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FAR CULTIVAR EVALUATION



FOUNDATION FOR ARABLE RESEARCH



**spring sown  
wheat and barley  
2023/2024**

<b>introduction and welcome</b>	3
<b>WINTER/SPRING SOWN WHEAT</b>	
2023/2024 trial site location map and details	4
agronomic comment	6
cultivar evaluation – 2023/2024 season:	
– yields (t/ha)	7
– grain quality data – by region	8
cultivar evaluation – 4-year adjusted mean – relative yield by site	9
cultivar descriptions	10
<b>WINTER/SPRING SOWN BARLEY</b>	
2023/2024 trial site location map and details	14
agronomic comment	17
cultivar evaluation – 2023/2024 season:	
– yields (t/ha)	18
– grain quality data – by region	20
cultivar evaluation – 4-year adjusted mean – relative yield by site	22
cultivar descriptions	24
<b>sowing date guidelines</b>	32
<b>sowing rate calculation</b>	33
<b>establishment</b>	34
<b>seed quality and seed treatments</b>	35
<b>glossary of terms</b>	37
<b>paddock sowing record</b>	39
<b>acknowledgements</b>	40

Drier weather conditions across the country, from sowing through to grain fill, resulted in mostly average to above average regional yields in the 2023-24 season.

The lower North Island experienced below average rainfall from sowing until harvest, a change from previous seasons where rainfall has been above average. Despite the dry, barley yields were around 1 t/ha higher on average than the 4-year mean, although the wheat site at Cheltenham was back around half a ton per hectare.

On average, spring barley yields in Canterbury were similar to the 4-year mean, while spring wheats were around 1 t/ha higher than the 4-year mean. Most parts of Canterbury experienced below average summer rainfall, especially south Canterbury which had eight months of below average rainfall between April and February. Hail took out the spring barley site in Methven.

Spring rainfall was mostly average to above average in Southland, although prolonged rainfall delayed harvest in some areas. The Balfour spring barley site was up 1 t/ha on the 4-year mean, while the Chatton site was excluded due to variability.

To find out more about the weather at each trial location, head to the FAR website [www.far.org.nz](http://www.far.org.nz) and search for Harvest Snippets 2024. These documents include monthly weather summaries over the growing season.

Joanne Drummond  
Cereals Manager

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CPT Manager

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2023/2024 trial site location map

### CHELTHENHAM - MANAWATU

Kiwitea silt loam, Dryland  
**Trial operator:** Kevin Sinclair,  
 Plant & Food Research  
**Host farmer:** John Ridd

This trial was sown on 21 September 2023 in a surrounding crop of cv. Sensas, following pasture. Soil N measured 27 kg N/ha (0-60 cm) and a further 159 kg N/ha was applied as DAP<sup>®</sup> pre-drill, Sustain<sup>®</sup> mid-October and urea in November. During the season the trial received two herbicide and one insecticide applications. The fungicide programme consisted of Kestrel<sup>®</sup> late-October followed by a Phoenix<sup>®</sup> and Kestral<sup>®</sup> mix in November and a Bolide<sup>®</sup> and Elatus Plus<sup>®</sup> mix in early December. Some minor lodging was noted when the trial was harvested on 16 February 2024.

### SHEFFIELD - CENTRAL CANTERBURY

Eyre shallow silt loam, Irrigated  
**Trial operator:** Doug Bowron,  
 Plant & Food Research  
**Host farmer:** Marty Skurr

This trial was sown into a crop of cv. Reliance on 24 August 2023, following kale. The trial received 115 kg N/ha from two applications of urea, on top of 29 kg N/ha soil N (0-60 cm). A herbicide mix and an insecticide went on at the end of October. A mix of Stellar<sup>®</sup> and Pyrax<sup>®</sup> fungicide was applied late November. The trial was harvested on 8 February 2024.

### METHVEN - MID CANTERBURY

Gorge moderately deep silt loam, Irrigated  
**Trial operator:** Ashley Harrison,  
 PGG Wrightson Grain  
**Host farmer:** David Wright

This trial was sown on 21 August 2023 in a crop of cv. Discovery, following rape. Soil N measured 53 kg N/ha (0-60 cm) with a further 214 kg N/ha coming from a pre-drill application of Crop 15 plus urea and two applications of N Protect<sup>®</sup>. The trial received a herbicide in late-September followed by a PGR mix mid-November. The four-spray fungicide programme consisted of Protiva<sup>®</sup> in mid-October, with Opus<sup>®</sup> followed by a mix of epoxiconazole and Elatus Plus<sup>®</sup> in November, and a Comet<sup>®</sup> and Prosaro<sup>®</sup> mix in December. This irrigated trial was harvested on 19 February 2024.

### SEAFIELD - MID CANTERBURY

Wakanui clay, Irrigated  
**Trial operator:** Doug Bowron,  
 Plant & Food Research  
**Host farmer:** Simon Bonifant

This trial was sown into a crop of cv. Discovery on 25 August 2023, following rape. Three applications of N Protect<sup>®</sup> provided 230 kg N/ha. The trial received two post-emergent herbicide applications, two applications of Karate<sup>®</sup> insecticide plus a PGR mix of Moddus<sup>®</sup> and Cycocel<sup>®</sup>. The fungicide programme consisted of an Amistar<sup>®</sup> and Kestrel<sup>®</sup> mix followed by an Elatus<sup>®</sup> and Bolide<sup>®</sup> mix in November, with Amistar<sup>®</sup> and Prosaro<sup>®</sup> in a mix in December. Irrigation totalling 180 mm was applied over four applications. The trial was harvested on 24 February 2024.

## wheat - agronomic comment

CULTIVAR	Years in CPT2 trials	Septoria tritici blotch	Stripe rust	Leaf rust	Powdery mildew	Fusarium head blight	Straw strength	Crop height	Maturity	Sprouting susceptibility
Cochise	4	MR	MR	MSS	MR	MRMS	Stiff	Medium	Early	Moderate
Conquest	21	MS	(MS)	S	MS	MS	Moderate-stiff	Medium	Early-int	Very low
Discovery	11	MSS	MRMS	MR*	MRR	MSS	Stiff	Tall	Intermediate	Mod-high
Raffles	22	MSS	MSS	S*	MR	MSS	Moderate	Tall	Intermediate	Low
Reliance	12	MS	MR	S	MS	MSS	Moderate-stiff	Short-medium	Early-int	Low
Sensas	14	MS	MRMS*	S	MR	S	Stiff	Medium	Early	Low
Viceroy	14	S	MR	S*	MS	S	Stiff	Medium-tall	Intermediate	Low-moderate
CRWT278	1	MS	(MRR)	(MR)	MRR	MRMS	Moderate	Medium	Early-int	Low-moderate

Scores followed by \* indicate resistance is affected by pathotypes present (score is an average).

(Brackets) indicate there is limited New Zealand trial data to assess resistance (i.e. the cultivar has either been in trials for less than three years and/or disease pressure has been low or the rating has changed this season)

Disease susceptibility sourced from FAR-funded Disease Nurseries (assessments carried out by Plant & Food Research).

Sprouting susceptibility scores are an indication of susceptibility to preharvest sprouting. Data sourced from FAR-funded Sprouting Nurseries (assessments carried out by Plant & Food Research).

## Key

S = susceptible  
 MSS = mostly susceptible  
 MS = moderately susceptible  
 MRMS = intermediate resistance  
 MR = moderately resistant  
 MRR = mostly resistant  
 R = resistant

## Spring Sown Wheat Cultivar Evaluation 2023/2024 Season - yield (t/ha)

CULTIVAR	Grade		Cheltenham	Sheffield	Methven		Seafield		Canterbury mean yield	Seasons in FAR trials (Spring sown)
	Manawatu	Central Canterbury			Mid Canterbury	Gorge silt loam	Mid Canterbury	Wakanui clay loam		
Region										
Soil type			Kiwieta silt loam	Eyre shallow silt loam						
Dryland/Irrigated			Dryland	Irrigated						
Previous crop			Pasture	Kale						
Sow date			21 Sep	24 Aug						
Harvest date			16 Feb	8 Feb						
Raffles		Gristing	7.4	<b>8.5</b>	9.8		<b>12.4</b>	<b>10.2</b>	22	
Cochise		Medium	7.5	7.8	10.8		<b>12.8</b>	<b>10.5</b>	4	
Discovery		Medium	<b>8.5</b>	7.4	10.4		11.9	<b>9.9</b>	11	
Viceroy		Medium	7.6	<b>8.7</b>	9.7		11.0	9.8	14	
CRWT278		Medium	<b>8.7</b>	<b>8.8</b>	<b>11.3</b>		11.7	<b>10.6</b>	1	
Sensas		Med/Prem	8.1	<b>8.5</b>	9.9		11.2	<b>9.9</b>	14	
Conquest		Premium	7.8	7.8	9.5		11.2	9.5	21	
Reliance		Premium	7.9	8.0	9.9		10.9	9.6	12	
Site mean yield (t/ha)			7.9	8.4	10.3		11.6	10.1		
LSD (p= 0.05)			0.4	0.5	0.3		0.4	0.8		
CV (%)			3.5	4.5	2.0		2.6	4.6		

Figures in bold indicate the cultivar was amongst the highest yielding group of cultivars.

