



United Oilseeds & AHDB Joint Seminar 2020

Welcome and introduction

Chaired by Andrew Cragg, United Oilseeds

AHDB Recommended List 2020/2021

Dr Paul Gosling – RL Manager



What is new and what is on the horizon?

- New varieties on the RL – a brief update
- Pod shatter resistance – is it real and can we measure it?
- Vigour – everyone wants it, but nobody is quite sure what it is.
- Verticillium wilt RL ratings, yes or no?
- CSFB resistant varieties – are they going to happen?

OSR New Variety Highlights

- New varieties with a large yield advantage over established varieties, with three gaining automatic recommendation based on gross output yield
- New varieties with high resistance ratings for stem canker and light leaf spot
- A quarter of varieties now have TuYV resistance
- Five new varieties have been recommended for specific purposes offering growers a wide choice with agronomic and market decisions:
 - Clubroot resistance
 - Herbicide tolerance
 - Semi-dwarfing
 - HEAR
- Good balance of conventional and restored hybrid varieties

Winter oilseed rape

New general purpose UK varieties

	New					
	Acacia	Ambassador	Aurelia	Artemis	Aardvark	Aspire
UK gross output	109	108	108	107	105	106
E/W gross output	110	108	107	107	105	106
N gross output	108	104	108	[106]	106	105
Lodging	[8]	[8]	[8]	[8]	[8]	8
Stem stiffness	9	8	8	8	8	9
Shortness of stem	7	6	6	5	6	7
Earliness of maturity	5	6	5	6	5	5
Stem canker	5	8	8	7	6	6
Light leaf spot	6	7	8	6	7	7
TuYV resistant	N	Y	Y	Y	N	Y

Gross output controls: Treated 5.10 t/ha (UK), 5.03 t/ha (E/W), 5.69 t/ha (N)

[]: Limited data

Winter oilseed rape

New specialist varieties - Clubroot resistant E/W

	New		
	Crocodile (E/W)	Croozer (E/W)	Chrome (UK)
UK gross output	104	102	102
E/W gross output	105	102	102
N gross output	95	97	104
Lodging	[8]	[8]	8
Stem stiffness	8	8	8
Shortness of stem	6	6	6
Earliness of maturity	5	6	5
Stem canker	4	9	4
Light leaf spot	6	6	6
TuYV resistant	N	N	N

Gross output controls: Treated 5.10 t/ha (UK), 5.03 t/ha (E/W), 5.69 t/ha (N)

