



ADDING VALUE TO THE BUSINESS OF CROPPING

PO Box 23133
Templeton
Christchurch 8445
New Zealand

Tel: 03 345 5783
Fax: 03 341 7061
Email: far@far.org.nz
www.far.org.nz

FAR Cultivar Evaluation
ISSN 2324-139X (Print)
ISSN 2324-1403 (Online)

FAR CULTIVAR EVALUATION



FOUNDATION FOR ARABLE RESEARCH



**autumn sown
wheat and barley
2016/2017**

page

introduction and welcome

3

AUTUMN SOWN WHEAT

2016/2017 trial site location map

4

2016/2017 trial site details

4

agronomic comment

8

cultivar evaluation - 2016/2017 season:

– yields (t/ha) – feed cultivars

10

– yields (t/ha) – milling cultivars

13

– grain quality data – by region

14

cultivar evaluation – 4 year adjusted mean - relative yield by site

18

plant population

22

cultivar descriptions

23

AUTUMN SOWN BARLEY

2016/2017 trial site location map

35

2016/2017 trial site details

35

agronomic comment

36

cultivar evaluation - 2016/2017 season:

– yields (t/ha)

37

– grain quality data – by region

38

cultivar evaluation – 4 year adjusted mean - relative yield by site

39

cultivar descriptions

40

sowing date guidelines

48

sowing rate calculation

49

seed quality and seed treatments

51

glossary of terms

53

paddock sowing record

54

acknowledgements

55

Disease ratings are a very important component of deciding which cultivar to grow. Cultivar disease resistance ratings are based on a combination of scores from disease nurseries, CPT2 trials, and previous season's scores. Both autumn and spring disease nurseries are planted at Lincoln while there is a spring only nursery at Plant & Food Research, Palmerston North. A cultivar or mix of cultivars which are very susceptible to the disease in question are sown evenly throughout each nursery for stripe rust, leaf rust and powdery mildew. In the case of *Septoria tritici* blotch, infected stubble is also spread throughout the nursery. Assessments are carried out in some of the CPT2 trials, especially in trials where fungicides have not been applied on one replicate.

Each cultivar is then given a rating for resistance to each disease: R (resistant); MRR (mostly resistant); MR (moderately resistant); MS (moderately susceptible); MSS (mostly susceptible); S (susceptible). Where resistance varies according to the presence of particular races of the pathogen, an average is given and this is indicated with an asterisk on the rating.

Some diseases are more difficult to rate. For example *Fusarium* head blight (FHB) scores are highly variable from site to site and season to season, as the primary time for infection is flowering, and the symptoms are most apparent 15 to 20 days later. Therefore, both the maturity of a cultivar and the rainfall patterns around flowering need to be taken into consideration when assessing susceptibility. Typically, FHB nurseries favour later maturing lines which appear more resistant because their flowering coincides with drier weather. This season a specific trial was run at Palmerston North. The trial was infected with maize straw to encourage infection by FHB. Regular rainfall over flowering gave perfect conditions for infection resulting in a successful trial. This trial will be repeated this season to strengthen the FHB ratings.

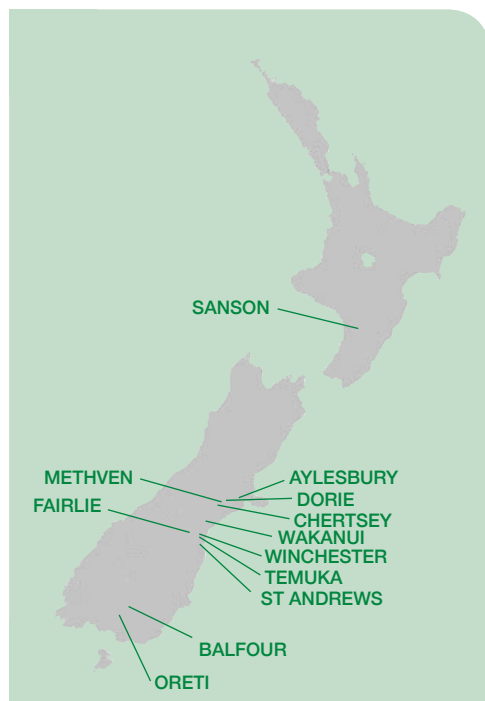
FAR welcomes any queries or suggestions to further improve these booklets. Alternatively, if you require any additional information that we have not included please contact us.

Rob Craigie
Research Manager

This publication is copyright to the Foundation for Arable Research ("FAR") and may not be reproduced or copied in any form whatsoever without FAR's written permission.

This publication is intended to provide accurate and adequate information relating to the subject matters contained in it and is based on information current at the time of publication. Information contained in this publication is general in nature and not intended as a substitute for specific professional advice on any matter and should not be relied upon for that purpose. No endorsement of named products is intended nor is any criticism of other alternative, but unnamed products.

It has been prepared and made available to all persons and entities strictly on the basis that FAR, its researchers and authors are fully excluded from any liability for damages arising out of any reliance in part or in full upon any of the information for any purpose.



2016/2017 trial site location map

AYLESBURY (Milling Wheat)

Lismore silt loam, Irrigated
Trial operator: John van den Bosch
Host farmer: Andrew Brooker

Following ryegrass, this trial was sown on 16 June 2016 into a surrounding crop of Conquest. The trial received 207 kg N/ha, three herbicides and one insecticide application. Three fungicide applications and a PGR were also applied during the growing season. A total of 120 mm irrigation was applied over three applications. Establishment was slow but the trial recovered well and was harvested on 14 February 2017 with some minor shattering noted.

BALFOUR (Feed Wheat)

Crookston silt loam, Dryland
Trial operator: Stewart Armstrong
Host farmer: Craig Collins

This site was established in a surrounding crop of Starfire on 6 April 2016 following peas. A total of 307 kg N/ha was applied. The trial received two herbicide applications, a PGR and four fungicides. The trial established well with no issues and was harvested over two days on 22 and 24 February 2017.

CHERTSEY (Feed Wheat)

Chertsey shallow silt loam, Dryland and Irrigated
Trial operator: NZ Arable
Host farmer: FAR Arable Site

These trials were drilled at the FAR Arable Site on 14 April following grass. Each trial received a total of 241 kg N/ha over three timings. The trials received three herbicide and three fungicide applications. A PGR mix and three foliar applications of insecticide were made during the season. The irrigated trial received 245 mm of water applied over eight passes. The dryland trial was harvested on 27 January. Some minor shattering was noted when the irrigated trial was harvested on 3 February 2017.

DORIE (Milling Wheat)

Eyre silt loam, Irrigated
Trial operator: Andy Hay
Host farmer: Geoff Maw

This trial was sown on 5 May 2016 into a surrounding crop of Reliance, following potatoes. A total of 253 kg N/ha was applied split between three applications. The trial received two herbicide applications, two foliar insecticides and a PGR. Three fungicides were applied between August and December. The trial received 80 mm irrigation applied over two applications. The trial was harvested on 31 January 2017.

FAIRLIE (Feed Wheat)

Claremont silt loam, Dryland
Trial operator: NZ Arable
Host farmer: Ashley Biggs

This site was sown in a surrounding crop of wheat on 5 April 2016 following peas. A total of 212 kg N/ha was applied in three split applications. The trial received one foliar insecticide, one herbicide and four fungicide applications. A PGR was applied in September. The trial was harvested on 15 February 2017.

METHVEN (Milling Wheat)

Lyndhurst silt loam, Irrigated
Trial operator: John van den Bosch
Host farmer: Bevan and Graeme Lill

This trial was sown in a paddock of Duchess following radish on 27 April 2016. Crop 15 was applied to the trial followed by four fertiliser applications totalling 267 kg N/ha. Four herbicide and six fungicide applications were made during the growing season. The trial also received a PGR spray, slug bait and four foliar insecticides. Irrigation totalling 100 mm was applied over four applications. The trial established well and was harvested on 21 February 2017.

METHVEN (Feed Wheat)

Mayfield silt loam, Irrigated
Trial operator: Paul Bowater
Host farmer: David Grant

The trial was sown in a crop of Starfire on 6 April 2016 following radish. 276 kg N/ha was applied between four applications. The trial received four herbicides, five foliar insecticides and three applications of fungicide during the season. A PGR mix was applied mid-September. Irrigation totalling 135 mm was applied in nine applications, beginning in October. The trial was harvested on 16 February 2017.

ORETI (Feed Wheat)

Drummond loam, Dryland
Trial operator: Stewart Armstrong
Host farmer: Robbie Clark

This feed wheat trial was sown on 6 April 2016 into a surrounding crop of Starfire following oilseed rape. 138 kg N/ha was applied, split between two applications. The trial received three herbicide and four fungicide applications. A PGR was also applied. The trial was harvested on 16 March 2017.

SANSON (Feed Wheat)

Ohakea silt loam, Dryland
Trial operator: Kevin Sinclair
Host farmer: Douglas Giles

This site was sown on 18 April 2016 in a surrounding crop of Torch following garden peas. A total of 196 kg N/ha was applied in three split applications during the growing season. The trial received three herbicides, two foliar insecticides, four fungicides and one PGR application. The crop suffered from damp conditions during mid-winter and spring followed by BYDV and Septoria. Lodging was noted in the trial prior to harvest. Harvest occurred over two days; 29 and 31 January 2017.

ST ANDREWS (Feed Wheat)

Claremont clay loam, Dryland
Trial operator: Andy Hay
Host farmer: Nick Porter

This dryland trial was established in a crop of Starfire following a clover crop on 3 April 2016. A total of 180 kg N/ha was applied in three split applications. The trial received four fungicide and two insecticide applications. A PGR was also applied. The trial was harvested on 2 February 2017.