Grade has been provided by the breeder/agent and does not guarantee a contract will be issued for that cultivar.

## wheat - 2023/2024 yield (t/ha)



## Spring Sown Wheat Grain Quality Data 2023/2024 Season

### Canterbury

CULTIVAR	Grade	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)
Raffles	Gristing	49	79	12.4	0.9	416
Cochise	Medium	48	80	12.4	0.6	321
Discovery	Medium	50	79	12.8	0.5	377
Viceroy	Medium	43	83	13.0	1.1	393
CRWT278	Medium	50	79	12.8	0.6	339
Sensas	Med/Prem	47	83	13.0	0.7	384
Conquest	Premium	46	81	13.6	0.5	411
Reliance	Premium	45	79	13.3	1.0	388
Mean		47	81	12.9	0.7	379
LSD (p=0.05)		6.3	1.4	1.1	0.6	57

Averaged over three sites.

### Southern North Island

CULTIVAR	Grade	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)
Raffles	Gristing	44	79	13.0	0.5	470
Cochise	Medium	47	78	12.3	0.5	322
Discovery	Medium	43	78	12.9	0.5	406
Viceroy	Medium	37	79	12.8	2.3	403
CRWT278	Medium	41	76	12.7	1.5	392
Sensas	Med/Prem	44	82	13.2	0.5	385
Conquest	Premium	37	77	13.3	1.7	385
Reliance	Premium	40	77	13.5	0.7	387
Mean		42	78	13.0	1.0	394
LSD (p=0.05)		-	-	-	-	-

Single trial - no LSD.

Grade has been provided by the breeder/agent and does not guarantee a contract will be issued for that cultivar.

The quality data for each region is also presented as a 4-year mean on the individual cultivar description pages.

### Spring Sown Wheat - 4-year adjusted mean - relative yield by site

CULTIVAR	Region	Dryland/Irrigated	No. of trials	Grade	Feilding		Sheffield		Methven		Wakanui		Canterbury mean yield	Seasons in CPT2 trials (Spring sown)
					Manawatu	Dryland	Central Canterbury	Irrigated	Mid Canterbury	Irrigated	Mid Canterbury	Irrigated		
Raffles				Gristing	99	4	104	99	4	105	4	12	22	
Cochise				Medium	<b>107</b>		<b>106</b>	<b>100</b>		<b>111</b>		<b>102</b>	4	
Discovery				Medium	<b>104</b>		<b>103</b>	<b>103</b>		<b>105</b>		<b>104</b>	11	
Viceroy				Medium	94		<b>104</b>	94		98		98	14	
CRWT278				Medium	<b>(109)</b>		<b>(109)</b>	<b>(113)</b>		<b>(101)</b>		<b>(107)</b>	1	
Sensas				Med/Prem	100		<b>97</b>	93		97		96	14	
Conquest				Premium	93		89	97		95		94	21	
Reliance				Premium	94		90	<b>100</b>		89		93	12	
Site mean yield (t/ha)					8.3		7.2	8.8		10.7		8.9		
LSD (estab. cv) (p=0.05)					8		16	13		6		8		
LSD (new vs estab.) (p=0.05)					13		25	21		9		13		

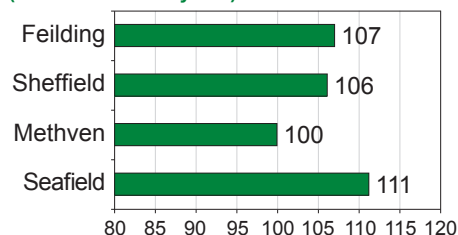
LSD (estab. cv) is for comparing two "established" cultivars (that have both been in all trials).  
 LSD (new vs estab.) is for comparing a "new" (first year) cultivar with an "established" cultivar.  
 Bold text indicates the cultivar was amongst the highest yielding group of cultivars (based on estab. cv LSD).  
 Grade has been provided by the breeder/agent and does not guarantee that a contract will be issued for that cultivar.  
 Figures in brackets as they are only based on one year of data.

## COCHISE

YEAR 4

A mostly high yielding, medium grade milling and feed variety. Has resistance to most diseases, with the exception of leaf rust. Below average falling number. A medium height variety with stiff straw and early maturity.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Moderately resistant
Stripe rust	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Moderately resistant
Fusarium head blight	Intermediate resistance

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Early
Sprouting risk	Moderate

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

TGW (g)	48	49
Test weight (kg/hl)	74	74
Protein (%) (N% x 5.7)	10.8	12.1
Screenings (%)	0.7	1.0
Falling number (sec)	243	264

END USE	Medium grade milling, feed
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### BACKGROUND

Breeder	KWS, UK
Agent	Carrfields Grain & Seed

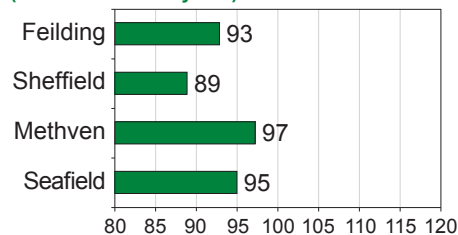
Sth Nth Is (Southern North Island).

## CONQUEST<sup>PVR</sup>

YEAR 21

A high protein content, premium milling cultivar, with a similar yield to cv. Reliance. Shows susceptibility to most diseases. Early to intermediate maturity with high test weights and falling numbers, and very low risk of sprouting.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Moderately susceptible
Stripe rust	Moderately susceptible
Leaf rust	Susceptible
Powdery mildew	Moderately susceptible
Fusarium head blight	Moderately susceptible

### FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Early-intermediate
Sprouting risk	Very low

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

TGW (g)	39	42
Test weight (kg/hl)	75	76
Protein (%) (N% x 5.7)	12.6	13.0
Screenings (%)	1.3	1.3
Falling number (sec)	378	373

END USE	Premium milling
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### BACKGROUND

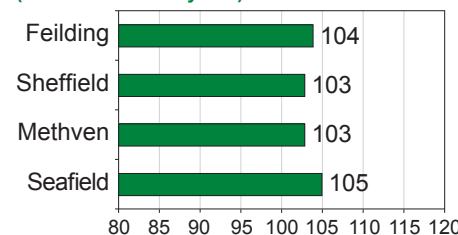
Breeder	Plant & Food Research
Agent	Luisetti Seeds

## DISCOVERY<sup>PVR</sup>

YEAR 11

Medium grade milling cultivar producing above average yields consistently across all sites. Mostly susceptible to Septoria tritici blotch and Fusarium head blight, but has some degree of resistance to other diseases. A strong plant growth regulator programme is recommended to reduce both lodging and shattering risk. High grain weights and moderate to high sprout risk.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Mostly susceptible
Stripe rust	Intermediate resistance
Leaf rust	Moderately resistant**
Powdery mildew	Mostly resistant
Fusarium head blight	Mostly susceptible

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Tall
Maturity	Intermediate
Sprouting risk	Moderate-high

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

TGW (g)	46	47
Test weight (kg/hl)	74	74
Protein (%) (N% x 5.7)	11.4	12.3
Screenings (%)	0.5	0.8
Falling number (sec)	348	331

END USE	Medium grade milling
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### BACKGROUND

Breeder	Limagrain Europe S.A.
Agent	PGG Wrightson Grain

Sth Nth Is (Southern North Island).

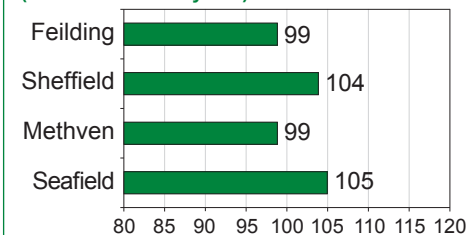
\*\* Resistance is affected by pathotypes present (score is an average).

