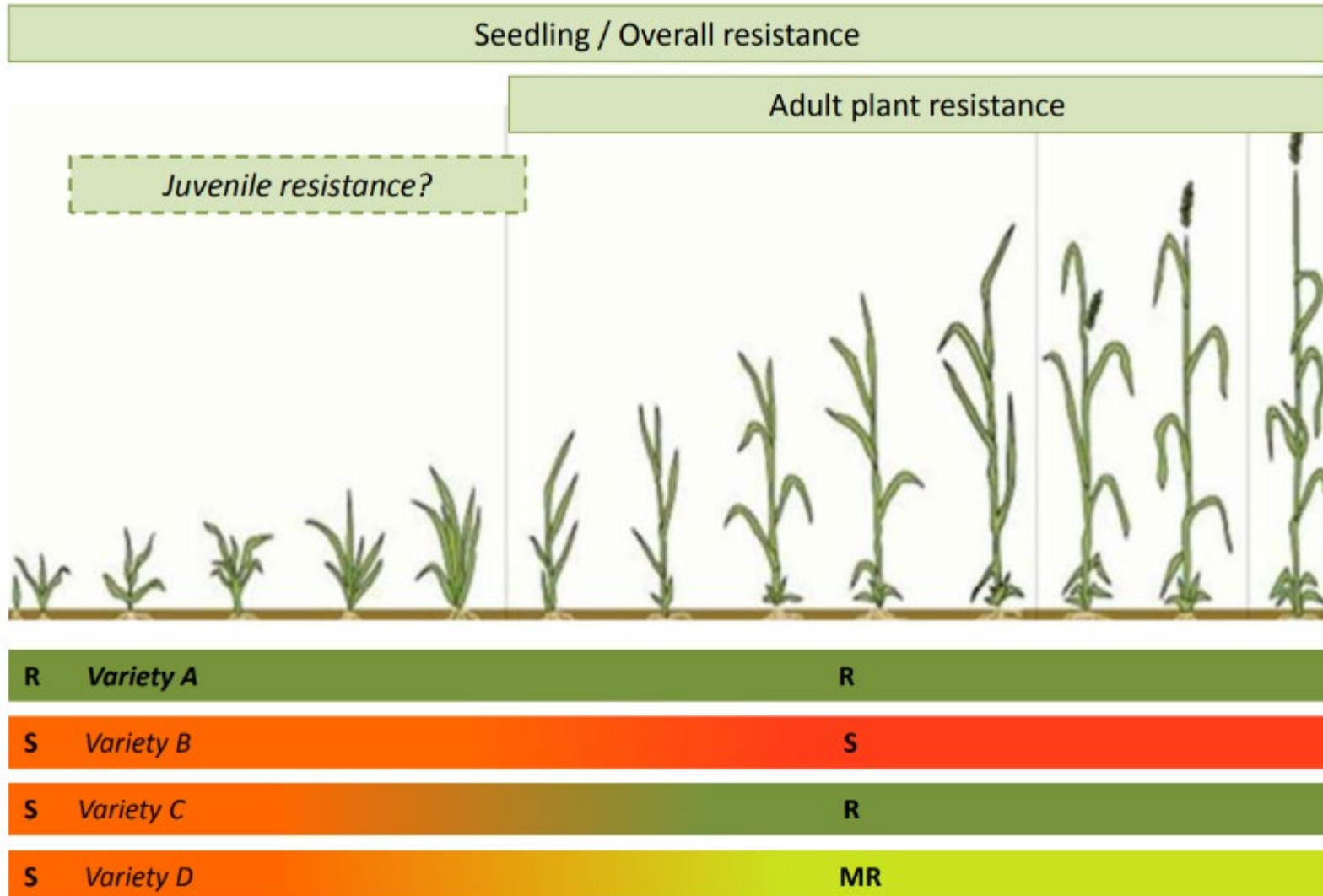
Chemical group	Active ingredient	Yellow rust	Brown rust
Dithiocarbamate	mancozeb***	[1]	[1]
Imidazole	prochloraz (poraz)	[1]	[1]
Phthalimides	folpet***	[1]	[1]
Inorganic	sulphur	-	-
SDHIs	benzovindiflupyr**	4	4
	fluxapyroxad**	3	4
SDHI + other \$	benzovindiflupyr + prothioconazole	5	5
	bixafen + fluopyram + prothioconazole	4	5
	bixafen + prothioconazole	4	5
	fluxapyroxad + metconazole	4	5
	fluxapyroxad + mefentrifluconazole	4	5
	fluxapyroxad + pyraclostrobin	4	5
Qil	fenpicoxamid	[2]	[3]
Qil + other \$	fenpicoxamid + prothioconazole	4	4
Strobilurin (QoI)	azoxystrobin	3	4
	pyraclostrobin	4	5
	trifloxystrobin	[2]	[2]
Strobilurin mixtures \$	fluoxastrobin + prothioconazole	4	5
Triazole***	flutriafol*	[2]	[2]
	metconazole	[4]	4
	prothioconazole	4	2
	mefentrifluconazole	[3]	4
	tebuconazole	[4]	4
	bromuconazole + tebuconazole	-	L