TEMUKA (March and April Feed Wheat)

Waimakariri silt loam, Irrigated

Trial operator: Matt Hicks

Host farmer: Nick Ward

The March (3 March 2016) and April (18 April 2016) trials were sown into a surrounding crop of Starfire, following pasja. Both trials received 246 kg N/ha, two herbicide applications and two PGRs. Three insecticide applications were made to the March sown trial, and two to the April sown trial. The trials also received five applications of fungicide and 125 mm of irrigation. Both trials were harvested on 21 February 2017.

WAKANUI (Feed Wheat)

Wakanui silt loam, Irrigated

Trial operator: John van den Bosch

Host farmer: Eric Watson

This trial was sown on 18 April 2016 into a surrounding crop of Inferno, following pak choi. Three applications of N totalling 262 kg/ha were applied during spring. The trial received three herbicide, four fungicide and four foliar insecticide applications. Two PGRs were also applied. Irrigation totalling 90 mm was applied over three applications. The trial was harvested on 22 February 2017.

WINCHESTER (Milling Wheat)

Temuka silt loam, Irrigated

Trial operator: Andy Hay

Host farmer: Murray Turley

This Winchester site is new for the 2016/17 season, replacing the Wakanui site from previous seasons. The trial was sown on 10 May 2016 into a surrounding cultivar of Mulika wheat, following carrots. Four applications of N totalling 267 kg/ha and two liquid applications of 40 l/ha were applied. The trial received four herbicide and foliar insecticide applications. Five fungicides and two PGRs were also applied. Irrigation totalling 41 mm was applied over two applications. The trial was harvested on 15 February 2017.

Autumn Sown Wheat Agronomic Comment 2016/2017 Season

CULTIVAR	Years in FAR trials	Septoria tritici blotch	Stripe rust	Leaf rust	Powdery mildew			Fusarium head blight ¹	Straw strength	Crop height	Maturity	Sprouting susceptibility
Claire	17	MS	MSS*	MR	MS*			MS	Moderate	Medium	Late	Moderate-high
Conqueror	3	MS	MR	S	(MR)			(MS)	Stiff	Medium	Intermediate	Low-moderate
Conquest	12	MRMS	MR	MSS*	MS			MS	Moderate-stiff	Medium	Early-int	Low
Discovery (KWM31)	4	MR	MRMS	MRR	MRR			(MSS)	Stiff	Tall	Intermediate	Low-moderate
Duchess	3	MRMS	MRMS	MS	MS			(MRMS)	Stiff	Medium	Intermediate	Low
Empress	7	MRR	MRR	MRMS*	MRMS			(MR)	Stiff	Medium	Intermediate	Low-moderate
Excede	11	MSS	MR	MRMS	MR			MR	Stiff	Short	Intermediate	Low
Gator	4	MS	MR	MSS	MRR			(MR)	Stiff	Short	Intermediate	Low
Graham (CM159)	1	(MR)	(MRR)	(MR)	(MR)			(MRR)	Stiff	Medium	Early	Low
Hanson (CRWT204)	3	MRMS	MR	MRMS	MS			(S)	Stiff	Medium-tall	Intermediate	Low-moderate
Ignite (KWW59)	2	MR	MR	MS	(MRMS)			(MRR)	Stiff	Medium	Late	Low-moderate
Inferno (KWW47)	5	MRR	MS*	(MR)	MRR			(MRMS)	Moderate	Medium-tall	Late	Low-moderate
Raffles	13	MR	MSS	MSS	MR			(MSS)	Moderate	Tall	Intermediate	Low
Reflection (SY111978)	1	(MR)	(MRMS)	(MR)	(MR)			(MR)	Stiff	Short	Early	Low-moderate
Reliance	5	MS	MR	MSS	MS			MS	Moderate-stiff	Short-medium	Early-int	Low
Ruapuna (CRWT227)	2	MS	MR	MS	(MR)			(MRR)	Stiff	Medium	Late	Low-moderate
Saracen	9	MR	MR	MSS	MR			(MSS)	Stiff	Short	Intermediate	Low
Starfire (KWW46)	6	MRMS*	MR	MS	MR			(MR)	Stiff	Medium	Intermediate	Moderate
Torch	4	MRMS*	MRR	MS*	MR			(MRMS)	Stiff	Medium	Late	Low
Viceroy	7	MS	MR	MS	MS			MSS	Stiff	Medium-tall	Intermediate	Low-moderate
Wakanui	9	MR	MRR	MRMS	MS			(MRMS)	Stiff	Tall	Late	Moderate
CRWT218	2	MS	MR	MS	MSS			(MR)	Stiff	Tall	Intermediate	Low-moderate
CRWT233	1	(MRMS)	(MRR)	(MRR)	(MR)			(MR)	Moderate	Medium-tall	Intermediate	Low

¹ Fusarium head blight ratings are indicative only (one year of data).

Scores followed by * indicate resistance is affected by pathotypes present (score is an average). (brackets) indicate there is limited NZ trial data to assess resistance.

“Unknown” indicates there is insufficient trial information in NZ to assess resistance.

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

Sprouting susceptibility comments are sourced from FAR funded Sprouting Nurseries 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

wheat - 2016/2017 yield (t/ha)

CULTIVAR	Methven	Chertsey Dryland	Chertsey Irrigated	Wakanui	Temuka	St Andrews	Fairlie	Cant. mean yield	Seasons in FAR trials (Autumn sown)
Region	Mid Cant	Mid Cant	Mid Cant	Mid Cant	Mid Cant	South Cant	South Cant		
Soil type	Mayfield stony silt loam	Chertsey shallow silt loam	Chertsey shallow silt loam	Wakanui silt loam	Waimakariri sandy loam	Claremont clay loam	Claremont silt loam		
Previous crop	Radish	Grass	Grass	Pak Choi	Pasja	Clover	Peas		
Sow date	6 Apr	14 Apr	14 Apr	18 Apr	18 Apr	3 Apr	5 Apr		
Harvest date	16 Feb	27 Jan	3 Feb	22 Feb	21 Feb	2 Feb	15 Feb		
Dryland/Irrigated	Irrigated	Dryland	Irrigated	Irrigated	Irrigated	Dryland	Dryland		
Claire	15.8	10.2	12.9	12.8	12.7	11.7	14.0	12.9	17
Conqueror	16.3	10.9	13.3	11.3	12.6	12.0	15.3	13.1	3
Empress	15.5	10.9	12.8	11.5	11.6	12.5	14.5	12.8	7
Excede	16.0	10.8	12.4	10.5	11.5	10.6	13.9	12.2	11
Gator	16.0	10.4	13.1	13.2	12.1	11.3	14.3	12.9	4
Graham (CM159)	17.5	11.3	13.9	14.2	12.9	12.8	14.9	13.9	1
Ignite (KWW59)	16.7	11.3	13.7	13.3	13.5	12.8	14.6	13.7	1
Inferno	16.2	10.6	13.1	13.5	11.7	12.6	14.2	13.2	5
Reflection (SY111978)	16.6	10.7	13.6	13.5	13.2	12.2	14.2	13.4	1
Ruapuna (CRWT227)	16.2	11.1	13.6	12.5	12.1	12.8	14.2	13.2	2
Starfire	16.7	10.2	13.0	11.7	12.0	11.6	15.1	12.9	6
Torch	16.2	10.6	13.5	12.1	12.6	12.6	14.3	13.1	4
Wakanui	16.8	10.3	13.1	13.5	12.0	12.6	14.9	13.3	9
CRWT233	16.5	11.4	13.6	13.1	12.5	10.6	14.8	13.2	1
Site mean yield (t/ha)	16.4	10.7	13.2	12.5	12.3	12.0	14.5	13.1	
LSD	0.5	0.2	0.4	0.5	0.5	0.5	0.4	0.6	
CV%	2.2	1.2	2.0	2.9	2.9	3.2	1.7	4.1	

Autumn Sown (March compared with April) FEED/BISCUIT Wheat Cultivar Evaluation 2016/2017 Season - yield, t/ha - Canterbury

CULTIVAR	Temuka (March sown)	Temuka (April sown) ¹	Seasons in FAR trials (Autumn sown)
Region	Mid Cant	Mid Cant	
Soil type	Waimakariri sandy loam	Waimakariri sandy loam	
Previous crop	Pasja	Pasja	
Sow date	3 Mar	18 Apr	
Harvest date	21 Feb	21 Feb	
Dryland/Irrigated	Irrigated	Irrigated	
Claire	-	12.7	17
Conqueror	12.7	12.6	3
Empress	12.6	11.6	7
Excede	10.4	11.5	11
Gator	12.4	12.1	4
Graham (CM159)	-	12.9	1
Ignite (KWW59)	12.8	13.5	2
Inferno	12.6	11.7	5
Reflection (SY111978)	13.8	13.2	1
Ruapuna (CRWT227)	13.4	12.1	2
Starfire	11.3	12.0	6
Torch	12.4	12.6	4
Wakanui	12.1	12.0	9
CRWT233	-	12.5	1
Site mean yield (t/ha)	12.4	12.3	
LSD	0.7	0.5	
CV%	3.7	2.9	

1 April-sown trial yields are repeated from the previous table for ease of comparison with March-sown trial yields.

These trials are close together in the same paddock however yield differences between sow dates could be a result of soil variation and not time of sowing.