## RAFFLES

YEAR 22

Average to above average feed and gristing wheat when sown in the spring. Watch for disease, as cv. Raffles is susceptible to most diseases, with the exception of powdery mildew. Good grain weight, with low sprouting risk and a high falling number. A tall variety with intermediate maturity.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Mostly susceptible
Stripe rust	Mostly susceptible
Leaf rust	Susceptible**
Powdery mildew	Moderately resistant
Fusarium head blight	Mostly susceptible

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Tall
Maturity	Intermediate
Sprouting risk	Low

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

TGW (g)	46	44
Test weight (kg/hl)	75	74
Protein (%) (N% x 5.7)	11.2	12.3
Screenings (%)	0.4	1.0
Falling number (sec)	396	419

END USE	Feed, gristing
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### BACKGROUND

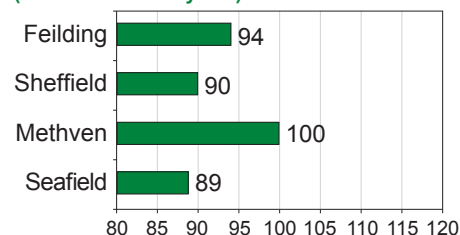
Breeder	KWS, UK
Agent	Carrfields Grain & Seed

## RELIANCE<sup>PVR</sup>

YEAR 12

A New Zealand bred, premium milling cultivar with yields similar to cv. Conquest. Monitor for disease, as cv. Reliance is susceptible to most diseases, with the exception of stripe rust. A moderate to stiff strawed cultivar producing high proteins and falling number, with low sprouting risk.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Moderately susceptible
Stripe rust	Moderately resistant
Leaf rust	Susceptible
Powdery mildew	Moderately susceptible
Fusarium head blight	Mostly susceptible

### FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Short-medium
Maturity	Early-intermediate
Sprouting risk	Low

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

TGW (g)	41	42
Test weight (kg/hl)	73	75
Protein (%) (N% x 5.7)	12.3	13.2
Screenings (%)	1.1	1.9
Falling number (sec)	395	380

END USE Premium milling

### BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds

Sth Nth Is (Southern North Island).

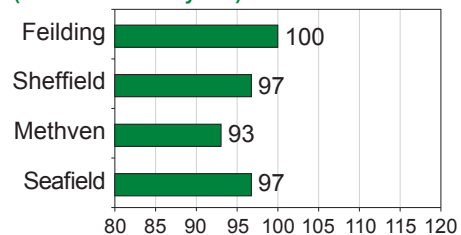
\*\* Resistance is affected by pathotypes present (score is an average).

## SENSAS<sup>PVR</sup>

YEAR 14

A premium and medium grade milling wheat. Cv. Sensas is the only true spring wheat cultivar in New Zealand. It is well suited to late spring sowings because of its true spring character and early maturity, and should not be planted before July to avoid frost risk at flowering. Moderately susceptible to Septoria tritici blotch and susceptible to leaf rust and Fusarium head blight. Low sprouting risk and good grain weight and falling number.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Moderately susceptible
Stripe rust	Intermediate resistance**
Leaf rust	Susceptible
Powdery mildew	Moderately resistant
Fusarium head blight	Susceptible

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Early
Sprouting risk	Low

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

TGW (g)	44	43
Test weight (kg/hl)	80	78
Protein (%) (N% x 5.7)	11.9	12.7
Screenings (%)	0.4	0.8
Falling number (sec)	366	388

END USE Premium and medium grade milling

### BACKGROUND

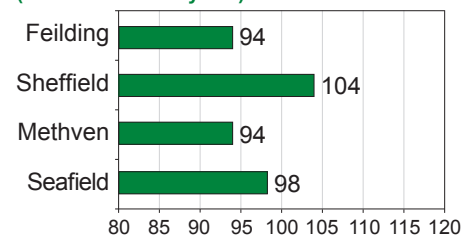
Breeder	RAGT, France
Agent	PGG Wrightson Grain

## VICEROY<sup>PVR</sup>

YEAR 14

A New Zealand bred, medium grade milling wheat. Monitor for disease, as cv. Viceroy shows susceptibility to most diseases, with the exception of stripe rust. Good test weight and falling number. This variety has a stiff straw with low to moderate sprouting risk.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Susceptible
Stripe rust	Moderately resistant
Leaf rust	Susceptible**
Powdery mildew	Moderately susceptible
Fusarium head blight	Susceptible

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium-tall
Maturity	Intermediate
Sprouting risk	Low-moderate

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

TGW (g)	41	41
Test weight (kg/hl)	79	79
Protein (%) (N% x 5.7)	11.9	12.4
Screenings (%)	1.0	1.5
Falling number (sec)	370	388

END USE Medium grade milling

### BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds

Sth Nth Is (Southern North Island).

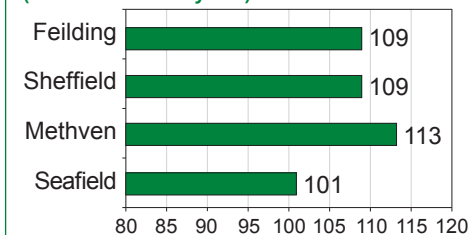
\*\* Resistance is affected by pathotypes present (score is an average).

## CRWT278

YEAR 1

A mostly high yielding medium grade milling wheat in its first year of CPT 2 trials. Moderately susceptible to Septoria tritici blotch, but shows resistance to other common cereal diseases. Protein levels similar to cv. Viceroy with a lower falling number. A medium height variety with low to moderate sprouting risk.

### RELATIVE YIELDS – 4-year adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Septoria tritici blotch	Moderately susceptible
Stripe rust	Mostly resistant
Leaf rust	Moderately resistant
Powdery mildew	Mostly resistant
Fusarium head blight	Intermediate resistance

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate
Sprouting risk	Low-moderate

### GRAIN QUALITY (4-year means) Sth Nth Island Canterbury

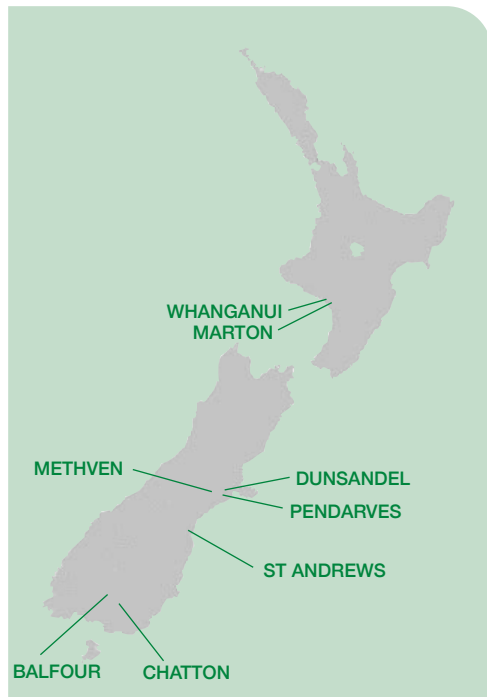
TGW (g)	43	47
Test weight (kg/hl)	73	74
Protein (%) (N% x 5.7)	11.4	12.5
Screenings (%)	1.3	1.0
Falling number (sec)	355	318

END USE Medium grade milling

### BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds





2023/2024 trial site location map

### WHANGANUI

Marion clay loam, Dryland  
**Trial operator:** Kevin Sinclair,  
 Plant & Food Research  
**Host farmer:** James Campbell

This dryland trial was sown on 31 October 2023 into a field of cv. SY Transformer following maize. Soil N measured 33 kg N/ha (0-60 cm) and further N was applied in the form of DAP (18 kg N/ha) and organic fish fertiliser. A pre-emergent herbicide was applied. A mix of Revystar® and Phoenix® fungicide went on towards the end of December. The trial grew well, although some low-level lodging was recorded at harvest on 15 February 2024.

### MARTON

Kiwitea loam, Dryland  
**Trial operator:** Kevin Sinclair,  
 Plant & Food Research  
**Host farmer:** Murray and Brenton Knox

This dryland trial was sown on 6 November 2023 in a paddock of cv. 14007-026 following forage brassica. Soil N measured 96 kg N/ha (0-60 cm) and a further 49 kg N/ha came from Sustain® and YaraMila® Complex. A herbicide mix was applied late November. The fungicide programme consisted of Proline® in late November followed by Phoenix® and Revystar® mix in December. Lodging was recorded but the crop was combined successfully on 21 February 2024.

### DUNSANDEL

Mayfield silt loam, Irrigated  
**Trial operator:** Matt Hicks,  
 Cropmark Seeds Ltd  
**Host farmer:** Simon Barnett

The trial was sown on 20 September 2023 in a paddock of cv. SY Transformer following green feed oats. Base fertiliser plus an application of N-Protect® provided 109 kg N/ha. Three applications of herbicide, one insecticide, and two PGRs were applied during the growing season. The two-spray fungicide programme consisted of a Comet®, Kestrel® and Phoenix® mix in November, followed by Revystar® in early December. Four irrigations supplied 140 mm of water. The trial was harvested on 26 February 2024.

### METHVEN

Lyndhurst silt loam, Irrigated  
**Trial operator:** Matt Hicks,  
 Cropmark Seeds Ltd  
**Host farmer:** Brendon Moore

The trial established well but was not harvested due to hail damage.

### PENDARVES

Lismore silt loam, Irrigated  
**Trial operator:** Doug Bowron,  
 Plant & Food Research  
**Host farmer:** Simon Bonifant

The trial was sown on 7 September 2023 in a paddock of cv. Laureate following green feed oats. 150 kg N/ha was applied to the crop over three applications. A herbicide mix, two Karate® insecticides and Moddus® and Cycocel® PGR followed by Terpal® were applied during the growing season. A Kestrel® and Comet® fungicide mix went on in early November, followed by a mix of Revylution® and Vimoy®. Five irrigation passes supplied 100 mm of water. Most cultivars experienced minor to moderate lodging. The trial was harvested on 22 February 2024.