- No resistance issues but control coming from 3 main actives
- Yellow rust not a strength of most of the new chemistry
- Tebuconazole?

- Sending samples in season for testing
- Reporting on the data – 3 new isolates identified last spring
- Assist in making informed decisions
 - In season
 - High risk varieties – watch list
 - Fungicide – active(s)/rate/timing T0?
 - Planning for following harvest
 - Variety choices and split
 - Rotation – drilling date



Growth-stage related resistance



- Understanding and monitoring the variation between varietal resistance at different growth stages



INTERNAL DOCUMENT

Date 14th August 2023 | Number 19



Technical Note

Rust Monitoring Tussocks 2023 – Final Report

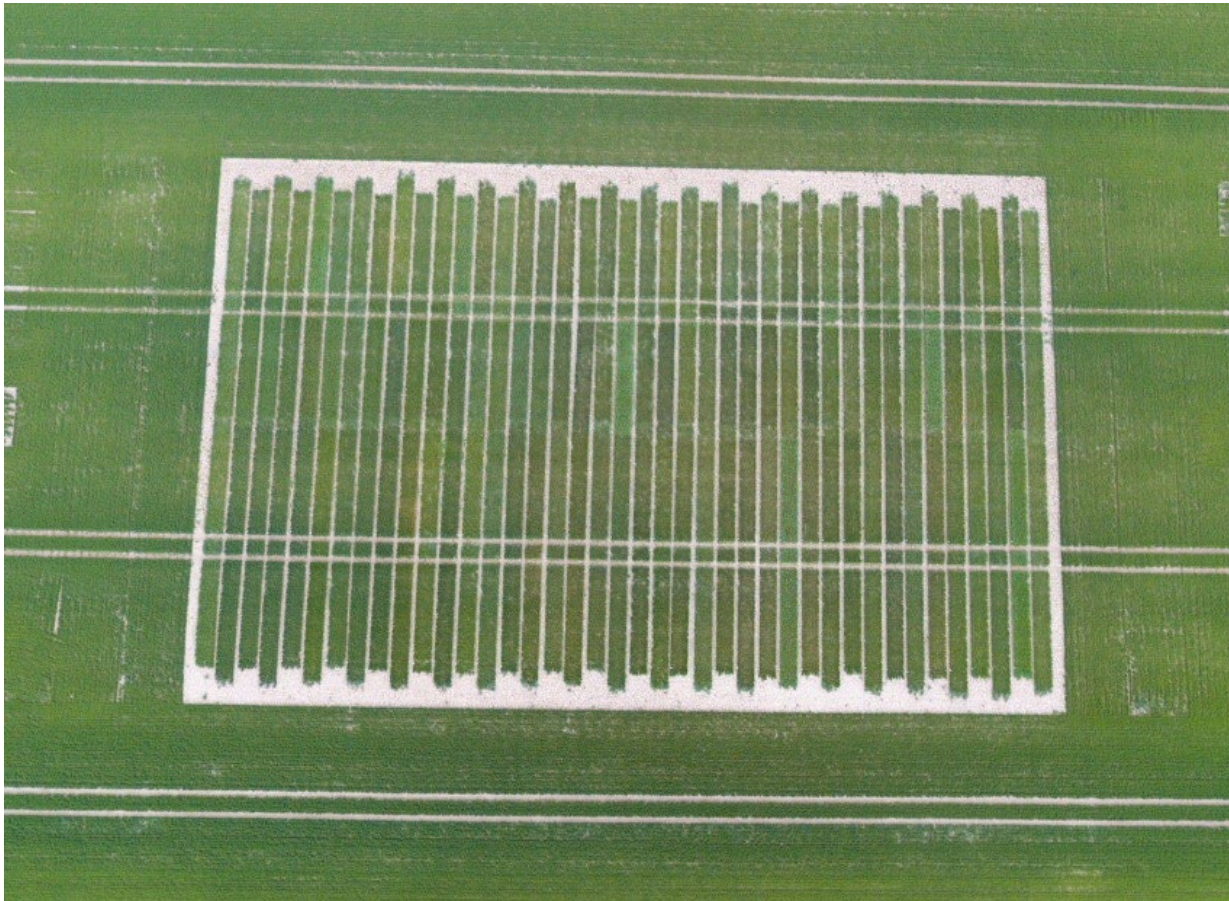


Tussock sites 2023

1. Carnoustie, Angus, Scotland