- Cultivar not included in this trial.

wheat - 2016/2017 yield (t/ha)

CULTIVAR	Balfour	Oreti	Southland mean yield	Sanson*	Seasons in FAR trials (Autumn sown)
Region	Northern Sthland	Central Sthland		Manawatu	
Soil type	Crookston silt loam	Drummond silt loam		Ohakea silt loam	
Previous crop	Peas	Oil seed rape		Peas	
Sow date	6 Apr	6 Apr		18 Apr	
Harvest date	22 Feb	16 Mar		29 Jan	
Dryland/Irrigated	Dryland	Dryland		Dryland	
Claire	11.4	10.3	10.8	6.6	17
Conqueror	11.7	11.2	11.5	4.7	3
Empress	11.9	11.2	11.6	8.5	7
Excede	11.3	10.5	10.9	7.8	11
Gator	11.6	11.2	11.4	7.2	4
Graham (CM159)	13.2	12.8	13.0	10.1	1
Ignite (KWW59)	12.3	11.5	11.9	8.5	2
Inferno	11.9	10.7	11.3	5.1	5
Reflection (SY111978)	11.4	11.6	11.5	10.1	1
Ruapuna (CRWT227)	12.3	12.3	12.3	9.0	2
Starfire	12.1	11.4	11.8	6.8	6
Torch	12.1	11.6	11.9	6.7	4
Wakanui	11.6	10.8	11.2	8.9	9
CRWT233	13.0	11.8	12.4	6.9	1
Site mean yield (t/ha)	11.9	11.3	11.6	7.5	
LSD	0.4	0.4	0.6	0.9	
CV%	2.1	2.7	2.3	8.6	

* Sanson trial affected by lodging, BYDV and Septoria.

Autumn Sown MILLING Wheat

Cultivar Evaluation 2016/2017 Season - yield, t/ha - Canterbury

CULTIVAR	Aylesbury	Methven	Dorie	Winchester	Canterbury mean yield	Seasons in FAR trials (Autumn sown)
Region	Central Canterbury	Mid Canterbury	Mid Canterbury	South Canterbury		
Soil type	Lismore shallow silt loam	Lyndhurst silt loam	Eyre silt loam	Templeton silt loam		
Previous crop	Ryegrass	Radish	Potatoes	Carrots		
Sow date	16 Jun	27 Apr	5 May	10 May		
Harvest date	14 Feb	21 Feb	31 Jan	15 Feb		
Dryland/Irrigated	Irrigated	Irrigated	Irrigated	Irrigated		
Conquest	8.9	12.3	9.5	10.0	10.2	12
Discovery (KWM31)	11.7	14.6	11.1	12.2	12.4	4
Duchess	9.5	13.3	10.8	10.7	11.1	3
Hanson (CRWT204)	11.1	14.0	12.4	11.2	12.2	3
Raffles	10.8	12.8	10.6	13.0	11.8	13
Reliance	9.8	13.2	10.0	10.5	10.9	5
Saracen	10.4	11.9	10.0	10.4	10.7	9
Viceroy	11.0	12.8	11.3	11.3	11.6	7
CRWT218	11.5	13.2	11.6	10.4	11.7	2
Site mean yield (t/ha)	10.5	13.1	10.8	11.1	11.4	
LSD	0.6	0.8	0.6	0.5	0.9	
CV%	3.7	4.2	3.8	3.2	5.6	

Autumn Sown Wheat Grain Quality Data 2016/2017 Season

Southern North Island

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)*
Claire	34	62	11.5	1.5	273
Conqueror	31	55	12.0	2.5	-
Empress	41	70	10.2	0.6	284
Excede	43	72	11.4	0.2	-
Gator	44	69	10.0	0.5	-
Graham (CM159)	50	71	9.7	0.3	-
Ignite (KWW59)	42	70	10.5	0.6	366
Inferno (KWW47)	36	67	11.1	1.1	269
Reflection (SY111978)	40	68	9.5	0.8	-
Ruapuna (CRWT227)	47	70	10.3	0.8	-
Starfire (KWW46)	33	68	11.5	1.9	-
Torch	33	64	11.1	3.3	-
Wakanui	42	74	9.6	0.9	-
CRWT233	38	66	11.6	1.7	-
Mean	39	67	10.9	1.2	298
LSD	-	-	-	-	-

Single trial - no LSD available.

* Feed wheats not tested for falling number.

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

Canterbury April-sown FEED/BISCUIT wheat trials

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)*
Claire	49	73	10.1	1.1	308
Conqueror	46	71	9.3	1.9	-
Empress	46	71	10.3	0.9	288
Excede	51	76	10.4	0.5	-
Gator	52	74	9.6	1.0	-
Graham (CM159)	54	74	9.5	1.0	-
Ignite (KWW59)	52	76	10.6	0.7	322
Inferno (KWW47)	52	75	9.9	1.1	251
Reflection (SY111978)	48	75	9.5	2.3	-
Ruapuna (CRWT227)	51	73	9.7	1.0	-
Starfire (KWW46)	47	75	10.1	1.5	-
Torch	47	74	9.8	1.3	-
Wakanui	51	75	9.5	0.6	-
CRWT233	51	75	10.2	1.0	-
Mean	50	74	10.0	1.2	292
LSD	2	1	0.6	0.5	38

Averaged over seven trials.

Canterbury March-sown FEED/BISCUIT wheat trials

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)*
Conqueror	47	65	11.2	0.9	-
Excede	53	74	11.8	0.2	-
Empress	46	67	10.3	0.7	166
Gator	54	71	10.2	0.2	-
Ignite (KWW59)	58	72	11.0	0.2	-
Inferno (KWW47)	57	71	10.4	0.2	245
Reflection (SY111978)	49	73	9.5	0.7	-
Ruapuna (CRWT227)	53	70	10.2	0.4	-
Starfire (KWW46)	46	71	11.9	0.5	-
Torch	48	66	10.5	0.9	-
Wakanui	51	72	9.9	0.5	-
Mean	52	71	10.7	0.4	206
LSD	-	-	-	-	-

Single trial - no LSD available.

* Feed wheats not tested for falling number.

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

Canterbury MILLING wheat trials

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)
Conquest	46	78	13.9	0.3	420
Discovery (KWM31)	58	77	11.4	0.3	336
Duchess	48	79	12.2	0.9	370
Hanson (CRWT204)	51	76	11.0	0.6	362
Raffles	56	77	11.1	0.9	408
Reliance	51	77	13.2	0.6	387
Saracen	52	78	11.5	0.8	374
Viceroy	51	82	12.3	0.8	392
CRWT218	49	78	11.5	0.9	376
Mean	51	78	12.0	0.7	381
LSD	2	1	0.5	0.5	34

Averaged over four trials.

Southland

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)*
Claire	51	74	9.4	0.7	287
Conqueror	45	72	8.8	2.2	-
Empress	49	74	9.5	0.4	372
Excede	53	76	9.7	0.2	-
Gator	56	75	8.6	0.7	-
Graham (CM159)	58	74	8.4	0.4	-
Ignite (KWW59)	54	75	9.1	0.4	325
Inferno (KWW47)	55	75	9.3	0.9	269
Reflection (SY111978)	48	74	8.9	2.5	-
Ruapuna (CRWT227)	55	74	9.2	0.4	-
Starfire (KWW46)	51	75	9.5	1.3	-
Torch	49	75	9.0	1.0	-
Wakanui	55	76	8.9	0.2	-
CRWT233	54	76	8.9	0.5	-
Mean	53	75	9.1	0.9	313
LSD	3	1	0.8	1.1	191

Averaged over two trials.

* Feed wheats not tested for falling number.

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

Autumn Sown (April) FEED/BISCUIT Wheat - 4 year adjusted mean - relative yield by site

CULTIVAR	Methven	Chertsey Dryland	Chertsey Irrigated	Wakanui*	Temuka	St Andrews	Fairlie		Canterbury dryland yield	Canterbury irrigated yield	Canterbury mean yield	Balfour	Oreti	Southland mean yield	Sanson/Cheltenham	Seasons in FAR trials (Autumn sown)
Region	Mid Cant	Mid Cant	Mid Cant	Mid Cant	South Cant	South Cant	South Cant					Nth Sthland	Central Sthland		Manawatu	
Dryland/Irrigated	Irrigated	Dryland	Irrigated	Irrigated	Irrigated	Dryland	Dryland					Dryland	Dryland		Dryland	
No. of trials	4	4	4	3	4	4	4		12	15	27	4	4	8	4	
Claire	93	93	96	98	100	95	95		95	97	96	95	96	96	91	17
Conqueror	101	100	100	93	100	103	105		103	98	100	101	95	98	91	3
Empress	95	100	94	94	94	99	100		100	94	96	100	103	102	93	7
Excede	99	97	94	93	98	96	95		96	96	96	94	88	91	100	11
Gator	98	99	99	100	96	100	101		100	98	99	100	98	99	95	4
Graham (CM159)	(108)	(108)	(106)	(112)	(105)	(108)	(103)		(106)	(109)	(107)	(113)	(113)	(113)	(125)	1
Ignite (KWW59)	101	103	102	104	109	104	100		102	104	103	99	101	100	107	2
Inferno (KWW47)	97	100	98	102	89	100	98		99	97	98	100	100	100	88	5
Reflection (SY111978)	(102)	(100)	(102)	(103)	(105)	(97)	(98)		(98)	(103)	(101)	(95)	(101)	(98)	(112)	1
Ruapuna (CRWT227)	97	104	105	98	100	108	102		104	100	101	103	109	106	109	2
Starfire (KWW46)	104	99	103	101	100	101	101		100	102	101	103	103	103	98	6
Torch	102	98	103	98	106	105	102		102	102	102	100	102	101	99	4
Wakanui	104	101	101	104	99	106	103		103	102	103	99	98	99	106	2
CRWT233	(101)	(108)	(103)	(104)	(102)	(86)	(105)		(99)	(103)	(102)	(109)	(105)	(107)	(95)	1
Site mean yield (t/ha)	14.4	8.2	12.8	14.5	11.7	10.0	10.9		9.7	13.3	11.7	10.7	11.6	11.2	10.6	
LSD (estab. cv)	5	5	3	8	9	7	3		6	4	4	6	6	6	13	
LSD (new vs estab)	8	8	5	11	15	11	5		9	7	6	9	10	10	20	

* No trial in 2013/14 season

Figures in brackets are only based on one year of data.