### ST ANDREWS

Claremont silt loam, Dryland  
**Trial operator:** Matt Hicks,  
 Cropmark Seeds Ltd  
**Host farmer:** Shawn Miller

This dryland trial was sown on 14 September 2023 in a paddock of cv. Tavern following oats. Base fertiliser plus an application of Sustain® provided 134 kg N/ha. Two herbicide applications plus Karate® insecticide were applied. The fungicide programme consisted of a Comet® and Kestrel® mix in November, followed by a mix of Comet®, Phoenix® and Revylution® at growth stage 49. The trial was harvested on 15 February 2024.

### BALFOUR

Nokomai and Athol loam, Dryland  
**Trial operator:** Chetan Parab,  
 Plant & Food Research  
**Host farmer:** Wilkins Farming

This dryland trial was sown on 20 October 2023 into a field of cv. Sanette following kale. The trial received 178 kg N/ha in the form of DAP and urea. Two applications of herbicide and a PGR were applied during the growing season. The three-spray fungicide programme comprised of Proline® followed by an Acanto®, Proline®, Phoenix® mix, with a final application mix of Phoenix® and Revystar®. A mechanical issue occurred during harvest on 10 April 2024 and the remaining harvest was completed on 22 April 2024.

### CHATTON

Waikoikoi silt loam, Dryland  
**Trial operator:** Chetan Parab,  
 Plant & Food Research  
**Host farmer:** John Gardyne

Data not published due to high variability in the trial.

Spring Sown Barley Agronomic Comment 2023/2024 Season

CULTIVAR	Years in CPT2 trials	Scald	Net blotch (net form)	Leaf rust	Powdery mildew	Straw strength	Crop height	Maturity
Buttress	9	(MSS)	MR	MS	MRR	Moderate	Med-tall	Intermediate
Fortitude	10	MR	MR	MS*	MRR	Moderate	Medium	Intermediate
Laureate	8	MRMS	MR	MS*	MRR	Moderate	Medium	Intermediate
Milford	11	MS	MS	MS*	MRR	Stiff	Short	Intermediate
RGT Planet	10	MR	MS	MS	MRR	Moderate	Medium	Early-int
SY Dolomite	6	MRMS	MRMS	MS	(R)	Moderate-stiff	Medium	Intermediate
SY Silhouette	7	(MRMS)	MR	MS	(R)	Stiff	Medium	Late
SY Solar	4	(S)	(MRMS)	MSS	(R)	Stiff	Medium	Early-int
SY Transformer	5	MRMS	MR	MS	(R)	Moderate-stiff	Medium	Intermediate
CRBA164	4	S	MR	MSS	(R)	Moderate-stiff	Medium	Intermediate
CRBA173	2	<b>(MRMS)</b>	MRMS	<b>(MRMS)</b>	MR	Moderate	Medium	Early-int
CRBA180	1	(MR)	(MRMS)	MS	Unknown	Moderate	Medium	Intermediate
KSB2209	1	(MR)	MRMS	MRMS	Unknown	Moderate-stiff	Medium	Intermediate
SY418-250	2	MR	MRMS	MSS	Unknown	Moderate-stiff	Medium	Intermediate
SY418-336	2	<b>(MR)</b>	MRMS	MS	Unknown	Stiff	Short-med	Intermediate

Disease susceptibility sourced from FAR-funded Disease Nurseries and CPT trials (assessments carried out by Plant & Food Research). Scores followed by \* indicate resistance is affected by pathotypes present (score is an average). (Brackets) indicate there is limited New Zealand trial data to assess resistance (i.e. the cultivar has either been in trials for less than three years and/or disease pressure has been low). Bold text indicates a change in rating.

Key

HS = highly susceptible  
 S = susceptible  
 MSS = mostly susceptible  
 MS = moderately susceptible  
 MRMS = intermediate resistance  
 MR = moderately resistant  
 MRR = mostly resistant  
 R = resistant

## Spring Sown Barley Cultivar Evaluation 2023/2024 Season - yield (t/ha)

CULTIVAR	Whanganui	Marton	Southern NI mean	Dunsandel		Pendarves	St Andrews	Canterbury mean	Balfour	Southland mean	Seasons in CPT2 trials (Spring sown)
Region	Manawatu	Manawatu		Central Canterbury		Mid Canterbury	South Canterbury		Northern Southland		
Soil Type	Marton clay loam	Kiwitea loam		Mayfield silt loam		Lismore silt loam	Claremont silt loam		Nokomai & Athol loam		
Dryland/Irrigated	Dryland	Dryland		Irrigated		Irrigated	Dryland		Dryland		
Previous crop	Maize	Forage brassica		Green feed oats		Green feed oats	Oats		Kale		
Sowing date	31 Oct	6 Nov		20 Sep		7 Sep	14 Sep		20 Oct		
Harvest date	15 Feb	21 Feb		26 Feb		22 Feb	15 Feb		10 Apr		
Buttress	7.9	8.7		8.3	11.2		<b>10.3</b>	7.1	<b>9.5</b>	<b>11.2</b>	
Fortitude	<b>8.0</b>	8.8	<b>8.4</b>	11.1		<b>10.5</b>	7.0	<b>9.5</b>	<b>10.8</b>	<b>10.8</b>	10
Laureate	<b>8.0</b>	8.9	<b>8.5</b>	11.6		9.9	7.5	<b>9.7</b>	9.8	9.8	8
Milford	7.5	8.8	8.1	11.0		9.9	6.5	9.1	8.1	8.1	11
RGT Planet	7.5	8.1	7.8	10.6		8.7	6.2	8.5	9.2	9.2	10
SY Dolomite	<b>8.1</b>	<b>9.4</b>	<b>8.8</b>	<b>11.9</b>		9.1	7.6	9.6	9.7	9.7	6
SY Silhouette	7.8	9.2	<b>8.5</b>	<b>11.7</b>		<b>10.1</b>	<b>7.6</b>	<b>9.8</b>	<b>10.6</b>	<b>10.6</b>	7
SY Solar	7.6	8.4	8.0	11.4		9.4	6.8	9.2	8.6	8.6	4
SY Transformer	7.9	<b>9.3</b>	<b>8.6</b>	<b>11.9</b>		<b>10.3</b>	7.2	<b>9.8</b>	9.9	9.9	5
CRBA164	7.7	9.1	<b>8.4</b>	11.4		9.8	6.7	9.3	8.8	8.8	4
CRBA173	<b>8.0</b>	8.9	<b>8.4</b>	<b>11.7</b>		9.6	<b>7.6</b>	<b>9.6</b>	10.0	10.0	2
CRBA180	<b>8.0</b>	<b>9.3</b>	<b>8.6</b>	<b>11.9</b>		9.8	<b>7.9</b>	<b>9.8</b>	<b>10.4</b>	<b>10.4</b>	1
KSB2209	7.9	9.1	<b>8.5</b>	11.3		<b>10.5</b>	7.3	<b>9.7</b>	<b>10.3</b>	<b>10.3</b>	1
SY418-250	7.9	8.8	<b>8.4</b>	<b>12.1</b>		9.8	<b>7.8</b>	<b>9.9</b>	9.4	9.4	2
SY418-336	<b>8.0</b>	<b>9.4</b>	<b>8.7</b>	<b>12.0</b>		<b>10.3</b>	<b>7.7</b>	<b>10.0</b>	9.3	9.3	2
Site mean yield (t/ha)	7.8	9.0	8.4	11.5		9.9	7.2	9.5	9.7	9.7	
LSD (p=0.05)	0.2	0.2	0.4	0.4		0.6	0.4	0.6	0.9	0.9	
CV (%)	1.6	1.9	2.3	2.5		4.1	3.6	3.7	6.8	6.8	

Figures in bold indicate the cultivar was amongst the highest yielding group of cultivars.

No results from Methven (hail damage) and Chatton (variability).

## Spring Sown Barley Grain Quality Data 2023/2024 Season

### Southern North Island

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Buttress	55	68	10.7	0.9
Fortitude	55	68	10.8	0.6
Laureate	58	65	10.5	0.7
Milford	55	66	10.2	1.0
RGT Planet	56	67	10.8	0.9
SY Dolomite	60	66	10.2	0.8
SY Silhouette	58	64	10.3	1.0
SY Solar	58	66	10.7	0.9
SY Transformer	59	66	10.2	0.6
CRBA164	57	64	10.2	0.5
CRBA173	58	64	9.8	1.2
CRBA180	59	63	10.1	0.8
KSB2209	59	66	10.2	1.0
SY418-250	57	65	9.7	0.8
SY418-336	58	62	10.5	0.9
Mean	57	65	10.3	0.8
LSD (p=0.05)	3	2	0.6	0.6

Mean of 2 trials.