2. Chirnside, Hexham, Northumberland
3. Bishop Burton, Hull, Yorks
4. Boston, Lincs
5. Drinkstone, Suffolk
6. Throws Farm, Great Dunmow, Essex
7. Lenham, Ashford, Kent
8. AgriFocus, Swindon, Wiltshire
9. SW iFarm, Saltash, Cornwall
10. Bridgend, South Wales
11. Ludlow, Shropshire
12. Glenrothes, Fife, Scotland

- Regular monitoring of a large set of genetics from across England, Wales and Scotland
- Particular focus on commonly used parents in current breeding





- Data collection in season from treated and untreated replicated varieties
- Varieties selected based upon area in the ground nationally and locally

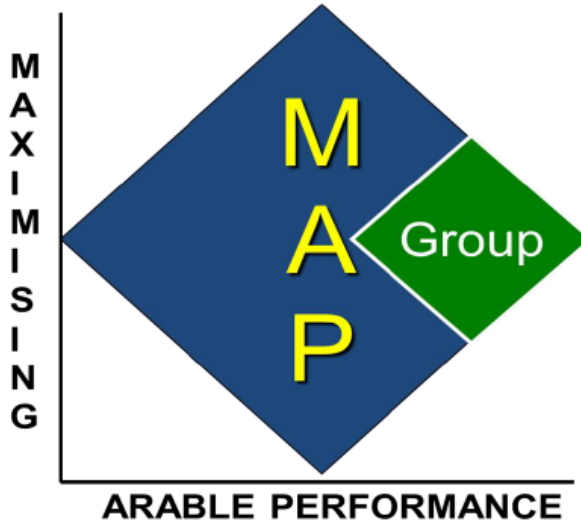
Agrii MAP group



Achieving your full arable potential

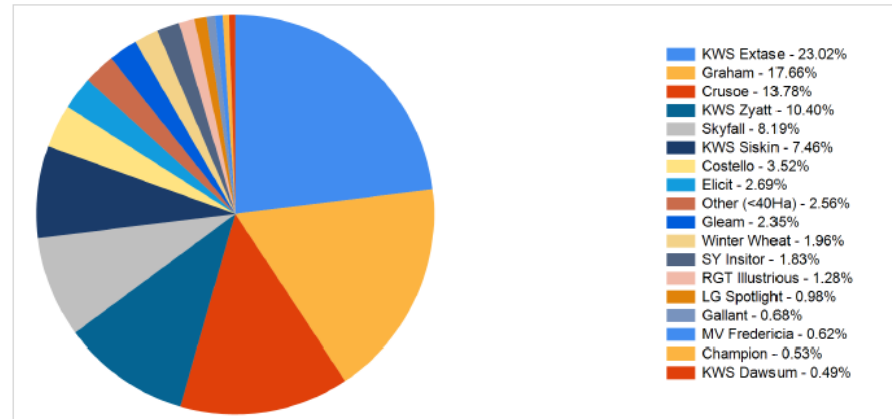
MAP Group Additional Reports Harvest 2015