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.

Autumn Sown (March) FEED/BISCUIT Wheat - 4 year adjusted mean
- relative yield by site

CULTIVAR	Temuka (March sown)	Years in FAR trials
Region	South Canterbury	
Dryland/Irrigated	Irrigated	
No. of trials	3	
Conqueror	98	3
Empress	94	7
Excede	93	11
Gator	97	4
Ignite (KWW59)	103	2
Inferno	94	5
Reflection (SY111978)	(111)	1
Ruapuna (CRWT227)	108	2
Starfire	99	6
Torch	105	4
Wakanui	97	9
Site mean yield (t/ha)	12.7	
LSD (estab. cv)	11	
LSD (new vs estab.)	16	

Figures in brackets are only based on one year of data.

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.

Autumn Sown MILLING Wheat Canterbury - 4 year adjusted mean
- relative yield by site

CULTIVAR	Aylesbury/ Norwood	Methven	Dorie	Winchester ⁺	Canterbury irrigated mean yield	Seasons in FAR trials (Autumn sown)
Region	Central Canterbury	Mid Canterbury	Mid Canterbury	Mid Canterbury		
Dryland/ Irrigated	Irrigated	Irrigated	Irrigated	Irrigated		
No. of trials	4	4	4	1		
Conquest	92	97	89	90	92	12
Discovery (KWM31)	107	106	102	110	107	4
Duchess	97	104	98	96	99	3
Hanson (CRWT204)	106	101	114	101	105	3
Raffles	97	96	100	118	102	13
Reliance	97	103	94	95	97	5
Saracen	97	96	94	94	95	9
Viceroy	102	102	104	102	103	7
CRWT218	106	96	104	94	100	2
Site mean yield (t/ha)	11.5	11.9	10.5	11.1	11.3	
LSD (estab. cv)	9	10	10	-	8	
LSD (new vs estab.)	14	14	16	-	13	

⁺ First trial in this location, means based on one year of data.

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.

Autumn Sown Wheat - plant counts 2016/2017 season

Canterbury FEED/BISCUIT Wheat Trials (target plant population = 125 plants/m² for March sown and 150 plants/m² for April sown)

CULTIVAR	March-sown plants/m ²	April-sown plants/m ²
Claire	-	144
Conqueror	181	150
Empress	199	135
Excede	191	147
Gator	211	151
Graham (CM159)	-	156
Ignite (KWW59)	206	156
Inferno (KWW47)	188	136
Reflection (SY111978)	196	137
Ruapuna (CRWT227)	191	159
Starfire (KWW46)	184	146
Torch	200	125
Wakanui	195	151
CRWT233	-	154
Mean	193	145
LSD	-	8

Means are for one site for March-sown trials and over seven sites for April-sown trials.
- Cultivar not included in this trial.

Canterbury MILLING Wheat Trials (target plant population = 175 plants/m²)

CULTIVAR	Plants/m ²
Conquest	210
Discovery (KWM31)	188
Duchess	194
Hanson (CRWT204)	218
Raffles	192
Reliance	212
Saracen	176
Viceroy	194
CRWT218	197
Mean	198
LSD	24

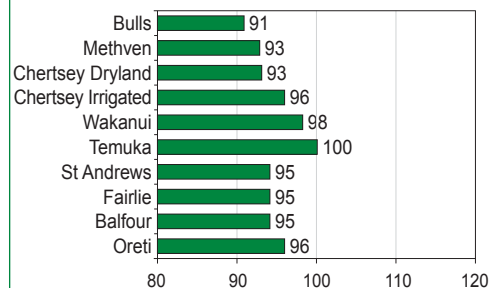
Means are over four sites.

CLAIRE

YEAR 17

Average to below average yielding biscuit and feed cultivar. Relatively susceptible to most diseases but has moderate resistance to leaf rust. A late maturing cultivar with moderate straw strength. Be aware of sprouting risk.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	95
Irrigated sites (4 year)	97

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Late
Sprouting risk	Moderate-high

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	37	44	47		
Test weight (kg/hl)	65	71	73		
Protein (%) (N% x 5.7)	10.7	10.3	9.3		
Falling number (sec)	266	298	290		
Screenings (%)	3.1	1.4	1.4		

END USE

BACKGROUND

Breeder	Limagrain Europe S.A.
Agent	PGG Wrightson Grain

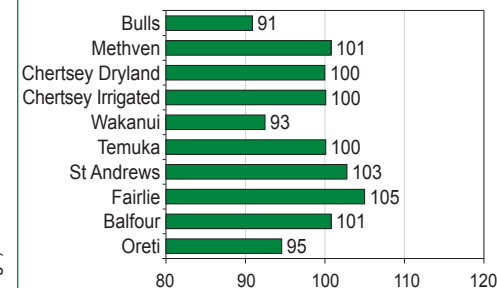
Note: Yields are relative to other feed/biscuit wheats only.

CONQUEROR

YEAR 3

Conqueror is a feed cultivar producing mostly average to above average yields. Monitor for septoria leaf blotch and particularly for leaf rust. Good standing power, intermediate maturity and low to moderate sprouting risk.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	103
Irrigated sites (4 year)	98

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	36	43	43		
Test weight (kg/hl)	64	70	71		
Protein (%) (N% x 5.7)	10.7	9.4	8.5		
Falling number (sec)	-	-	-		
Screenings (%)	3.2	2.2	2.3		

END USE

BACKGROUND

Breeder	KWS UK
Head licensee/Agent	Carrfields Grain & Seed

Note: Yields are relative to other feed/biscuit wheats only.

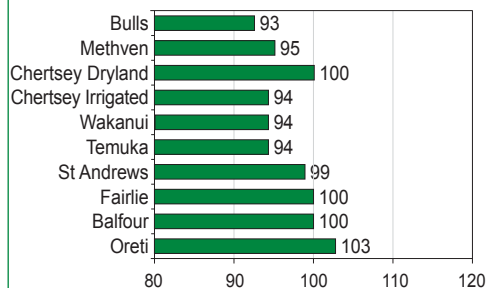
Scores followed by * indicate resistance is affected by pathotypes present (score is an average).

EMPRESS

YEAR 7

Low yields for this biscuit wheat at some Canterbury irrigated sites last season have pulled the irrigated 4 year average down to 94%. Good resistance to septoria leaf blotch and stripe rust but now has intermediate resistance to leaf rust and powdery mildew. It is of medium height with stiff straw strength.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	100
Irrigated sites (4 year)	94

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	35	42	45		
Test weight (kg/hl)	64	70	73		
Protein (%) (N% x 5.7)	10.7	10.3	9.5		
Falling number (sec)	328	292	318		
Screenings (%)	3.2	1.3	0.8		

END USE

Biscuit

BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds, Carrfields Grain & Seed

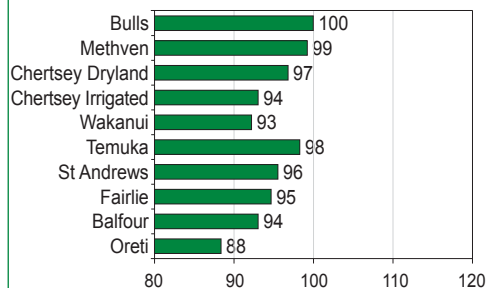
Note: Yields are relative to other feed/biscuit wheats only.

EXCEDE

YEAR 11

A below average yielding feed cultivar. Moderately resistant to most foliar diseases with the exception of septoria leaf blotch. This European feed cultivar has good straw strength, and low sprouting risk.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	96
Irrigated sites (4 year)	96

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short
Maturity	Intermediate
Sprouting risk	Low

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	44	47	49		
Test weight (kg/hl)	72	74	75		
Protein (%) (N% x 5.7)	10.8	10.7	9.9		
Falling number (sec)	333	339	343		
Screenings (%)	1.4	0.7	0.8		

END USE

Feed

BACKGROUND

Head licensee	Plant & Food Research
Agent	Luisetti Seeds, Carrfields Grain & Seed

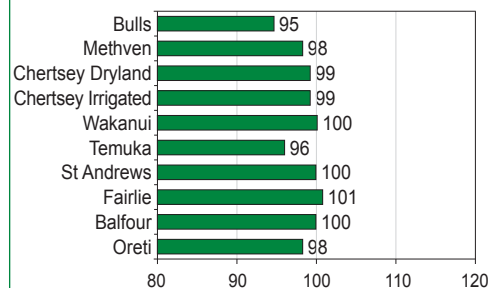
Note: Yields are relative to other feed/biscuit wheats only.

GATOR

YEAR 4

Mostly average yielding in Canterbury with below average yields in southern North Island. Monitor for septoria leaf blotch and leaf rust. Good resistance to powdery mildew. A short, stiff strawed variety with low sprouting risk.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	100
Irrigated sites (4 year)	98

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short
Maturity	Intermediate
Sprouting risk	Low

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	43	49	51		
Test weight (kg/hl)	68	72	73		
Protein (%) (N% x 5.7)	10.3	9.6	8.6		
Falling number (sec)	-	-	-		
Screenings (%)	2.1	1.2	1.4		

END USE

Feed

BACKGROUND

Breeder	KWS, UK
Licensee/Agent	Carrfields Grain & Seed

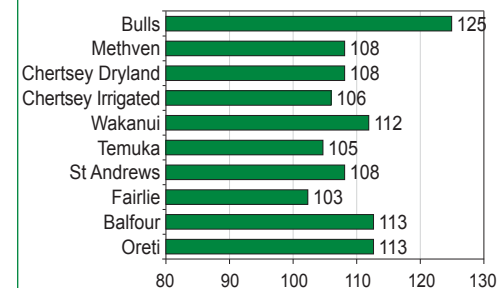
Note: Yields are relative to other feed/biscuit wheats only.