### Canterbury

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Buttress	51	65	11.0	2.4
Fortitude	50	64	10.7	3.6
Laureate	53	61	10.4	4.3
Milford	49	62	10.6	7.1
RGT Planet	52	62	10.8	5.8
SY Dolomite	55	61	10.4	4.8
SY Silhouette	52	60	10.5	4.7
SY Solar	54	62	10.3	4.5
SY Transformer	50	59	10.8	4.9
CRBA164	53	61	10.5	3.0
CRBA173	53	60	10.2	4.2
CRBA180	54	59	10.6	3.6
KSB2209	54	60	10.7	3.2
SY418-250	52	61	9.9	3.5
SY418-336	52	61	10.0	4.2
Mean	52	61	10.5	4.2
LSD (p=0.05)	4	3	0.8	3.1

Mean of 3 trials (no result from Methven).

The quality data for each region is also presented as a 4-year mean on the individual cultivar description pages.

### Southland

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Buttress	52	66	13.1	2.3
Fortitude	49	65	13.9	1.7
Laureate	52	65	13.0	2.0
Milford	48	63	11.9	4.0
RGT Planet	53	63	13.0	4.0
SY Dolomite	52	62	12.8	2.4
SY Silhouette	55	62	12.5	2.5
SY Solar	53	63	12.6	3.1
SY Transformer	55	62	12.9	2.8
CRBA164	52	64	12.8	2.3
CRBA173	57	61	11.8	3.1
CRBA180	55	61	13.9	2.6
KSB2209	54	63	13.1	2.4
SY418-250	51	63	12.6	3.4
SY418-336	55	63	13.0	2.4
Mean	53	63	12.8	2.7
LSD (p=0.05)	-	-	-	-

Single trial - no LSD.

The quality data for each region is also presented as a 4-year mean on the individual cultivar description pages.

## Spring Sown Barley - 4-year adjusted mean - relative yield by site

CULTIVAR	Whanganui	Marton*	Southern NI mean	Dunsandel*	Methven*		Pendarves	St Andrews	Canterbury mean	Balfour	Chatton*	Southland mean	Seasons in CPT2 trials
Region	Manawatu	Manawatu		Mid Canterbury	Mid Canterbury		Mid Canterbury	South Canterbury		Northern Southland	Central Southland		(Spring sown)
Dryland/Irrigated	Dryland	Dryland		Irrigated	Irrigated		Irrigated	Dryland		Dryland	Dryland		
No. of trials	4	3	7	3	3		4	4	14	4	3	7	
<b>Buttress</b>	<b>101</b>	96	<b>99</b>	96	101		<b>103</b>	96	99	<b>103</b>	<b>100</b>	<b>101</b>	9
<b>Fortitude</b>	98	99	<b>98</b>	95	99		<b>102</b>	98	98	<b>102</b>	<b>100</b>	<b>101</b>	10
<b>Laureate</b>	<b>101</b>	99	<b>100</b>	<b>103</b>	100		100	100	<b>101</b>	<b>101</b>	<b>103</b>	<b>102</b>	8
<b>Milford</b>	90	95	93	92	92		100	92	94	91	<b>100</b>	96	11
<b>RGT Planet</b>	97	94	96	95	99		92	91	94	97	<b>94</b>	95	10
<b>SY Dolomite</b>	<b>103</b>	<b>104</b>	<b>104</b>	<b>103</b>	100		99	<b>104</b>	<b>101</b>	<b>99</b>	<b>99</b>	<b>99</b>	6
<b>SY Silhouette</b>	<b>102</b>	<b>102</b>	<b>102</b>	<b>103</b>	98		<b>102</b>	103	<b>101</b>	<b>101</b>	<b>104</b>	<b>103</b>	7
<b>SY Solar</b>	<b>102</b>	99	<b>101</b>	99	100		97	95	98	95	<b>97</b>	95	4
<b>SY Transformer</b>	98	<b>102</b>	<b>100</b>	<b>102</b>	102		<b>101</b>	101	<b>102</b>	<b>100</b>	<b>103</b>	<b>102</b>	5
<b>CRBA164</b>	<b>101</b>	<b>101</b>	<b>101</b>	99	101		99	95	99	93	<b>99</b>	96	4
<b>CRBA173</b>	<b>104</b>	99	<b>102</b>	<b>104</b>	<b>107</b>		98	101	<b>103</b>	<b>106</b>	-	<b>105</b>	2
<b>CRBA180</b>	<b>(101)</b>	<b>(104)</b>	<b>(103)</b>	<b>(103)</b>	-		(99)	<b>(109)</b>	<b>(103)</b>	<b>(108)</b>	-	<b>(106)</b>	1
<b>KSB2209</b>	<b>(100)</b>	<b>(102)</b>	<b>(101)</b>	(98)	-		<b>(107)</b>	(101)	<b>(102)</b>	<b>(107)</b>	-	<b>(106)</b>	1
<b>SY418-250</b>	99	98	<b>99</b>	<b>105</b>	101		97	<b>104</b>	<b>101</b>	<b>99</b>	-	<b>98</b>	2
<b>SY418-336</b>	<b>102</b>	<b>106</b>	<b>104</b>	<b>102</b>	100		<b>105</b>	<b>111</b>	<b>104</b>	96	-	95	2
Site mean yield (t/ha)	7.3	7.3	7.3	11.2	10.9		9.5	7.5	9.7	8.3	10.7	9.3	
LSD (estab. cv) (p=0.05)	5	6	7	4	4		6	7	4	9	12	10	
LSD (new vs estab.) (p=0.05)	8	9	10	5	5		9	11	7	15	15	15	

\*No results for Dunsandel (2021-22), Marton (2022-23) and Methven (2023-24) so data are 3-year means. No result from Chatton (2022-23, 2023-24) so data are 2-year means.

- Cultivar has not been in trials at this location.

LSD (estab. cv) is for comparing two "established" cultivars (that have both been in all trials).

LSD (new vs estab.) is for comparing a "new" (first year) cultivar with an "established" cultivar.

Figures in bold indicate the cultivar was amongst the highest yielding group (based on estab. cv LSD).

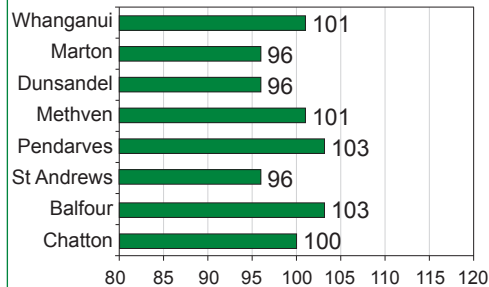
Figures in brackets are less robust as they are only based on one year of data.

## BUTTRESS PVR

YEAR 9

A feed variety with yields ranging from above to below average. Susceptible to scald and leaf rust, but shows resistance to powdery mildew and net blotch. A medium height cultivar with moderate straw strength and intermediate maturity.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Mostly susceptible
Net form of net blotch	Moderately resistant
Leaf rust	Moderately susceptible
Powdery mildew	Mostly resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium-tall
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	55	53	55		
Test weight (kg/hl)	65	66	66		
Protein (%) (N% x 6.25)	11.6	11.4	13.1		
Screenings (%)	1.7	2.2	3.4		

### END USE

Feed

### BACKGROUND

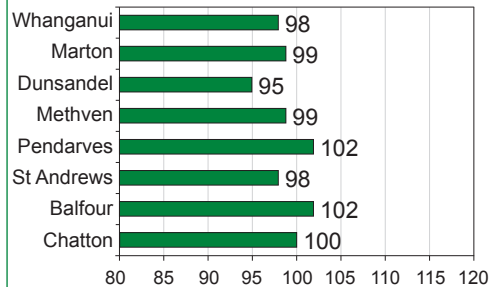
Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

## FORTITUDE PVR

YEAR 10

Above to below average yielding feed variety. Shows resistance to most diseases, with the exception of leaf rust. A medium height cultivar with moderate straw strength and intermediate maturity.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Moderately resistant
Net form of net blotch	Moderately resistant
Leaf rust	Moderately susceptible**
Powdery mildew	Mostly resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	54	52	53		
Test weight (kg/hl)	65	65	66		
Protein (%) (N% x 6.25)	11.9	11.5	13.2		
Screenings (%)	1.6	2.5	2.6		

### END USE

Feed

### BACKGROUND

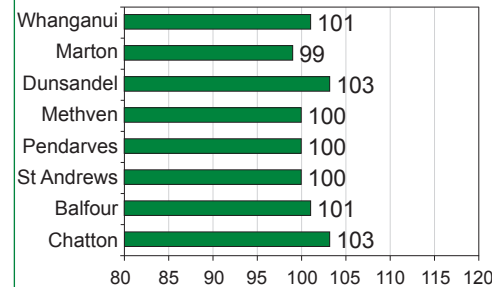
Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