Strictly Confidential for Participating Farmers



Agrii would like to thank all participating farmers and agronomists for their support of the MAP group

All Winter Wheat Varieties

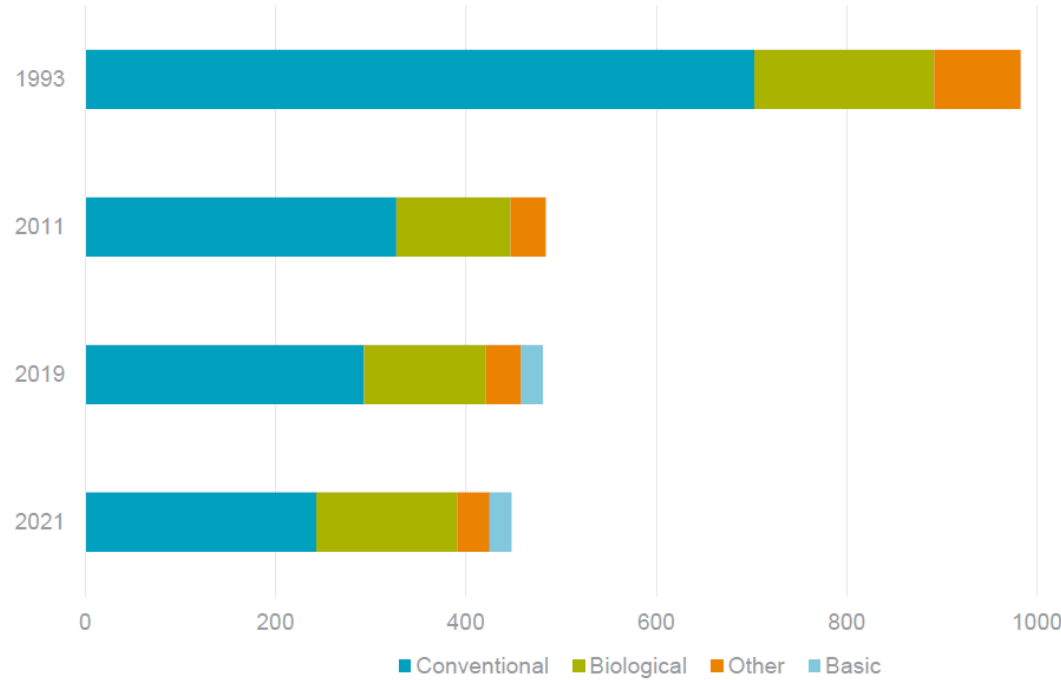


Variety	Area Ha	Yield / Ha	Price £ / T	Seed	Fertiliser	Fungicides	PGR	Total Variable Costs	Gross Margin
KWS Zyatt	949	10.86	289	73.4	381.2	152.5	15.9	806.4	2332.5
Crusoe	1258	10.21	289	65.0	277.7	139.1	11.9	642.9	2303.7
RGT Illustrious	117	10.76	295	78.6	480.9	154.9	18.8	908.8	2261.4
SY Insector	167	10.85	263	73.0	207.5	170.6	14.1	602.6	2253.4
KWS Extase	2101	10.50	253	76.5	252.4	110.2	11.9	591.3	2067.9
Graham	1612	10.59	250	70.0	256.7	124.5	12.9	597.5	2055.1
Elicit	245	9.85	265	70.0	184.5	122.7	11.8	568.4	2041.8
Gleam	214	10.62	245	73.5	216.7	139.2	13.8	604.4	1998.2
Costello	321	10.17	248	76.1	203.9	108.4	11.2	546.6	1974.6
KWS Siskin	681	9.85	249	61.1	238.6	102.5	13.1	571.1	1884.1
Skyfall	748	8.21	287	86.1	229.2	109.8	8.5	582.1	1775.1
Winter Wheat	179	9.45	245	91.6	253.6	127.6	12.9	708.7	1606.0



Final thoughts

AI Approvals in the EU



- Loss of epoxiconazole
- Tebuconazole – the end is near?
- Further revocations?
- New chemistry?
- Rust control likely to get more expensive
 - Vital to have up to date accurate data

Final thoughts



- Increase in regenerative farming and direct drilling
 - Increased effort to reduce fungicides – especially early on when the soil is not covered
 - Big move into faster tillering varieties – Skyfall (2nd most susceptible RL variety) and Extase (most sampled variety in UKCPVS last spring)
 - Earlier drilling?
 - BYDV?
 - Grassweeds?