GRAHAM (CM159)

YEAR 1

A new cultivar that has been very high yielding in its first year of CPT 2 trials. Graham yielded similar to Wakanui in CPT1 trials. Good resistance to the common wheat diseases, especially stripe rust and fusarium head blight. An early maturing, stiff strawed variety with low sprouting risk.

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



Note: The scale is different on this graph

IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	106
Irrigated sites (4 year)	109

DISEASE RESISTANCE

Septoria leaf blotch	Moderately resistant
Stripe rust	Mostly resistant
Leaf rust	Moderately resistant
Powdery mildew	Moderately resistant
Fusarium head blight	Mostly resistant

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Early
Sprouting risk	Low

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	51	50	53		
Test weight (kg/hl)	72	72	73		
Protein (%) (N% x 5.7)	9.3	9.6	8.5		
Falling number (sec)	-	-	-		
Screenings (%)	1.6	1.2	0.9		

END USE

Biscuit

BACKGROUND

Breeder	Syngenta
Agent	Cropmark Seeds

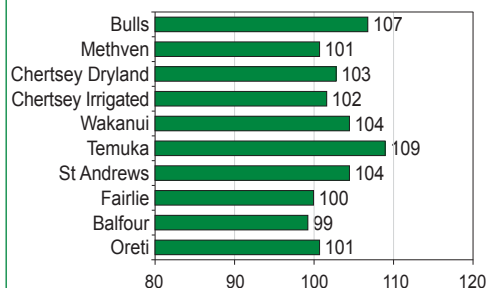
Note: Yields are relative to other feed/biscuit wheats only.

IGNITE (KWW59)

YEAR 2

Ignite is a feed and potential biscuit cultivar that produced mostly average to above average yields in its second year in CPT 2 trials. Moderately susceptible to leaf rust with good resistance to most other diseases, especially fusarium head blight. A medium height plant with a stiff straw and low to moderate sprouting risk.

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

**IRRIGATION RESPONSE (Canterbury rel yield)**

Dryland sites (4 year)	102
Irrigated sites (4 year)	104

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	42	47	49		
Test weight (kg/hl)	70	72	74		
Protein (%) (N% x 5.7)	10.4	9.8	9.4		
Falling number (sec)	366	307	316		
Screenings (%)	1.9	1.0	0.8		

END USE Feed, potential biscuit

BACKGROUND

Breeder	Limagrain Europe S.A.
Licensee/Agent	PGG Wrightson Grain

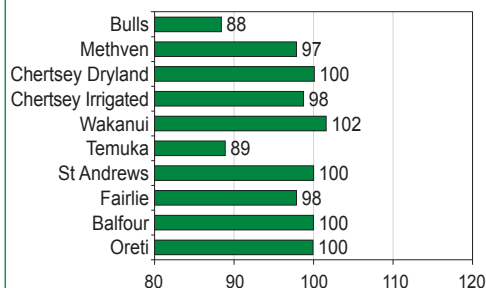
Note: Yields are relative to other feed/biscuit wheats only.

INFERNO (KWW47)

YEAR 5

Inferno is a feed and biscuit wheat producing mostly average yields at dryland sites in Canterbury and Southland. Yields more variable at irrigated sites. Moderately susceptible to some stripe rust pathotypes, but shows resistance to other diseases. A taller cultivar with moderate straw strength, so consider a more robust PGR programme.

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

**IRRIGATION RESPONSE (Canterbury rel yield)**

Dryland sites (4 year)	99
Irrigated sites (4 year)	97

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium-tall
Maturity	Late
Sprouting risk	Low-moderate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	37	48	48		
Test weight (kg/hl)	67	73	74		
Protein (%) (N% x 5.7)	10.6	10.0	9.4		
Falling number (sec)	276	261	262		
Screenings (%)	3.0	1.2	1.6		

END USE Biscuit, feed

BACKGROUND

Breeder	Limagrain Europe S.A.
Agent	PGG Wrightson Grain

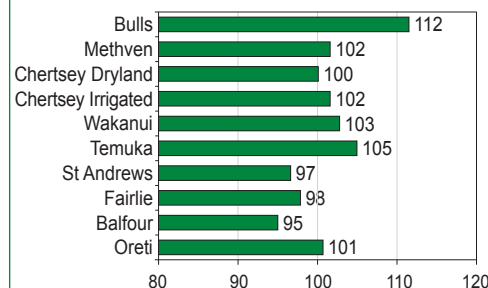
Note: Yields are relative to other feed/biscuit wheats only.

REFLECTION (SY111978)

YEAR 1

A new feed cultivar that has yielded above average on Canterbury irrigated sites and is high yielding in the Manawatu. Good resistance to most foliar diseases. A stiff short strawed variety with early maturity and low to moderate sprouting risk.

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

**IRRIGATION RESPONSE (Canterbury rel yield)**

Dryland sites (4 year)	98
Irrigated sites (4 year)	103

DISEASE RESISTANCE

Septoria leaf blotch	Moderately resistant
Stripe rust	Intermediate resistance
Leaf rust	Moderately resistant
Powdery mildew	Moderately resistant
Fusarium head blight	Moderately resistant

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short
Maturity	Early
Sprouting risk	Low-moderate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	38	44	45		
Test weight (kg/hl)	68	73	73		
Protein (%) (N% x 5.7)	9.5	9.6	9.2		
Falling number (sec)	-	-	-		
Screenings (%)	3.1	2.7	2.9		

END USE Feed

BACKGROUND

Breeder	Syngenta
Licensee/Agent	Cropmark Seeds

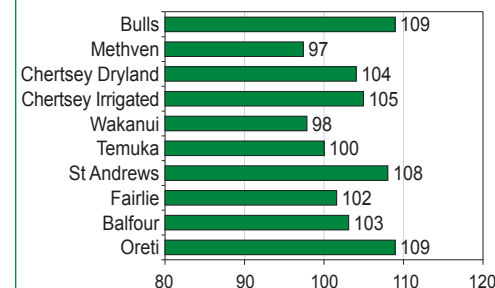
Note: Yields are relative to other feed/biscuit wheats only.

RUAPUNA (CRWT227)

YEAR 2

Ruapuna is an average to high yielding feed cultivar in its second year of CPT 2 trials. Good performer at dryland sites, especially in Southland and Manawatu. Moderately susceptible to septoria leaf blotch and leaf rust. A medium height cultivar with a stiff straw and low to moderate sprouting risk.

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

**IRRIGATION RESPONSE (Canterbury rel yield)**

Dryland sites (4 year)	104
Irrigated sites (4 year)	100

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	44	47	49		
Test weight (kg/hl)	69	71	72		
Protein (%) (N% x 5.7)	10.2	9.8	9.2		
Falling number (sec)	164	257	168		
Screenings (%)	2.2	1.2	1.2		

END USE Feed

BACKGROUND

Breeder	Sejet
Agent	Luisetti Seeds

Note: Yields are relative to other feed/biscuit wheats only.

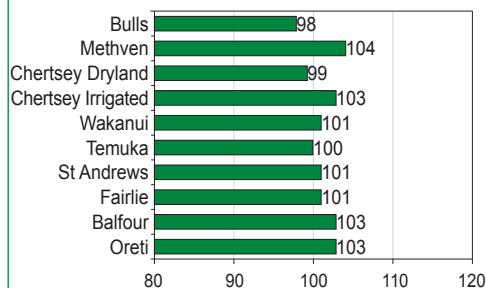
Scores followed by * indicate resistance is affected by pathotypes present (score is an average).

STARFIRE

YEAR 6

An average to above average yielding feed cultivar. Moderately susceptible to leaf rust but shows moderate to intermediate resistance to other foliar diseases. Starfire is stiff strawed with moderate sprouting risk and intermediate maturity.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	100
Irrigated sites (4 year)	102

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate
Sprouting risk	Moderate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	37	44	46		
Test weight (kg/hl)	68	73	74		
Protein (%) (N% x 5.7)	10.6	10.0	9.3		
Falling number (sec)	188	204	217		
Screenings (%)	2.9	1.6	2.1		

END USE	Feed
---------	------

BACKGROUND

Breeder	Limagrain Europe S.A.
Agent	PGG Wrightson Grain

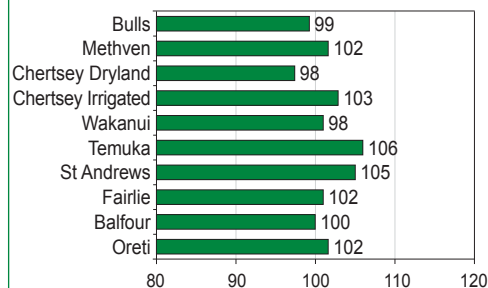
Note: Yields are relative to other feed/biscuit wheats only.

TORCH

YEAR 5

Torch is a mostly average to above average yielding feed cultivar. It is now moderately susceptible to leaf rust but has moderate to intermediate resistance to most other foliar diseases. Good standing power coupled with late maturity and a low sprouting risk.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	102
Irrigated sites (4 year)	102

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Late
Sprouting risk	Low

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	37	44	46		
Test weight (kg/hl)	68	72	74		
Protein (%) (N% x 5.7)	10.2	9.7	9.2		
Falling number (sec)	-	-	-		
Screenings (%)	3.7	1.9	1.5		

END USE	Feed
---------	------

BACKGROUND

Breeder	RAGT, UK
Licensee	Seed Force Limited
Agent	Cates Grain and Seed, Plant Research (NZ) Ltd

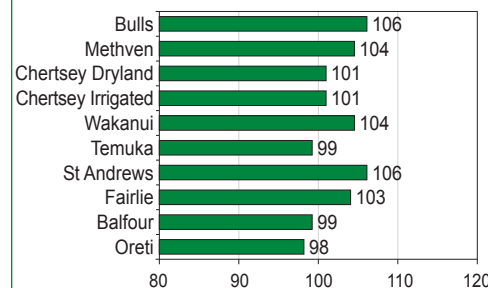
Note: Yields are relative to other feed/biscuit wheats only.