[]: Limited data

Winter oilseed rape - new for 2020/21

Specialist clubroot varieties separated

AHDB RECOMMENDED	Recommended for the UK (both East/West and North regions)												Recommended for the East/West region only										Recommended for the North region only										Recommended for use in areas with clubroot only \$				Described varieties			
	Acacia	Aurelia	Aspie	Aurivank	Bailed	DK Expansion	Templation V	Auchland V	Nikla	V 316 OL =	P 1279CL &	Amessenger	Alfama	Dazler	Daring	P 1275	Wincosz	George	Edgar	Niza CL &	Blazen	DK Estate	Elevation	Barbados	Anastasia	Keller	Broadway	Butterfly	Come	Cocodale	Crooser	Average LSD (G%)	PX101	Resort 1						
Variety type	Conv	RH	Conv	Conv	Conv	RH	RH	Conv	RH	RH	E/W	E/W	E/W	E/W	E/W	E/W	E/W	Conv	RH	E/W	Conv	RH	Conv	Conv	Conv	Conv	Conv	Conv	RH	RH	RH									
Scope of recommendation	UK	UK	UK	UK	UK	UK	UK (Sp)	UK (Sp)	UK	UK Sp	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK Sp	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK
	NEW	NEW	NEW	NEW	NEW	NEW	*	*C	C	C	NEW	NEW	NEW	NEW	NEW	NEW	*	*C	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW	NEW
Gross output, yield adjusted for oil content (% treated control)																																								
United Kingdom (5.1 t/ha)	109	108	106	105	105	103	103	101	100	98	96	108	107	103	103	102	102	102	100	96	103	101	98	99	96	96	94	93	102	104	102	4.5	97	94						
East/West region (5.0 t/ha)	110	107	106	105	105	103	103	101	99	98	96	108	107	104	103	103	103	102	101	96	102	101	97	98	96	95	93	93	102	105	102	4.8	97	94						
North region (5.7 t/ha)	108	108	105	106	102	104	98	97	102	97	92	[104]	[106]	[101]	[102]	98	99	101	98	[90]	[105]	103	102	102	101	99	98	98	104	[95]	[97]	6.0	98	93						
Seed yield (% treated control)																																								
United Kingdom (4.7 t/ha)	109	108	105	105	104	103	102	101	99	98	96	108	106	102	103	102	104	102	101	97	104	101	98	99	99	96	94	93	101	105	103	4.1	96	93						
East/West region (4.7 t/ha)	109	108	105	105	104	103	102	102	99	99	96	109	106	103	103	103	104	102	101	97	103	101	97	99	98	95	93	93	100	106	103	4.5	95	93						
North region (5.2 t/ha)	107	109	105	105	102	104	97	98	102	97	93	[105]	[106]	[100]	[101]	98	101	100	98	[91]	[107]	103	102	103	102	99	98	98	103	[96]	[97]	5.7	96	93						
Untreated gross output, yield adjusted for oil content (% untreated control) a																																								
United Kingdom (5.3 t/ha)	-	-	105	-	101	100	106	101	101	98	95	-	-	-	-	101	101	98	100	-	-	103	100	98	99	96	95	100	103	-	-	7.1	-	-						
Untreated seed yield (% untreated control) a																																								
United Kingdom (5.0 t/ha)	-	-	105	-	101	101	105	101	101	98	95	-	-	-	-	101	102	98	101	-	-	103	99	99	101	95	95	100	102	-	-	6.5	-	-						
Agronomic features																																								
Resistance to lodging (1-9)	[8]	[8]	8	[8]	8	8	8	8	8	8	8	[8]	[8]	[8]	[8]	8	8	8	8	[8]	[8]	8	8	8	8	8	8	8	8	8	[8]	[8]	0.2	[8]	[8]					
Stem stiffness (1-9)	9	8	9	8	8	8	7	8	8	8	8	8	8	9	8	8	8	8	8	8	9	8	8	8	8	8	9	8	8	8	8	8	0.4	9	8					
Shortness of stem (1-9)	7	6	7	6	7	5	6	6	7	6	6	6	5	6	6	6	7	7	6	6	6	5	7	6	6	7	6	6	7	6	6	6	0.2	9	6					
Earliness of flowering (1-9)	6	7	7	8	7	6	6	6	7	6	6	7	6	6	7	5	8	7	6	7	6	6	5	6	6	6	7	7	6	7	6	6	0.3	6	7					
Earliness of maturity (1-9)	5	5	5	5	4	5	5	6	5	5	6	6	6	6	5	5	5	5	6	5	5	5	5	4	5	5	5	4	5	5	6	0.4	4	5						
Seed quality (at 9% moisture)																																								
Oil content, fungicide-treated (%)	45.7	45.2	45.7	45.7	45.8	45.5	46.0	45.0	45.7	45.3	44.9	45.3	45.7	46.2	46.0	45.5	44.5	45.4	45.1	45.0	44.8	45.5	45.6	45.0	44.6	45.9	45.2	45.4	46.4	45.0	44.8	0.3	46.7	45.8						
Glucosinolate (µmoles/g of seed)	8.1	10.2	9.9	10.0	10.8	10.1	12.0	14.4	8.6	12.3	10.9	10.9	12.3	11.1	12.2	8.4	9.6	9.6	9.6	14.9	10.7	11.9	10.6	11.1	11.1	13.3	8.2	10.2	10.8	12.8	12.2	-	9.4	14.0						
Disease resistance																																								
Light leaf spot (1-9)	6	8	7	7	6	6	6	5	7	6	6	7	6	6	6	6	5	6	7	4	6	7	6	8	7	7	7	7	6	6	6	0.8	7	6						
Stem canker (1-9)	5	8	6	6	5	7	5	5	4	5	5	8	7	8	8	5	5	9	6	6	7	8	5	7	5	3	4	6	4	4	9	0.5	6	6						
TuYV Resistance	-	R	R	-	-	-	R	R	-	-	-	R	R	R	R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Some strains of clubroot are able to overcome the resistance in these varieties and growing them repeatedly will select for these more virulent strains, potentially causing the resistance genes to become ineffective.