## LAUREATE PVR

YEAR 8

A consistently average to above average yielding feed and malting variety. Moderately susceptible to some leaf rust pathotypes, but shows resistance to other diseases. Cv. Laureate is medium height with a moderate straw strength that requires a robust plant growth regulator programme to capitalise on its high yield potential.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Intermediate resistance
Net form of net blotch	Moderately resistant
Leaf rust	Moderately susceptible**
Powdery mildew	Mostly resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	57	54	57		
Test weight (kg/hl)	62	61	64		
Protein (%) (N% x 6.25)	11.4	11.3	13.0		
Screenings (%)	1.2	3.1	3.0		

### END USE

Malting, feed

### BACKGROUND

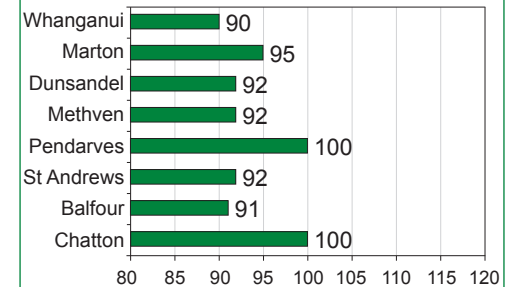
Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

## MILFORD

YEAR 11

A feed cultivar with average to below average yields. Moderately susceptible to net blotch, scald and some leaf rust pathotypes, but mostly resistant to powdery mildew. A stiff, short strawed variety with intermediate maturity.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Moderately susceptible
Net form of net blotch	Moderately susceptible
Leaf rust	Moderately susceptible**
Powdery mildew	Mostly resistant

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	54	50	52		
Test weight (kg/hl)	63	62	63		
Protein (%) (N% x 6.25)	11.4	11.3	12.8		
Screenings (%)	3.2	5.9	7.4		

### END USE

Feed

### BACKGROUND

Breeder	Breun, Germany
Head Licensee	Carrfields Grain & Seed
Agent	Carrfields Grain & Seed

Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

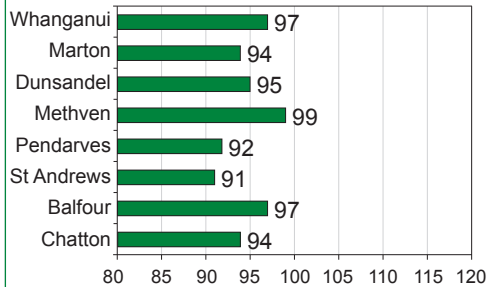


## RGT PLANET<sup>PVR</sup>

YEAR 10

A malting and feed cultivar producing mostly below average yields when sown in spring. Shows resistance to scald and powdery mildew, but moderately susceptible to net blotch and leaf rust. Medium height with moderate straw strength.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Moderately resistant
Net form of net blotch	Moderately susceptible
Leaf rust	Moderately susceptible
Powdery mildew	Mostly resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	58	53	56		
Test weight (kg/hl)	64	63	64		
Protein (%) (N% x 6.25)	11.3	11.2	12.8		
Screenings (%)	1.6	3.5	3.8		

### END USE

Malting, feed

### BACKGROUND

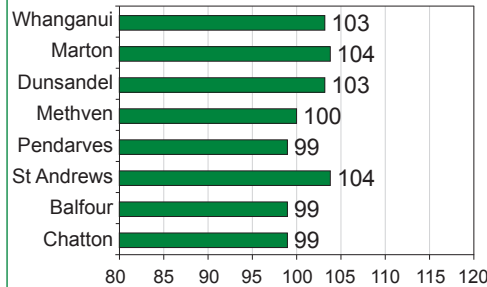
Breeder	RAGT
Head Licensee	RAGT New Zealand
Agent	PGG Wrightson Grain

## SY DOLOMITE<sup>PVR</sup>

YEAR 6

Average to above average yielding feed variety. Performs well in the southern North Island. Has varying levels of resistance to most diseases, but is moderately susceptible to leaf rust. A medium height variety with moderate to stiff straw strength.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Intermediate resistance
Net form of net blotch	Intermediate resistance
Leaf rust	Moderately susceptible
Powdery mildew	Resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	59	55	55		
Test weight (kg/hl)	62	61	63		
Protein (%) (N% x 6.25)	11.2	11.1	12.8		
Screenings (%)	1.3	3.6	3.5		

### END USE

Feed

### BACKGROUND

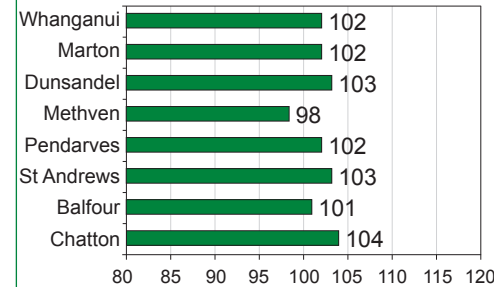
Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Wholesale Seeds

## SY SILHOUETTE<sup>PVR</sup>

YEAR 7

Mostly average to above average yielding feed variety. Consistent performer across irrigated and dryland sites. Shows resistance to most diseases with the exception of leaf rust. A late maturing, medium height variety with a stiff straw.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Intermediate resistance
Net form of net blotch	Moderately resistant
Leaf rust	Moderately susceptible
Powdery mildew	Resistant

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Late

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	57	54	57		
Test weight (kg/hl)	61	61	63		
Protein (%) (N% x 6.25)	11.2	11.0	12.6		
Screenings (%)	1.6	3.7	3.3		

### END USE

Feed

### BACKGROUND

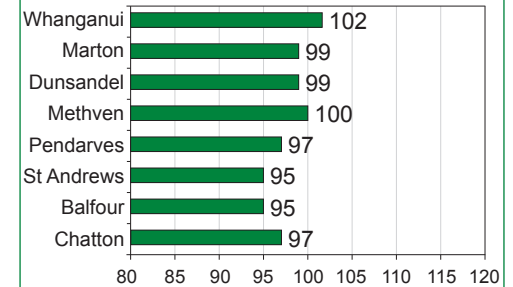
Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Cates, Advance Agriculture

## SY SOLAR

YEAR 4

A feed variety with malting potential, producing mostly average to below average yields. Good performer in southern North Island. Monitor for scald and leaf rust. A medium height cultivar with a stiff straw and early to intermediate maturity.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Susceptible
Net form of net blotch	Intermediate resistance
Leaf rust	Mostly susceptible
Powdery mildew	Resistant

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Early-intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	59	55	56		
Test weight (kg/hl)	64	62	64		
Protein (%) (N% x 6.25)	11.5	10.9	12.6		
Screenings (%)	1.4	3.0	4.6		

### END USE

Feed, malting potential

### BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

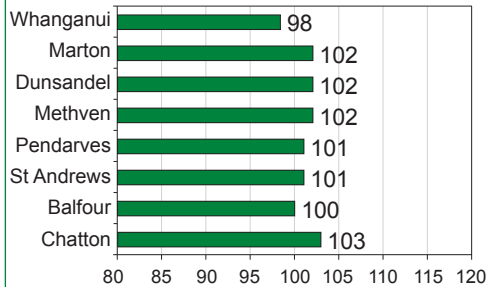
Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

## SY TRANSFORMER<sup>PVR</sup> YEAR 5

Mostly average to above average yielding feed variety producing fairly consistent yields across all sites tested. Has varying levels of resistance to the most common diseases, but is moderately susceptible to leaf rust. Medium height with moderate to stiff straw strength and intermediate maturity.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Intermediate resistance
Net form of net blotch	Moderately resistant
Leaf rust	Moderately susceptible
Powdery mildew	Resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	57	55	57		
Test weight (kg/hl)	62	62	63		
Protein (%) (N% x 6.25)	11.4	11.2	12.4		
Screenings (%)	1.3	3.0	3.6		

### END USE

Feed, malting potential

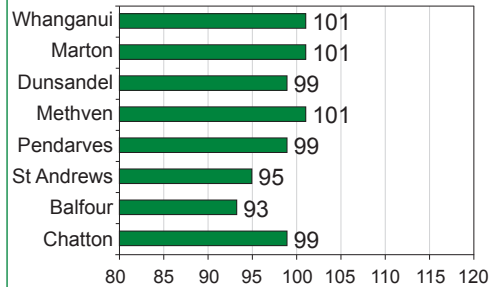
### BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

## CRBA164 YEAR 4

DISCONTINUED

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Susceptible
Net form of net blotch	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	57	54	56		
Test weight (kg/hl)	61	62	62		
Protein (%) (N% x 6.25)	11.2	11.0	13.2		
Screenings (%)	1.0	2.6	4.3		

### END USE

Feed

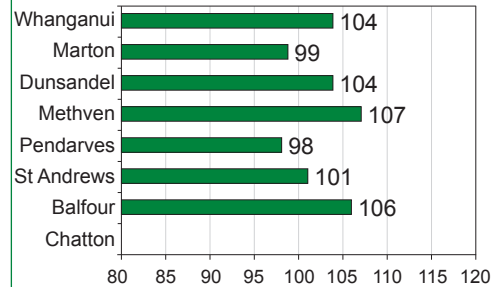
### BACKGROUND

Breeder	
Head Licensee	
Agent	

## CRBA173 YEAR 2

A mostly average to high yielding feed cultivar. Shows resistance to the most common barley diseases. A medium height cultivar with moderate straw strength and early to intermediate maturity.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Intermediate resistance
Net form of net blotch	Intermediate resistance
Leaf rust	Intermediate resistance
Powdery mildew	Moderately resistant