WAKANUI

YEAR 9

Wakanui is a mostly average to above average yielding feed cultivar, performing well on both irrigated and dryland sites. It shows varying levels of resistance to most diseases, but is moderately susceptible to powdery mildew. Late maturing and tall but with a stiff straw.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	103
Irrigated sites (4 year)	102

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Tall
Maturity	Late
Sprouting risk	Moderate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	42	47	50		
Test weight (kg/hl)	73	74	75		
Protein (%) (N% x 5.7)	10.0	9.6	9.0		
Falling number (sec)	208	244	252		
Screenings (%)	1.9	0.9	0.7		

END USE	Feed
---------	------

BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds, Carrfields Grain & Seed

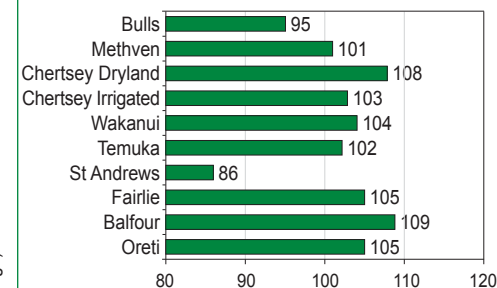
Note: Yields are relative to other feed/biscuit wheats only.

CRWT233

YEAR 1

CRWT233 is a new feed wheat. In its first year of CPT 2 trials it has mostly produced above average yields, except for in Manawatu and St Andrews. Shows useful resistance to most diseases, particularly the rusts. A medium to tall cultivar with moderate straw strength and intermediate maturity.

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



IRRIGATION RESPONSE (Canterbury rel yield)

Dryland sites (4 year)	99
Irrigated sites (4 year)	103

DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	39	47	50		
Test weight (kg/hl)	67	73	75		
Protein (%) (N% x 5.7)	11.2	10.2	8.9		
Falling number (sec)	-	-	-		
Screenings (%)	3.0	1.2	1.0		

END USE	Feed
---------	------

BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds

Note: Yields are relative to other feed/biscuit wheats only.

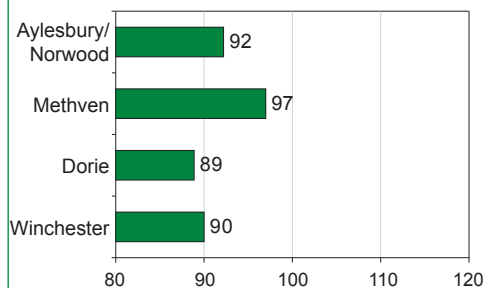
Scores followed by * indicate resistance is affected by pathotypes present (score is an average).

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

CONQUEST

YEAR 12

Below average yielding premium milling cultivar with high protein content. Conquest has moderate resistance to stripe rust. Monitor for leaf rust, septoria leaf blotch and powdery mildew. Early maturing with a moderate to stiff straw and excellent sprouting resistance and falling number.

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


DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth Nth Is	Canty	Sthld
TGW (g)		44	
Test weight (kg/hl)		77	
Protein (%) (N% x 5.7)		13.4	
Falling number (sec)		399	
Screenings (%)		0.5	

END USE	Premium milling
---------	-----------------

BACKGROUND

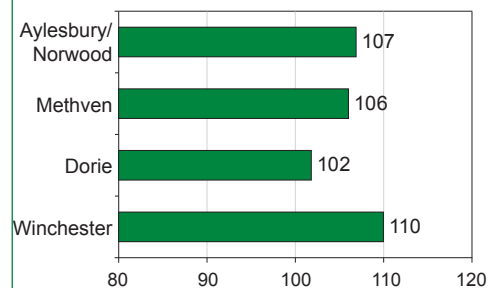
Breeder Agent	Plant & Food Research Luisetti Seeds
---------------	---

Note: Yields are relative to other milling wheats only.
Scores followed by * indicate resistance is affected by pathotypes present (score is an average).

DISCOVERY (KWM31)

YEAR 4

An above average to high yielding milling wheat cultivar, with low to moderate sprouting risk. Shows good resistance to most diseases, with the exception of fusarium head blight. Discovery is susceptible to lodging and shattering and will benefit from a strong PGR programme. Intermediate maturity with large grain size.

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


DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth Nth Is	Canty	Sthld
TGW (g)		55	
Test weight (kg/hl)		76	
Protein (%) (N% x 5.7)		11.4	
Falling number (sec)		342	
Screenings (%)		0.6	

END USE	Bread
---------	-------

BACKGROUND

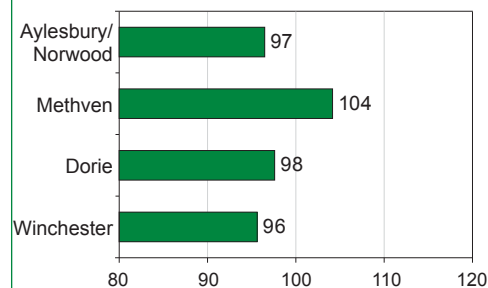
Breeder Agent	Limagrain Europe S.A. PGG Wrightson Grain
---------------	--

Note: Yields are relative to other milling wheats only.

DUCHESS

YEAR 3

A premium milling cultivar, with yields on average 6% higher than Conquest and with a similar grain size. Duchess is moderately susceptible to leaf rust and powdery mildew and has intermediate resistance to septoria leaf blotch and stripe rust. This stiff strawed cultivar has intermediate maturity with low sprouting risk.

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


DISEASE RESISTANCE

Septoria leaf blotch	Intermediate resistance
Stripe rust	Intermediate resistance
Leaf rust	Moderately susceptible
Powdery mildew	Moderately susceptible
Fusarium head blight	Intermediate resistance

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate
Sprouting risk	Low

GRAIN QUALITY (4 year means)	Sth Nth Is	Canty	Sthld
TGW (g)		44	
Test weight (kg/hl)		77	
Protein (%) (N% x 5.7)		12.0	
Falling number (sec)		378	
Screenings (%)		1.5	

END USE	Milling
---------	---------

BACKGROUND

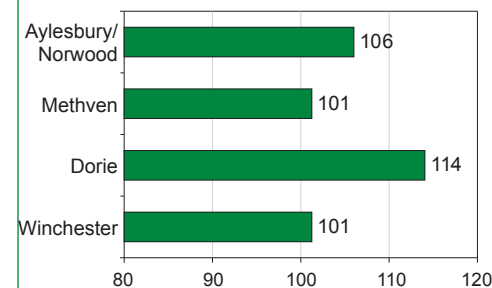
Breeder Agent	Plant & Food Research Luisetti Seeds
---------------	---

Note: Yields are relative to other milling wheats only.

HANSON (CRWT204)

YEAR 3

Hanson is a gristing wheat that has been higher yielding at the Dorie and Norwood sites. Shows susceptibility to powdery mildew and fusarium head blight. Intermediate maturity with a stiff straw and low to moderate sprouting risk.

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


DISEASE RESISTANCE

Septoria leaf blotch	Intermediate resistance
Stripe rust	Moderately resistant
Leaf rust	Intermediate resistance
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 Is	Canty	Sthld
TGW (g)		46	
Test weight (kg/hl)		74	
Protein (%) (N% x 5.7)		11.0	
Falling number (sec)		365	
Screenings (%)		1.2	

END USE	Milling
---------	---------

BACKGROUND

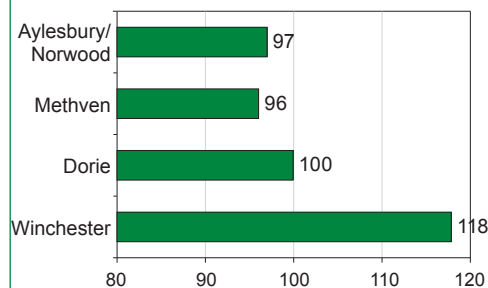
Breeder Agent	Plant & Food Research Luisetti Seeds
---------------	---

Note: Yields are relative to other milling wheats only.

RAFFLES

YEAR 13

Raffles is a mostly below average yielding feed and gristing cultivar. Large grain with high falling number. Monitor for rusts. Moderately resistant to powdery mildew and septoria leaf blotch. A tall cultivar with moderate straw strength and low sprouting risk.

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


DISEASE RESISTANCE

Septoria leaf blotch	Moderately resistant
Stripe rust	Mostly susceptible
Leaf rust	Mostly 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	Is	Canty	Sthld
TGW (g)				53	
Test weight (kg/hl)				76	
Protein (%) (N% x 5.7)				11.0	
Falling number (sec)				401	
Screenings (%)				1.0	

END USE	Gristing, feed
---------	----------------

BACKGROUND

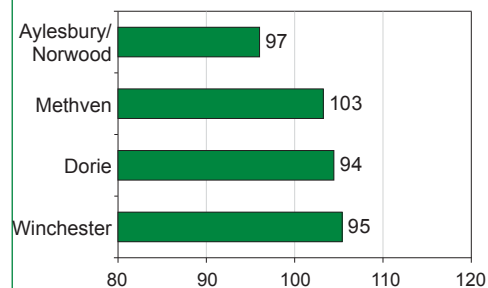
Breeder	KWS, UK
Agent	Carrfields Grain & Seed

Note: Yields are relative to other milling wheats only.