How important is clubroot - latest AHDB research

- Estimated £30 million cost in 2009
- Soils from 75 high-risk clubroot fields were used to grow a resistant and a susceptible winter oilseed rape variety
- In about half of these the resistant variety developed symptoms
- At 15% of the sites resistance was no longer functioning effectively

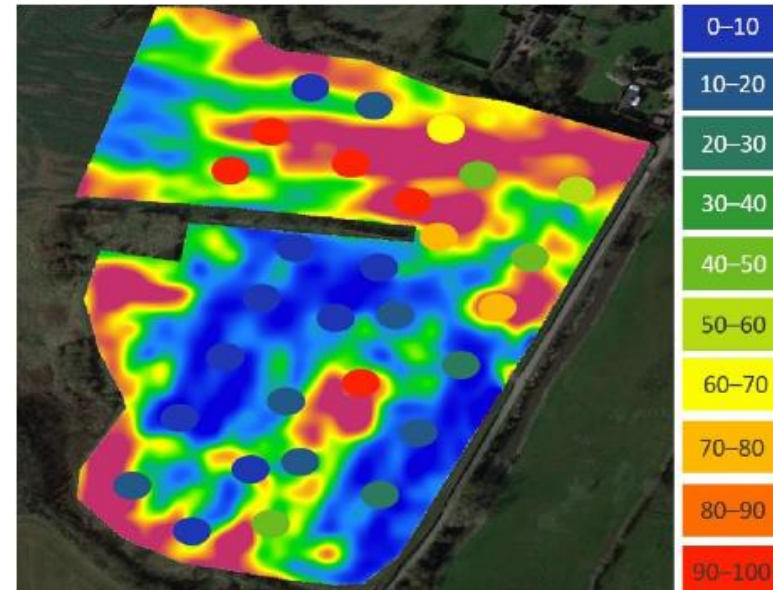


Integrated management

- Soil hygiene to prevent spread
- Liming is effective



Cultivations spreading clubroot across field



NDVI image of a field of oilseed rape, taken in April (background). Coloured circles show the disease severity (0 to 100 scale), determined by a visual crop assessment

- Targeted treatment of the worst clubroot-affected patches can improve economic returns, compared with whole-field approaches

Winter oilseed rape

New described HEAR (High Erucic acid) variety for the UK

	New	Removed
	Resort	Ergo
UK gross output	94	89
E/W gross output	94	89
N gross output	93	92
Lodging	[8]	8
Stem stiffness	8	8
Shortness of stem	6	6
Earliness of maturity	5	6
Stem canker	6	4
Light leaf spot	6	5
TuYV resistant	N	N

Gross output controls: Treated 5.10 t/ha (UK), 5.03 t/ha (E/W), 5.69 t/ha (N)

[]: Limited data

Spring oilseed rape – looking more attractive?