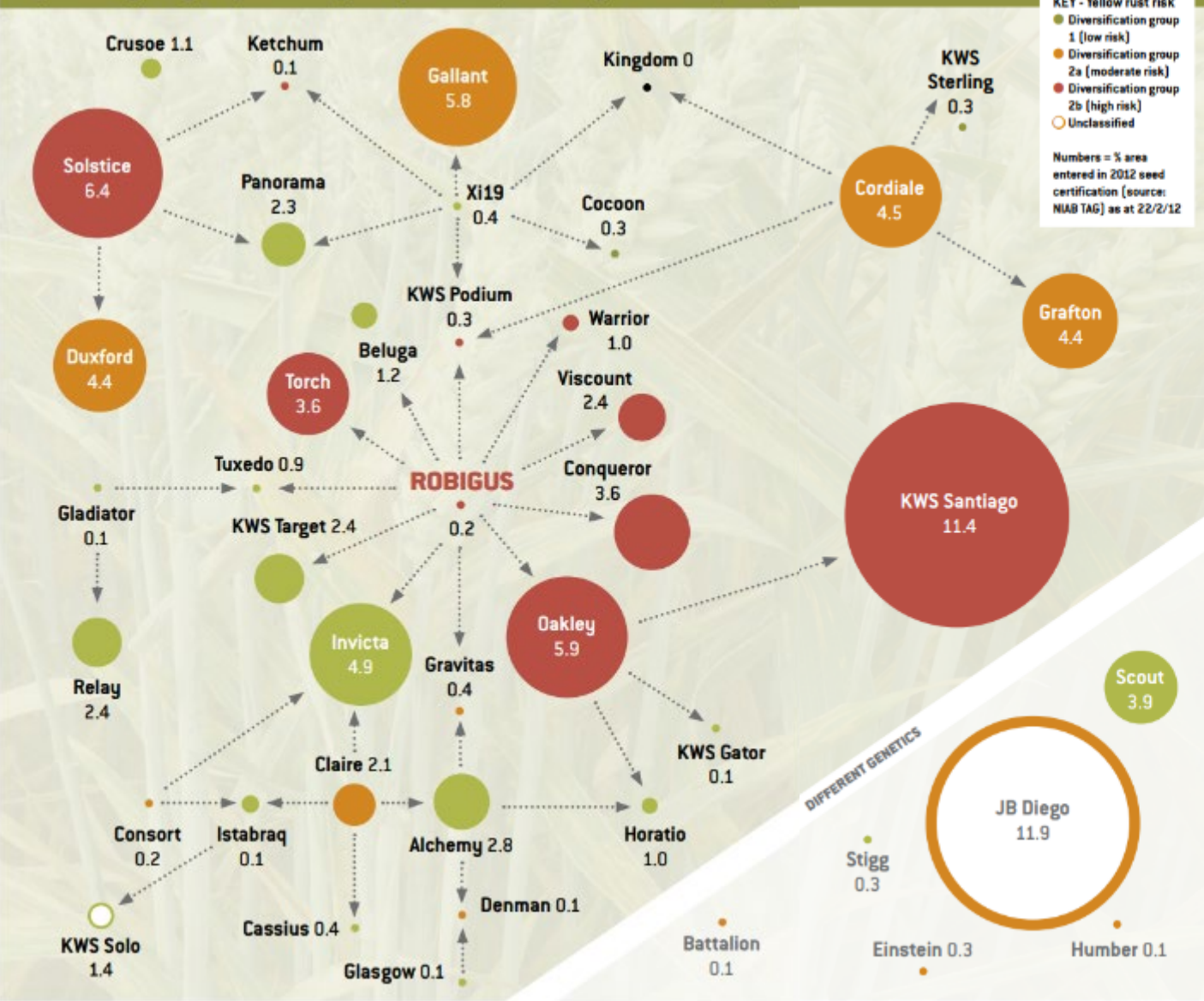
Final thoughts

- Desire to reduce reliance of fungicides
 - Can nutrition play a bigger role?
 - Biologicals?
- Increase in later drilling?
- Increased focus on breeding
 - Varietal breakdown – enough genetic variation?
 - Hybrid wheat? GE? GM?