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	57	55	60		
Test weight (kg/hl)	60	60	61		
Protein (%) (N% x 6.25)	10.9	10.6	11.7		
Screenings (%)	2.0	3.1	3.3		

### END USE

Feed

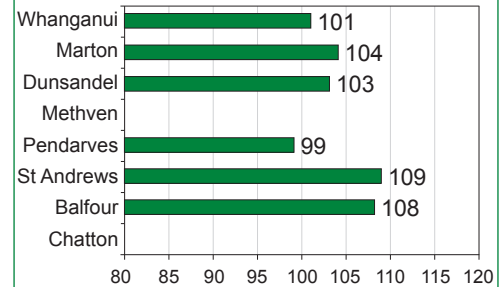
### BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

## CRBA180 YEAR 1

An average to high yielding feed cultivar in its first year of CPT 2 trials. Moderately susceptible to leaf rust. A medium height cultivar with moderate straw strength and intermediate maturity.

### RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Moderately resistant
Net form of net blotch	Intermediate resistance
Leaf rust	Moderately susceptible
Powdery mildew	Unknown

### FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	58	56	59		
Test weight (kg/hl)	60	60	62		
Protein (%) (N% x 6.25)	11.1	11.2	13.8		
Screenings (%)	1.7	2.6	3.8		

### END USE

Feed

### BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

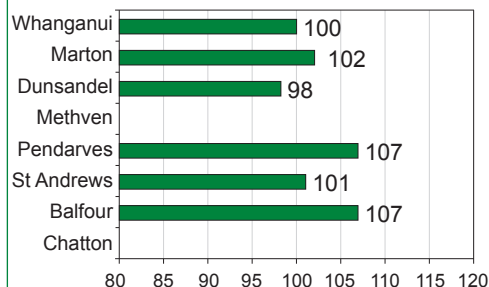
Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

## KSB2209

YEAR 1

DISCONTINUED

RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Moderately resistant
Net form of net blotch	Intermediate resistance
Leaf rust	Intermediate resistance
Powdery mildew	Unknown

### FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	58	56	57		
Test weight (kg/hl)	62	61	63		
Protein (%) (N% x 6.25)	11.2	11.4	13.0		
Screenings (%)	1.8	2.2	3.6		

END USE Feed

### BACKGROUND

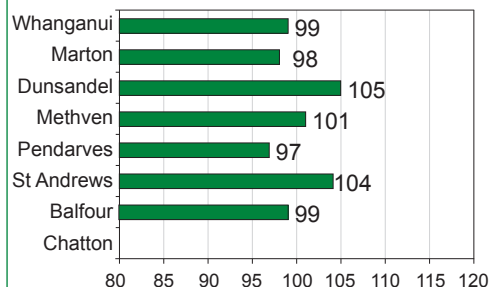
Breeder	
Head Licensee	
Agent	

## SYN418-250

YEAR 2

A feed variety with yields ranging from below average to high. Shows resistance to scald and net blotch, but is mostly susceptible to leaf rust. A medium height cultivar with moderate to stiff straw strength and intermediate maturity.

RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Moderately resistant
Net form of net blotch	Intermediate resistance
Leaf rust	Mostly susceptible
Powdery mildew	Unknown

### FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	56	54	54		
Test weight (kg/hl)	62	62	63		
Protein (%) (N% x 6.25)	10.8	10.6	12.3		
Screenings (%)	1.6	2.6	3.6		

END USE Feed

### BACKGROUND

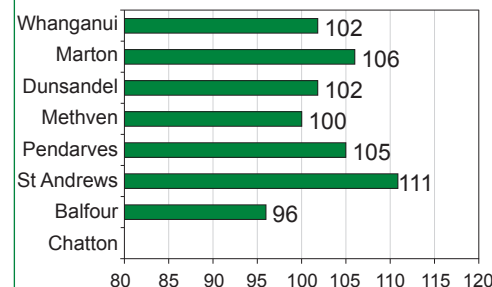
Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

## SYN418-336

YEAR 2

A feed variety with malting potential, with yields ranging from below average to high. Moderately susceptible to leaf rust but shows resistance to other barley diseases. A short to medium height cultivar with stiff straw strength and intermediate maturity.

RELATIVE YIELDS – 4-year\* adjusted mean (% of site mean yield)



### DISEASE RESISTANCE

Scald	Moderately resistant
Net form of net blotch	Intermediate resistance
Leaf rust	Moderately susceptible
Powdery mildew	Unknown

### FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short-medium
Maturity	Intermediate

### GRAIN QUALITY (4-year means)

	Sth	Nth	Is	Cant	Sthld
TGW (g)	57	55	57		
Test weight (kg/hl)	60	62	63		
Protein (%) (N% x 6.25)	11.4	11.0	12.8		
Screenings (%)	1.7	3.2	3.2		

END USE Feed, malting potential

### BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

Sth Nth Is (Southern North Island), Cant (Canterbury), Sthld (Southland). \*No results for Marton (2022-23) and Dunsandel (2021-22) so data are 3-year means. Chatton is a 2-year mean (no data from 2022-23 and 2023-24). \*\* Resistance is affected by pathotypes present (score is an average).

## Spring sown wheat and barley

These guidelines have been constructed from FAR sowing date trial data combined with agronomic experience and in the case of some new cultivars, UK information is also used.

'Optimal' sowing dates – ■ 'Less ideal' sowing dates – ■

WHEAT	JULY	AUGUST	SEPTEMBER	OCTOBER
Cochise	■	■	■	■
Raffles	■	■	■	■
Sensas	■	■	■	■
Discovery	■	■	■	■
Conquest	■	■	■	■
Reliance	■	■	■	■
CRWT278	■	■	■	■
Viceroy	■	■	■	■

BARLEY	JULY	AUGUST	SEPTEMBER	OCTOBER
Buttress	■	■	■	■
CRBA173	■	■	■	■
Fortitude	■	■	■	■
Laureate	■	■	■	■
SY Dolomite	■	■	■	■
SY Solar	■	■	■	■
SY Transformer	■	■	■	■
SYN418-250	■	■	■	■
SYN418-336	■	■	■	■
RGT Planet	■	■	■	■
SY Silhouette	■	■	■	■
Milford	■	■	■	■
CRBA180	■	■	■	■

Less information available for new cultivars.  
Crops sown at the early window could be at risk from late frosts during flowering and grainfill.  
Barley cultivars at the late sowing window are more suited to irrigated, higher fertility sites.

This calculation uses several variables to give an accurate answer for suggested sowing rates.

To use the calculation, you will need to know the following:

- the plant population you want to establish for your crop,
- the thousand grain weight (TGW) of the seed,
- the germination rate (%) of the seed,
- the expected crop emergence, calculated by time of sowing, seed quality and management factors (e.g. seed treatment, sowing depth, seed-bed quality).

The steps to follow are:

### THOUSAND GRAIN WEIGHT

If using certified seed, the value for TGW should be available on the seed bag or on request. If you need to calculate it yourself, the number of seeds you will need to count will depend on the accuracy of your scales. Make sure your seed sample is representative of the whole line.

- If you have scales that will weigh to 0.1 g, count 200 seeds, weigh them and multiply the weight by five to get 1000 seed weight.
- If not, count and weigh 1000 seeds.

### GERMINATION RATE (%)

This should also be on the bag label or available on request. A purity and germination (P&G) test figure is usually quoted. Germination tests determine the maximum germination potential of a given seed line. Some caution is advised as the germination figure does not always equate to the percentage of seeds expected to emerge in the field. This can be due to conditions in the field as well as the physiological quality of a particular seed line and its tolerance to stress.

### EMERGENCE RATE (%)

Emergence rate is an estimate based on actual emergence in the field. Further information can be gained from 'stress tests' and 'vigour tests'. These test results are not usually available, but can be requested. Experience certainly helps when deciding on this figure.