New spring variety for the UK

	New	2019	2018	
	Performer	Lagonda	Lumen	
UK gross output (no fungicides)	[113]	[112]	[105]	LSD 8.5
Oil content	[46.2]	[44.2]	[44.7]	
Shortness of stem	[6]	6	7	
Earliness of flowering	[6]	7	7	
Earliness of maturity	[4]	5	7	

Caution: data is based on a small number of trials

Gross output controls: Treated 3.2 t/ha

New ways of looking at the lists

Variety selection wheat

VARIETYSELECTION

Filter varieties by ¹ **Calculate Agronomic Merit on X-axis** ²

End-use group: All

Variety: All

Septoria tr. rating: 4.3, 8.2

Yellow rust rating: 4.5, 8.9

Brown rust rating: 2.8, 8.4

Mildew rating: 2.8, 8.2

Fusarium rating: 5.2, 7.0

Eyespot rating: 3.2, 7.1

Lodging (+) rating: 6.4, 8.1

Lodging (-) rating: 6.0, 7.6

Sprouting rating: 4.0, 7.2

Yield (early drilled): 91, 109

Yield (late drilled): 94, 110

Yield (light soils): 92, 108

Yield (heavy soils): 96, 105

Yield (2nd cereal): 93, 104

HFN: 151, 321

Specific weight: 73.8, 80.7

Protein (milling) %: 11.2, 13.5

UK distilling suitability: All

Export suitability: All

Ripening days: All

Latest safe sowing date: All

Height (-PGR): 78, 92

OWBM resistance: All

Clear all filters

Select regional yield measure on Y-axis ⁴

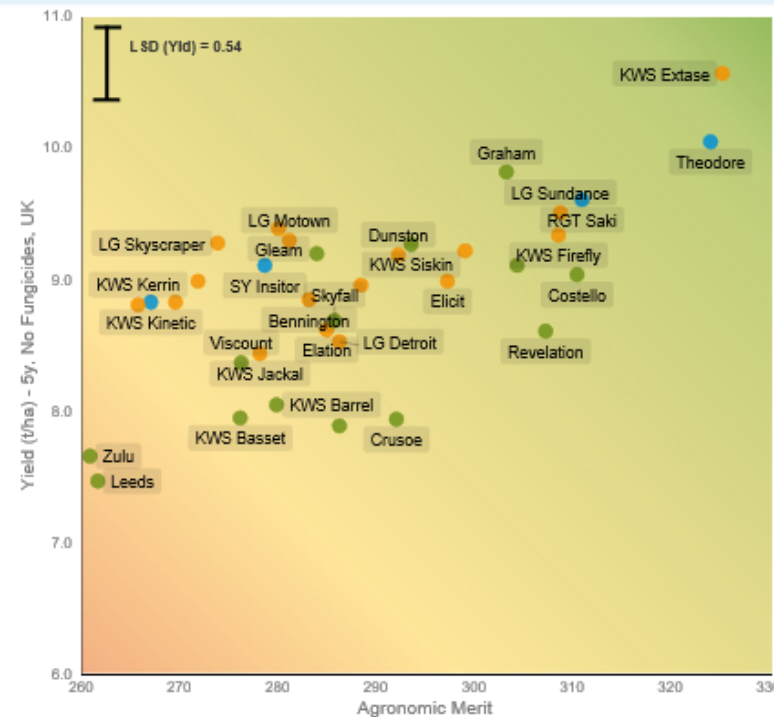
5 year data: UK (+F), East (+F), North (+F), West (+F), **UK (-F)**, UK (TB)

Last year data: UK (-F), UK (TB)

Distinguish variety points in graph by ⁵

Years on RL: [dropdown]

● NEW ● 2-4 ● 5 or more



RL pocket books are changing to an App

KWS Zyatt Winter wheat

AHDB RECOMMENDED UK ukp

A high-yielding **nabim** Group 1 variety

KWS UK
01763 207300
kws-uk.com

Quartz x Hereford

Grain yield (as % control)				
UK	East	West	North	Untreated
101	100	101	99	86

Quality	
Endosperm texture	Hard
Protein content (%)	12.1 Medium
Protein content (%) – Milling spec	13.2
Hagberg falling number	283 High
Specific weight (kg/hl)	78.3 High