Final thoughts

Graphic showing variety area [size of circle], wheat parent lines [arrows] and yellow rust risk [colour]



Is there enough genetic diversity in wheat?

- Dominant wheat parent lines
- Produce positive characteristics
- Leave vulnerabilities
- Address through better genomic knowledge

By Mike Abram

Around 60% of this season's winter wheat has come from just four genetic parent lines, only one of which is low risk for yellow rust after the emergence of new strains in the past two seasons.

It emphasises the potential vulnerability from using just a few key parent lines as sources of the next generation of wheat varieties. But it doesn't tell the whole story, stresses Ed Flatman, senior wheat breeder for RAGT.

Dominant parent lines typically emerge on the back of that variety making a step-change in some characteristic, usually yield, but occasionally for something more specific, such as the orange wheat blossom midge resistance found relatively recently, he explains.

"If there is a major new variety breakthrough, all breeders will use that in its programmes."

Using those varieties brings a good chance of success, particularly when crossing within a Nabis group, but it can lead to an increased vulnerability. That is most obvious with disease resistance, particularly rusts, where a breakdown in the resistance within a

variety can potentially expose related varieties.

But just because a parent is susceptible doesn't necessarily mean a progeny variety will be at risk. As the graphic illustrates, some varieties can still have good yellow rust resistance even if one parent has become susceptible.

That's because other sources of resistance have been bred into the variety, which means if one source is broken, another still gives good resistance.

The increased understanding of the wheat genome is helping to breed in extra resilience, Mr Flatman points out. The use of genetic markers helps breeders incorporate genes that can introduce more resistance to a disease, for example, or help overcome other weaknesses of a parent variety.

Those genes can come from outside the current variety pool, he says. "We're looking at historic varieties or those from other geographical areas to use within our crosses."

Bringing in new sources of genetics also helps drive yield forward, he says. "The trick is incorporating the useful genes and leaving behind the deleterious ones." mike.abram@rbi.co.uk