RELIANCE

YEAR 5

A premium milling cultivar with yields on average 5% higher than Conquest and with a larger grain size. Shows moderate resistance to stripe rust but has susceptibility to most other diseases. Reliance produces high proteins, has good straw strength and a low risk of sprouting.

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


DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)				47	
Test weight (kg/hl)				76	
Protein (%) (N% x 5.7)				12.8	
Falling number (sec)				373	
Screenings (%)				1.1	

END USE	Bread
---------	-------

BACKGROUND

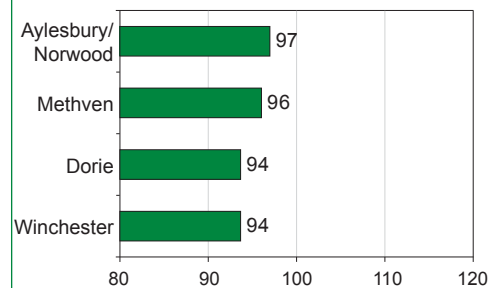
Breeder	Plant & Food Research
Agent	Luisetti Seeds

Note: Yields are relative to other milling wheats only.

SARACEN

YEAR 9

Saracen is a mostly below average yielding milling wheat with susceptibility to leaf rust and fusarium head blight. Moderately resistant to septoria leaf blotch, stripe rust and powdery mildew. Saracen is a stiff short straved variety with intermediate maturity and low sprouting risk.

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


DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short
Maturity	Intermediate
Sprouting risk	Low

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)				49	
Test weight (kg/hl)				76	
Protein (%) (N% x 5.7)				11.4	
Falling number (sec)				376	
Screenings (%)				1.3	

END USE	Bread
---------	-------

BACKGROUND

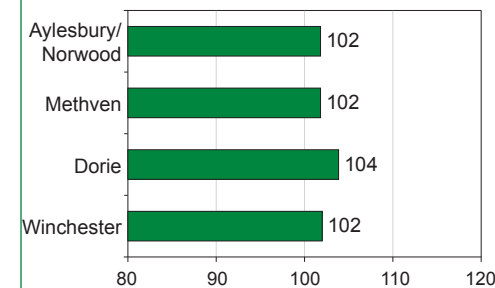
Breeder	Plant & Food Research
Agent	Luisetti Seeds

Note: Yields are relative to other milling wheats only.

VICEROY

YEAR 7

Average to above average yielding milling cultivar with high test weights. Moderately susceptible to most foliar diseases but shows moderate resistance to stripe rust. Viceroy is medium to tall with a stiff straw and low to moderate sprouting risk.

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


DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)				48	
Test weight (kg/hl)				80	
Protein (%) (N% x 5.7)				12.0	
Falling number (sec)				401	
Screenings (%)				1.2	

END USE	Bread
---------	-------

BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds

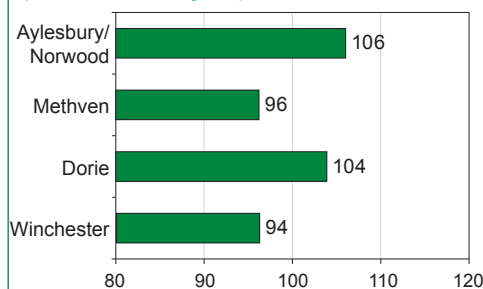
Note: Yields are relative to other milling wheats only.

CRWT218

YEAR 2

CRWT218 is a new potential premium milling wheat producing variable yields in its second year of CPT 2 trials. Monitor for septoria leaf blotch, leaf rust and particularly powdery mildew. Shows some resistance to stripe rust and fusarium head blight. A tall stiff strawed variety with intermediate maturity and low to moderate sprouting risk.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)					45
Test weight (kg/hl)					76
Protein (%) (N% x 5.7)					11.5
Falling number (sec)					380
Screenings (%)					1.1

END USE	Milling
---------	---------

BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds

Note: Yields are relative to other milling wheats only.

BALFOUR, EASTERN SOUTHLAND

Lintley and Longridge soils, Dryland

Trial operator: Stewart Armstrong

Host farmer: Earl Dillon

This trial was sown on 29 April 2016 into a crop of Cassia following wheat. The site received 129 kg N/ha split between two applications. Two herbicide applications and two fungicides were applied during the season. The trial established well and was harvested on 24 January 2017.

RAKAIA, MID CANTERBURY

Lismore silt loam, Irrigated

Trial operator: Matt Hicks

Host farmer: Ross Hewson

This barley trial was sown on 6 May 2016 into a crop of Tavern following ryegrass. The site received 246 kg N/ha split between three applications. Three herbicide applications, three insecticides and two PGRs were applied during the season. The trial received two fungicides and three irrigations totalling 75 mm. Considerable brackling and Ramularia were noted at harvest on 17 January 2017.

ST ANDREWS, SOUTH CANTERBURY

Templeton silt loam, Dryland

Trial operator: Matt Hicks

Host farmer: Nick Porter

This trial was sown on 28 April 2016 into a crop of Sanette following wheat. The trial received 138 kg N/ha split between two applications. Three fungicide applications, two herbicides, an insecticide and a PGR were applied during the growing season. Brackling was noted at harvest on 16 January 2017.



2016/2017 trial site location map

CULTIVAR	Years in FAR trials	Scald	Net blotch (net form)	Leaf rust	Powdery mildew	Straw strength	Crop height	Maturity
Calibre	7	MSS	MR	MSS	MR	Moderate	Med-tall	Early-int
Fortitude (CRBA144)	3	MRMS	MR	MRMS	(MRR)	Moderate	Medium	Intermediate
Garner	6	MSS	MR	MSS	MR	Stiff	Tall	Intermediate
Jimpy	9	MR	MR	MSS	MS	Moderate-stiff	Medium	Int-late
Laureate (SY412-328)	1	(MR)	(MRR)	(MRMS)	Unknown	Moderate	Medium	Early-int
Piper (SYN411-287)	3	MS	MS	MSS	(MRR)	Stiff	Medium	Intermediate
RGT Planet	1	MR	MS	MS	(MRR)	Moderate	Medium	Early-int
Sanette	5	MR	MR	MS	(MRR)	Moderate	Medium	Early-int
Scholar (SYN411-285)	4	MS	MR	MR	(MRR)	Stiff	Medium	Int-late
Snakebite	9	MS	MSS	MSS	MS	Stiff	Medium	Early-int
Sumit	6	MS	MS	MS	MS	Stiff	Short-med	Early-int
Tavern	13	MR	MS	MSS	MR*	Stiff	Short-med	Intermediate
CRBA146	2	MR	MR	MSS	(MRR)	Moderate	Medium	Intermediate
SYN413-345	1	MR	MR	MS	(MRR)	Moderate-stiff	Short-med	Early
SYN413-347	2	MS	MRMS	MS	(MRR)	Moderate-stiff	Short-med	Early-int

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).
 Unknown* indicates there is insufficient trial information in NZ to assess resistance.
 (Brackets) indicate there is limited NZ trial data to assess resistance.

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

Autumn Sown Barley Cultivar Evaluation 2016/2017 Season - yield (t/ha)

CULTIVAR	Rakaia	St Andrews	Balfour	Seasons in FAR trials (Autumn sown)
Region	Mid Canterbury	South Canterbury	Southland	
Soil Type	Lismore silt loam	Templeton silt loam	Lintley silt loam	
Previous crop	Ryegrass	Wheat	Wheat	
Sowing date	6 May	28 Apr	28 Apr	
Harvest date	17 Jan	16 Jan	24 Jan	
Dryland/Irrigated	Irrigated	Dryland	Dryland	
Calibre	7.2	7.0	9.1	7
Garner	6.7	6.5	9.0	6
Fortitude (CRBA144)	7.8	7.3	9.1	3
Jimpy	6.6	6.9	8.7	9
Laureate (SY412-328)	7.7	7.5	10.0	1
Piper (SYN411-287)	8.0	8.1	9.5	3
RGT Planet	8.0	8.2	9.6	1
Sanette	6.4	7.4	9.6	5
Scholar	7.5	7.5	9.2	4
Snakebite	9.0	7.8	9.6	9
Sumit	6.7	7.3	9.3	6
Tavern	7.3	7.7	9.0	13
CRBA146	6.8	7.2	9.2	2
SYN413-345	7.2	7.7	9.6	1
SYN413-347	7.2	8.7	10.2	2
Site mean yield (t/ha)	7.3	7.5	9.4	
LSD	0.5	0.6	0.4	
CV%	4.8	5.6	3.3	

Canterbury

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Calibre	39	51	11.7	28.7
Garner	37	50	11.4	34.3
Fortitude (CRBA144)	36	54	12.5	19.5
Jimpy	34	53	12.3	42.4
Laureate (SY412-328)	38	51	12.6	27.5
Piper (SYN411-287)	39	52	10.9	24.4
RGT Planet	41	55	11.4	15.7
Sanette	39	53	11.5	25.3
Scholar	37	54	12.0	31.8
Snakebite	39	55	12.3	14.9
Sumit	37	54	10.8	32.4
Tavern	37	55	11.4	28.6
CRBA146	39	52	12.1	22.1
SYN413-345	39	54	9.9	18.0
SYN413-347	37	47	11.5	37.6
Mean	38	53	11.6	26.9
LSD	4	4	2.0	13.0

Southland

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Calibre	53	58	7.6	3.4
Garner	51	57	7.1	3.4
Fortitude (CRBA144)	51	60	7.4	1.7
Jimpy	47	57	7.6	3.1
Laureate (SY412-328)	52	59	7.9	3.4
Piper (SYN411-287)	54	57	7.6	1.3
RGT Planet	56	59	7.9	2.3
Sanette	52	55	6.8	1.7
Scholar	48	57	7.0	2.5
Snakebite	53	60	8.6	1.6
Sumit	49	55	7.2	3.4
Tavern	54	58	7.8	2.2
CRBA146	50	61	7.2	1.8
SYN413-345	51	55	7.1	2.8
SYN413-347	56	56	7.6	1.7
Mean	52	58	7.5	2.4
LSD*	-	-	-	-

* Single trial - no LSD available.