Agronomic features	
Lodging resistance no PGR (1–9)	7 Medium-high
Lodging resistance with PGR (1–9)	8 High
Height (cm)	83 Short
Ripening (days +/- JB Diego)	0 Medium

Disease resistance (1–9)	
Mildew	7 Medium-high
Yellow rust	8 High
Brown rust	6 Medium
Septoria nodorum	[6] Medium
Septoria tritici	6.4 Medium
Eyespot	7@ High
Fusarium ear blight	6 Medium
Orange wheat blossom midge	-

Rotation	
First cereal (% control)	100
Second cereal (% control)	101

Notes

@ = Believed to carry the 'Rendezvous' *Pcht* eyespot resistance gene but this has not been verified in Recommended List tests.

nabim comment: This variety shows good gluten strength and milling quality, alongside a good baking performance. As a high-yielding variety, nitrogen applications may need to be adjusted to achieve protein specifications.

4 Winter wheat - nabim Group 1

What coming over the horizon for OSR varieties



Pod shatter resistance

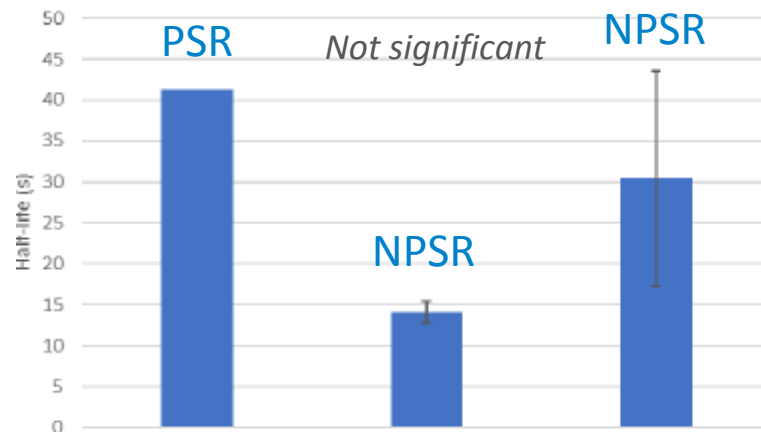
- Losses average 10% and can exceed 70% under adverse weather conditions
- Pod Shatter Resistance is not currently tested for in RL
- Breeders are claiming pod shatter resistance for varieties
- Nature of expression of pod shatter resistance differs
 - Quantitative – degrees of resistance present in different varieties
 - or
 - Qualitative – either a variety has it or not



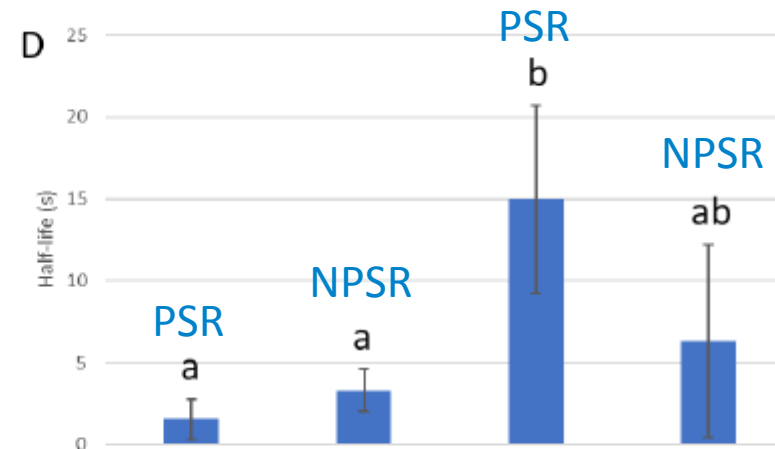
Evaluation of pod shatter resistance testing of oilseed rape