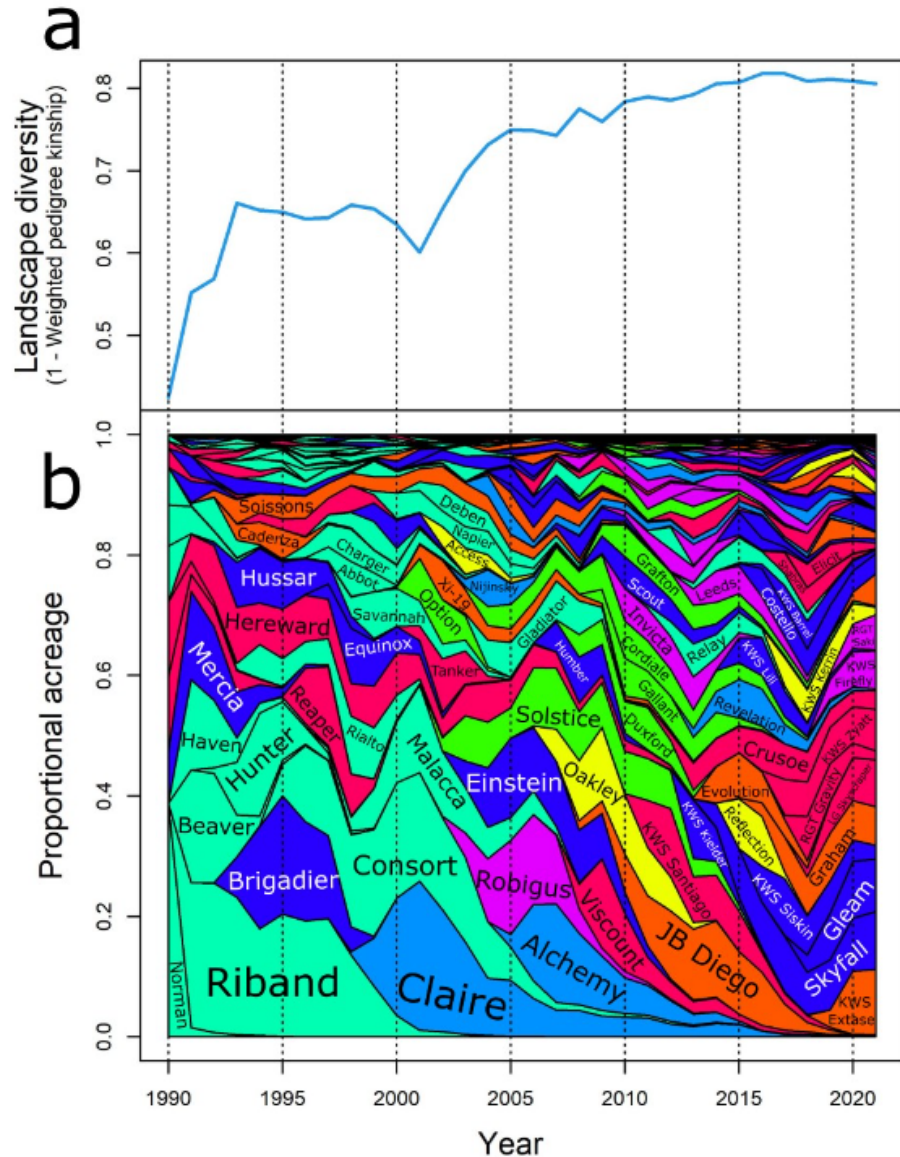
BREEDING CHARACTERISTICS

	Robigus	Selctice	Xi19	Oakley
% Market share (2013)	26.8	13.2	9.9	18.4
Positive	High yield DWB Septoria resistance Tillering Quality	Quality Soft straw Yield consistency	Quality Yellow rust resistance High yield	High yield DWB Tillering
Negative	Yellow rust Second wheat performance Sprouting	Yellow rust Disease resistance	Weak straw Low protein	Yellow rust Eyespot

Source - Crops 2012

Robigus yellow rust weakness coming through in many breeding lines

Final thoughts



a - Trends in landscape diversity of wheat grown in England since 1990

b - Proportional area of wheat varieties based on data from NIAB SeedStats service

Final thoughts

Autumn 2023 C2 seed purchases

	Variety Name	MS %	Agrii % sales	Group
1	KWS Dawsum	20	14	4H
2	KWS Extase	13	17	2
3	Champion	9	5	4H
4	Crusoe	6	8	1
5	LG Skyscraper	6	4	4S
6	Skyfall	6	10	1
7	Graham	5	8	4H
8	LG Typhoon	5	5	4H
9	Gleam	4	3	4H
10	KWS Palladium	4	5	2

- + Group 1 = 15.1%
- + Group 2 = 18.7%
- + Group 3 = 1.5%
- + Group 4S = 11.1%
- + Group 4H = 52.1%

- + Yellow rust concerns @ T0 = 35%
- + Brown rust below at 4.6 = 41%



Final thoughts

Variety	Parent	Parent
KWS Dawsum	KWS Kerrin	Costello
KWS Extase	Boisseau	Solheio
Champion	DSV20122	Reflection
Crusoe	Cordiale	Gulliver
LG Skyscraper	Cassius x NAWW29	KWS Santiago
Skyfall	C4148	Hurricane
Graham	Expert	Premio
LG Typhoon	Garrus	LGW88
Gleam	KWS Kielder	Hereford
KWS Zyatt	Quartz	Hereford
KWS Palladium	KWS Zyatt	KWS Trinity
Firefly	Cougar	Rowan
Elicit	Cassius	Viscount
	Robigus parentage	
	Parent very susceptible to one of the key diseases	
	Parent less used and a lower risk	

- Breakdown of Robigus line to yellow rust and Septoria well documented
- Hereford and Timaru lines also under scrutiny

Final thoughts

- More accurate and up to date information = better decision making on farm
- Can the UKCPVS provide detailed in season updates?
- Opportunity for improved cross industry partnership to increase the level of data



A decorative graphic consisting of multiple thin, wavy lines in shades of blue and green, flowing across the top of the slide.

Thank you for listening, any Questions?