Examples of emergence %:

- June sown: 80% emergence.
- July sown: 75% emergence (assumes may be a poorer quality seedbed, sown too deep, cold soil conditions).
- August – October sown: 80-90% emergence (assumes soil moisture availability and increasing soil temperatures).

$$\text{SOWING RATE} = \frac{\text{target plant population (p/m}^2\text{)} \times \text{TGW (g)} \times 100}{(\text{kg/ha}) \times \% \text{ germination rate} \times \% \text{ emergence rate}}$$

Examples:

### SPRING WHEAT

- A wheat sample TGW = 45 g
- B germination rate = 90%
- C emergence rate = 90%
- D target plant population = 250 pl/m<sup>2</sup>
- E required sowing rate is 139 kg/ha

### SPRING BARLEY

- A barley sample TGW = 40 g
- B germination rate = 90%
- C emergence rate = 85%
- D target plant population = 225 pl/m<sup>2</sup>
- E required sowing rate is 118 kg/ha

The calculation can be transformed to determine the actual emergence rate achieved (useful if poor establishment):

$$\text{EMERGENCE} = \frac{\text{actual plant population (p/m}^2\text{)}}{(\%) \times \frac{\text{sowing rate (kg/ha)} \times \% \text{ germination}}{\text{TGW (g)} \times 100}}$$

The actual plant population needs to be counted in the field (rod or quadrat methods) for the above calculation, whilst TGW, sowing rate and germination rate are figures that were known at drilling.

### ISSUES FOR SUCCESSFUL ESTABLISHMENT

**MOISTURE:** Moisture is essential for seed germination. Once germinated, the young seedling is also very fragile and may dry out rapidly if there is insufficient moisture in the root zone. Too much moisture (waterlogging) will mean oxygen starvation, which will lead to germination failure or seedling death.

**NUTRITION:** Plant roots follow the easiest path for growth, so nutrition should be placed near the roots. Some fertilisers will, however, “burn” seedlings, so they must be placed out of direct contact with the seed.

**SEEDBED:** A trashy seedbed may reduce seed/soil contact, thereby reducing germination, while a compacted seedbed may restrict emergence. A seedbed with large clods may also force emerging seedlings to become deformed (and therefore weakened) in their attempt to emerge.

**SOWING DEPTH:** When sown too shallow, seed may be subject to bird damage and susceptible to drying out. If seed is sown too deep, young plants will struggle to emerge; they may be weak and therefore prone to disease or deformity. Check that your drill is placing seed at the optimum depth. This is also important when considering residual herbicides since some products require a minimum planting depth.

**WEEDS, DISEASES AND PESTS:** Weeds will compete with the crop for light, moisture and nutrients. Weeds may be more of a problem in thinly sown (or poorly established) crops. The main disease problem for emerging seedlings is fungi affecting the new roots. These are more likely to occur in a cool, damp environment, when seedlings are less vigorous and therefore more prone to attack. Seed treatment with fungicides may be beneficial if seed-borne diseases are a concern, but these treatments may also delay crop emergence. A wide range of pests can cause problems - slugs, weevils, grass grubs, etc. If these are present, control options need to be evaluated.

### ESTABLISHMENT TARGETS FOR WINTER/SPRING SOWINGS

- June 200 plants/m<sup>2</sup>
- July 200 plants/m<sup>2</sup>
- August 200 plants/m<sup>2</sup>
- September 250 plants/m<sup>2</sup>
- October 300 plants/m<sup>2</sup>

Use sowing rate calculation on previous page to achieve your establishment target.

### SEED QUALITY

High quality seed has:

- 90% germination or higher
- less than 10% *Fusarium/Microdochium*
- a thousand seed weight (TSW) of 40g or more

Table: Attributes of example seed lots.

Seed lot	Germination <sup>1</sup> (%)	Abnormal <sup>2</sup> seedlings (%)	Remainder <sup>3</sup> (%)	<i>Fusarium</i> <sup>4</sup> (%)
A	98	1	1	3
B	80	14	6	14
C	91	7	2	4

<sup>1</sup> Percentage of normal seedlings (no defects) reported from the germination test.

<sup>2</sup> Percentage of abnormal seedlings (defects such as twisted shoots or stunted roots; such seedlings will not usually emerge).

<sup>3</sup> Seeds which have not germinated, either because they are dormant, or more commonly, dead.

<sup>4</sup> Seed-borne plant pathogen present after fungicide seed treatment.

Note:

Seed lot A – high quality seed lot.

Seed lot B – reject because of poor germination; the presence of abnormal seedlings and dead seeds indicates the seed lot has undergone physiological deterioration and will struggle to perform once sown; *Fusarium* level may also contribute to emergence problems.

Seed lot C – germination acceptable but some evidence of deterioration.

### PATHOGEN THRESHOLDS

- European (UK, Denmark) guidelines suggest that if less than 10% *Fusarium/Microdochium* or 5% *Drechslera* infection, untreated seed can be sown in early autumn or late spring, however no New Zealand thresholds have been established.
- Seed-borne pathogen data for New Zealand cereal seed lots usually not available.
- Advisable to sow fungicide treated seed at all times because of the risk from soil-borne *Fusarium*.
- A zero threshold exists for loose smut and seed-borne barley stripe mosaic virus. Seed lines with loose smut will be rejected from certification and uncertified seed must be treated.

Seed quality details will be freely available from a reputable seed merchant upon request.

### SPRING WHEAT AND BARLEY SEED TREATMENT STRATEGIES

#### FUNGICIDES

1. Consider using Kinto® Duo, Raxil® Star, Rancona® Dimension or Vitaflo® for protection from soil or seed-borne *Fusarium*.
2. Consider using Systiva® for protection from rusts and powdery mildew.
3. All of the products above plus Capri® provide control of loose smut and bunt.

#### INSECTICIDES

Products based on imidacloprid (e.g. Gaucho®) and clothianidin (e.g. Poncho®) are the only registered insecticide seed treatments providing some control of aphids, grass grub larvae and Argentine stem weevil. They should provide control of aphids up until the plant reaches GS13, or as the first tiller is appearing. At this time, the plant has grown enough that a dilution effect occurs.

### CONSIDERATIONS FOR INSECTICIDE SEED TREATMENT IN SPRING CROPS:

- Insecticide seed treatments can be used for grass grub control, but will be less effective on aphids, as seedling growth occurs too rapidly, increasing the rate of product breakdown. The need for a foliar aphicide should be monitored after GS12/13.
- Growers should consider the economics of insecticide seed treatment versus foliar insecticides if aphid pressure, only, is high; especially if the seed is sown early and further foliar aphicide applications may be necessary.
- Insecticide seed treatments are likely to be most useful when both grass grub and early aphid protection are needed, when spraying is difficult or inconvenient, or to provide management flexibility.

Note: Any chemical (fungicide or insecticide) has the potential to reduce germination and/or establishment if applied to a physically damaged seed (e.g. seed coat cracked). Cracking may allow the chemical access to the embryo; either killing the seed or resulting in abnormal seedlings.

<b>4-year adjusted mean</b>	A “4-year adjusted mean” is a mean over trials in the last 4 years. This mean has been adjusted statistically to take account of the absence of some cultivars in some trials (for example, if a cultivar was missing from an especially high yielding trial, it would otherwise be unfairly disadvantaged). This adjustment enables fair comparisons between cultivars within each site and region.
<b>CPT</b>	Cereal performance trials (CPT) comprise of two stages, administered jointly through a single management committee. CPT 1: Pre-commercial. Assesses performance of advanced breeding lines within a series of collaborative breeder/seed company operated trials. Stage 1 trials only operate in Canterbury. CPT 2: Focus on performance of close to market pre-commercial and commercial cultivars. Milling and malting cultivars must do a minimum of 2 years in CPT 1 and feed cultivars a minimum of one year in CPT 1 before being eligible for promotion into CPT 2.
<b>CV%</b>	The “Coefficient of Variation”, or CV (%), is another measure of the variability in a trial. If the differences between cultivars are similar across all replicates, the trial CV is low (<10%) and the LSD is low (both desirable). If the trial CV is high (>10%), there is a high level of unexplained variation, and the trial results are less accurate.
<b>Falling number</b>	Low falling number scores are an indicator of sprouting. Falling number (FN) is an indirect measure of alpha-amylase levels in the grain with low FN indicating high alpha-amylase activity. FN is tested three weeks after harvest and only on milling wheats.
<b>Limited data</b>	For newer cultivars that we have only evaluated for one or two years, we may not have sufficient disease or agronomic observations to feel confident about the data presented. In this case the data is given in brackets ( ).
<b>LSD</b>	The “Least Significant Difference” is used to compare the mean yields of two cultivars. The difference in yield between two cultivars must be greater than the LSD for those two cultivars to be proven different (statistically at P=0.05). For example, if the LSD is 0.8, a difference between two cultivars of 0.5 is not ‘proven’, while a difference of 1.2 is proven. Any cultivar falling within one LSD of the highest yielding cultivar has been highlighted in the yield tables as part of the highest yielding group. Note that some cultivars with the same yield may not appear in the top yielding group due to rounding figures to zero or one decimal place.
<b>Protein %</b>	The protein content is obtained by measuring the nitrogen (N) content and using a conversion factor to calculate the protein (%). The conversion factors in this booklet are N x 5.7 for all wheat and N x 6.25 for all barley. Some feed wheat users choose to use N x 6.25. To convert the wheat protein from 5.7 to 6.25 use a conversion factor of 1.096 x protein (%).





FAR would like to name and thank the people who have helped contribute to the timely production of this booklet:

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**FINANCIAL CONTRIBUTORS:**

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