- AHDB working with John Innes Centre in Norwich to develop a testing protocol for pod shatter resistance that the RL can use
- Based on the JIC 'random impact test'
- Samples from RL trials of varieties claiming pod shatter resistance and those not claiming resistance have been tested in the last two seasons

Site 1



Site 2



But poor quality samples

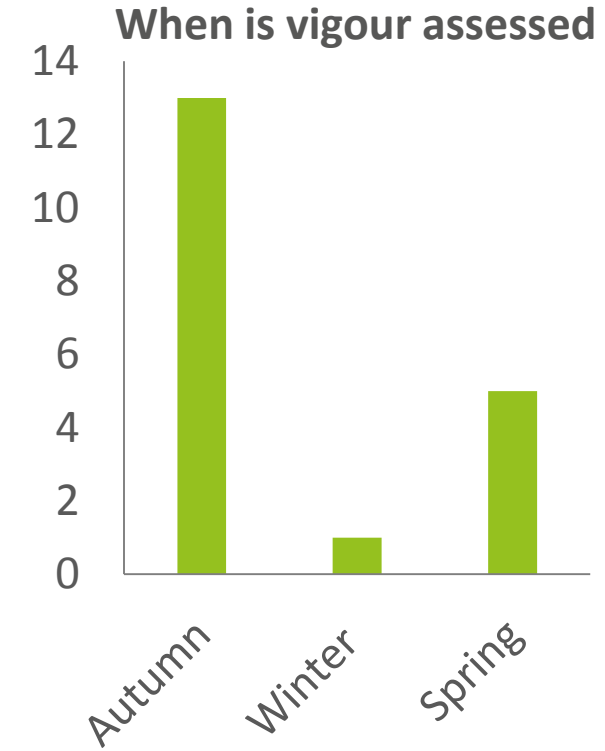
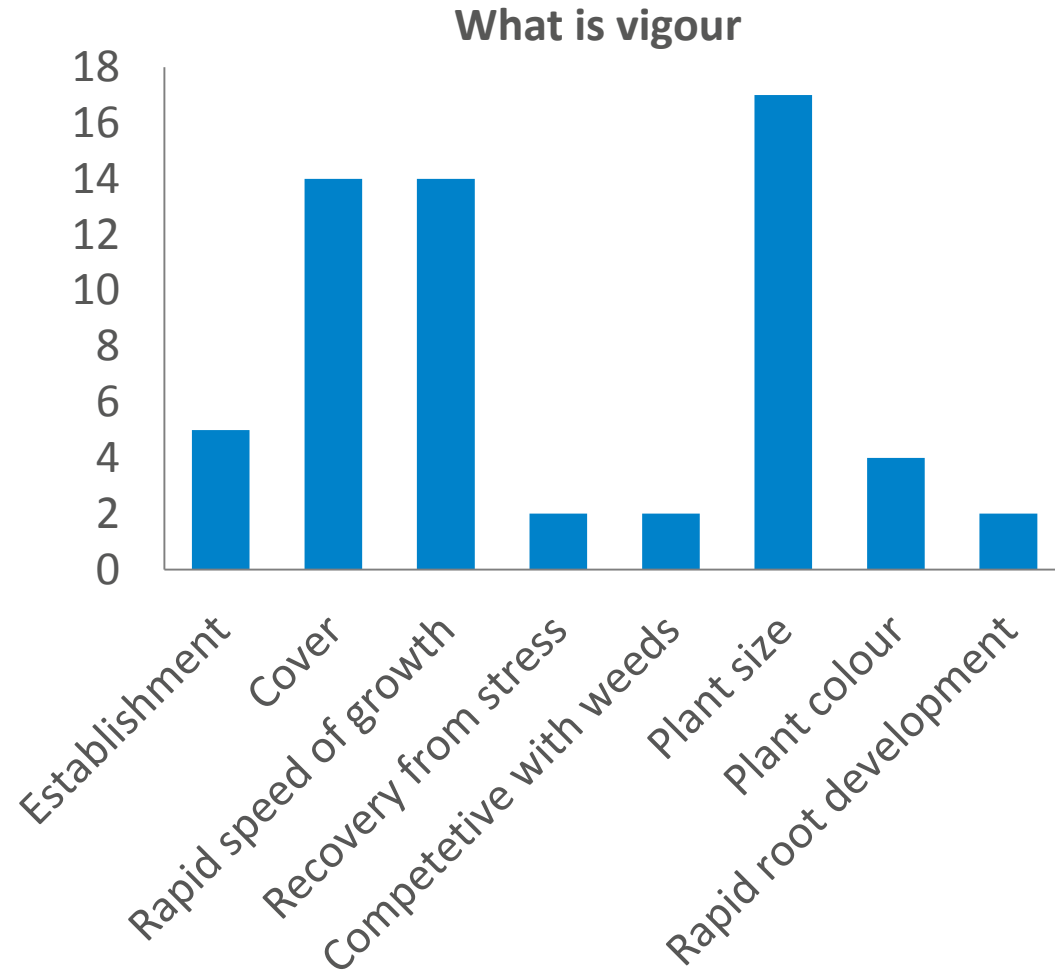
Where next?

- Testing will continue for harvest 2020
- Options for the RL
 - Accept a breeders claim
 - Test claimed PSR varieties against a susceptible standard
 - Test all varieties for PSR
 - Yes/no or 1-9 scale?

Vigour

- Everybody want it but no one is quite sure what it is
- RL board has instructed us to look at it
- Currently no agreed definition
- Currently no agreed method of measuring it
- Currently reviewing what we can do
- Funds (outside RL budget) have been set aside for work
- Working with EU H2020 project looking to standardise VCU testing across Europe – it may look at vigour
- Aim is to develop a protocol that can used to give a standard measure

Where are we?



Verticillium wilt (stem stripe) ratings

- *V. longisporum* was initially confirmed in England in 2007.
- Crop Monitor surveys suggest up to 20% of crops may be affected but very variable year to year
- Research work with the RL has been investigating the possibility of developing disease ratings
- An assessment method has been developed with NIAB
- Plan is to start trialling in 2021 (Harvest 2022)
- 4 disease resistance categories rather than a 1-9 scale
- Categories are for symptom expression and not the effect of the disease on yield
- BUT – NL will not test varieties, so data will be limited



Cabbage stem Flea beetle – what can varieties offer?

- Anecdotal and some experimental evidence suggests a number of agronomic practices may help
 - Early drilling (adult feeding)
 - Late drilling (larval damage)
 - Trap cropping
 - Mowing/grazing
 - Things that smell
 - Companion cropping (buckwheat, mustard)
- Anecdotal evidence suggests some varieties may be more damaged than others

BUT

- 3 year AHDB project, led by ADAS - **No** significant differences in adult damage or larval numbers between different varieties

Genetics of the interaction between rapeseed and the cabbage stem flea beetle

(PhD student Jessica Hughes funded by AHDB & Elsoms)

- Egg inoculation pilot experiment confirms that *Sinapis alba* (white mustard) shows resistance to CSFB herbivory

Adult damage

- There is significant variation in feeding preferences of the adult cabbage stem flea beetle between OSR lines in controlled environment testing
- Some of these differences appear to be maintained in the field

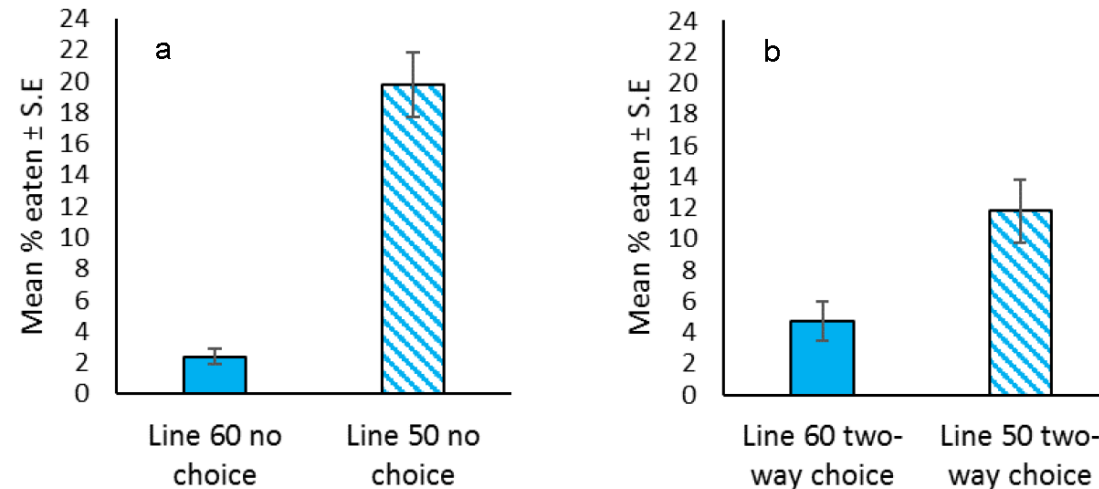


Figure 2: Mean feeding damage from adult CSFB to cotyledons of two *B.napus* lines when either offered a) either line 50 or 60 only, or b) both lines 50 and 60 simultaneously.

Larval survival

- Adult emergence from soil differs significantly between *Brassica napus* lines

Variation in adult emergence identified between two genotypes of *Brassica napus*:

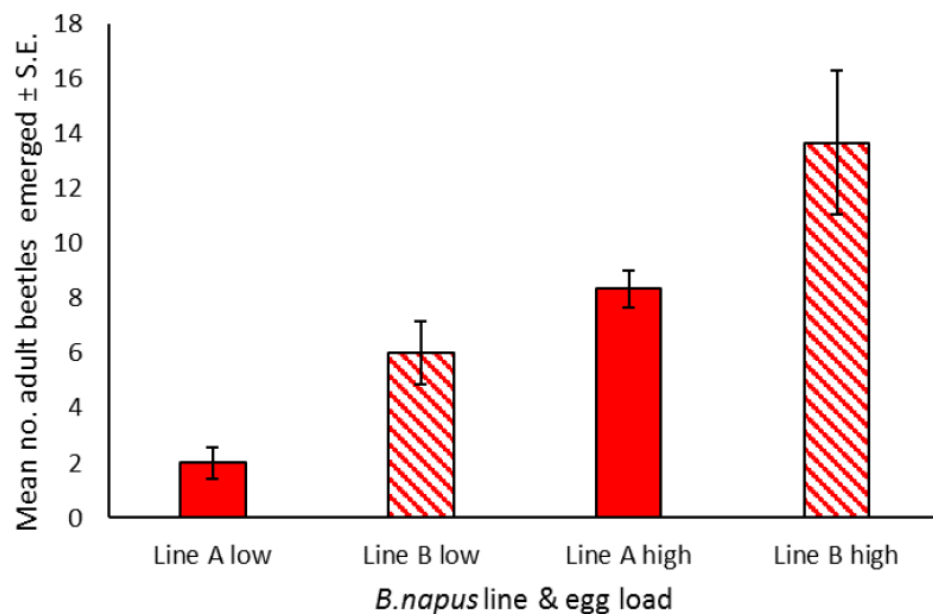


Figure 1: Mean number of adults emerged from soil of two *B.napus* lines, with either low (10) or high (20) egg load.

- Provisional candidate genes have been identified and are being explored

Caution: this is early data and we are a long way off resistant varieties

Summary

- Recommended Lists will continue to support innovation in the oilseeds
- Seek to encourage new traits that are of value to growers
- There will continue to be a parallel programme of research to support variety development and agronomy of oilseeds
- We want growers to see the AHDB Oilseeds Recommended Lists as the gold standard