The Canterbury and Southland quality data are also presented as 4 year means on the individual cultivar description pages.

2016/17 Screenings from the Canterbury trials have been omitted from the 4 year quality means.

Autumn Sown Barley - 4 year adjusted mean - relative yield by site

CULTIVAR	Rakaia*	St Andrews	Canterbury mean yield	Balfour	Seasons in FAR trials (Autumn sown)
Region	Mid Canterbury	South Canterbury		Southland	
Dryland/Irrigated	Irrigated	Dryland		Dryland	
No. of trials	2	4	6	4	
Calibre	97	96	96	92	7
Fortitude (CRBA144)	106	98	102	99	3
Garner	94	95	95	97	6
Jimpy	93	95	94	99	9
Laureate (SY412-328)	(104)	(100)	(102)	(108)	1
Piper (SYN411-287)	108	104	106	99	3
RGT Planet	(108)	(108)	(108)	(103)	1
Sanette	96	101	99	104	5
Scholar (SYN411-285)	103	102	103	96	4
Snakebite	106	96	101	99	9
Sumit	95	98	97	98	6
Tavern	98	98	98	100	13
CRBA146	94	98	96	100	2
SYN413-345	(98)	(102)	(100)	(102)	1
SYN413-347	99	108	104	106	2
Site mean yield (t/ha)	8.4	8.9	8.7	8.1	
LSD (estab. cv)	20	5	9	7	
LSD (new vs estab.)	24	8	14	10	

* Mean of two trials (no trial in 2014/15 and 2015/16 excluded due to fungicide issue).

Figures in brackets are only based on one year of data.

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

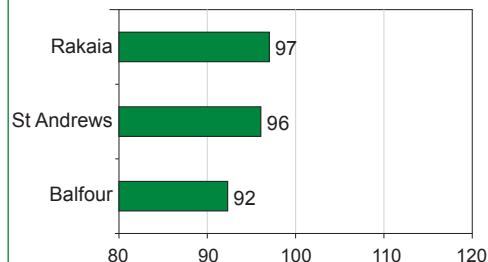
LSD (new vs estab.) is for comparing a "new" (first year) cultivar with an "established" cultivar.

CALIBRE

YEAR 7

A feed cultivar producing below average yields. Calibre is mostly susceptible to scald and leaf rust. Shows moderate resistance to net blotch and powdery mildew. A medium to tall variety with moderate straw strength.

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



DISEASE RESISTANCE

Scald	Mostly susceptible
Net blotch	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Moderately resistant

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium-tall
Maturity	Early-intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	45	47
Test weight (kg/hl)	60	62
Protein (%) (N% x 6.25)	9.5	8.9
Screenings (%)	2.5	3.0

END USE	Feed
---------	------

BACKGROUND

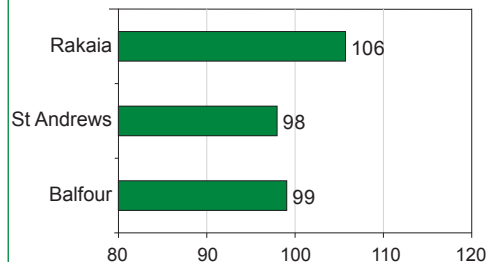
Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Carrfields Grain & Seed

FORTITUDE (CRBA144)

YEAR 3

Fortitude (CRBA 144) has produced average to above average yields. Shows varying levels of resistance to most diseases. A medium height feed variety with moderate straw strength and intermediate maturity.

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



DISEASE RESISTANCE

Scald	Intermediate resistance
Net blotch	Moderately resistant
Leaf rust	Intermediate resistance
Powdery mildew	Mostly resistant

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	44	47
Test weight (kg/hl)	61	63
Protein (%) (N% x 6.25)	9.6	8.4
Screenings (%)	1.1	2.0

END USE	Feed
---------	------

BACKGROUND

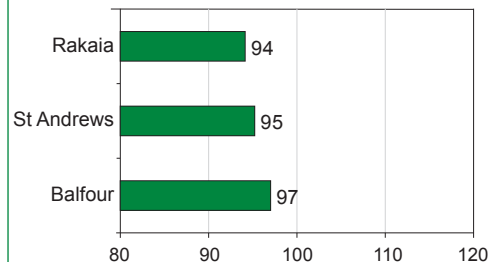
Breeder	Sejet
Head Licensee	Plant and Food Research
Agent	Luisetti Seeds

GARNER

YEAR 6

Average to below average yielding feed cultivar. Watch for scald and leaf rust. Moderately resistant to net blotch and powdery mildew. Garner is a tall stiff strawed cultivar with intermediate maturity.

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



DISEASE RESISTANCE

Scald	Mostly susceptible
Net blotch	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Moderately resistant

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Tall
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	44	47
Test weight (kg/hl)	58	61
Protein (%) (N% x 6.25)	9.2	8.4
Screenings (%)	2.9	3.1

END USE	Feed
---------	------

BACKGROUND

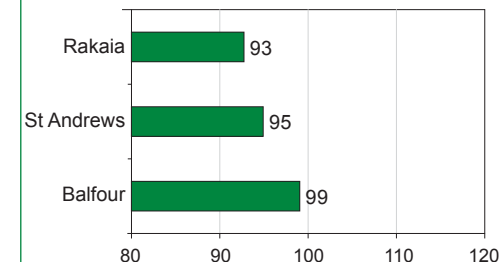
Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

JIMPY

YEAR 9

A malting cultivar with average yields in Southland and below average in Canterbury. Jimpy is moderately resistant to scald and net blotch. Monitor for leaf rust and powdery mildew. A moderate to stiff strawed cultivar with intermediate to late maturity.

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



DISEASE RESISTANCE

Scald	Moderately resistant
Net blotch	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Moderately susceptible

FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Intermediate-late

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	42	46
Test weight (kg/hl)	61	62
Protein (%) (N% x 6.25)	9.7	8.6
Screenings (%)	2.0	2.4

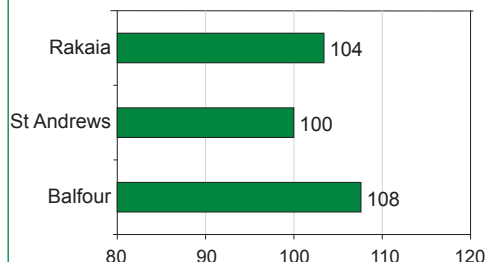
END USE	Malting
---------	---------

BACKGROUND

Breeder	Malteurop
Head Licensee	Malteurop
Agent	Malteurop

LAUREATE (SY412-328) YEAR 1

A new feed variety with malting potential which was high yielding in Southland and average to above average in Canterbury in its first year. Shows varying levels of resistance to most diseases. Laureate is medium height with a moderate straw strength and intermediate maturity.

RELATIVE YIELDS – 4 year adjusted mean (% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately resistant
Net blotch	Mostly resistant
Leaf rust	Intermediate resistance
Powdery mildew	Unknown

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	45	48
Test weight (kg/hl)	58	62
Protein (%) (N% x 6.25)	10.3	9.0
Screenings (%)	2.1	3.6

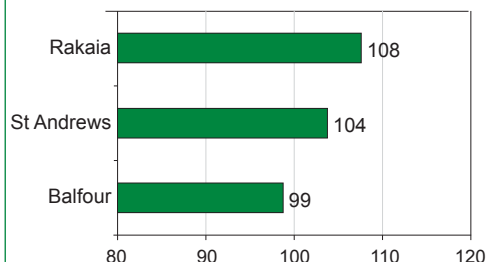
END USE	Malting/Feed
----------------	--------------

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

PIPER (SYN411-287) YEAR 3

In its third year, Piper has produced average yields in Southland and above average to high yielding in Canterbury. Shows susceptibility to most diseases, but is mostly resistant to mildew. A stiff strawed feed cultivar with intermediate maturity.

RELATIVE YIELDS – 4 year adjusted mean (% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately susceptible
Net blotch	Moderately susceptible
Leaf rust	Mostly susceptible
Powdery mildew	Mostly resistant

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	45	49
Test weight (kg/hl)	59	60
Protein (%) (N% x 6.25)	8.9	9.1
Screenings (%)	2.1	1.9

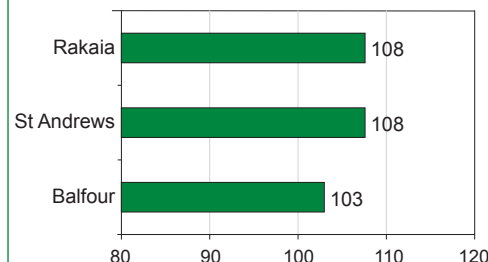
END USE	Feed
----------------	------

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

RGT PLANET (SFR85-014) YEAR 1

RGT Planet is new to the Autumn CPT 2 trials, but has appeared in the Spring CPT 2 trials for the last two seasons. An above average to high yielding feed cultivar with malting potential. Shows resistance to scald and powdery mildew, but is moderately susceptible to most other diseases. A medium height variety with moderate straw strength and early to intermediate maturity.

RELATIVE YIELDS – 4 year adjusted mean (% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately resistant
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)	Canty	Sthld
TGW (g)	48	52
Test weight (kg/hl)	62	62
Protein (%) (N% x 6.25)	9.0	9.0
Screenings (%)	0.3	2.5

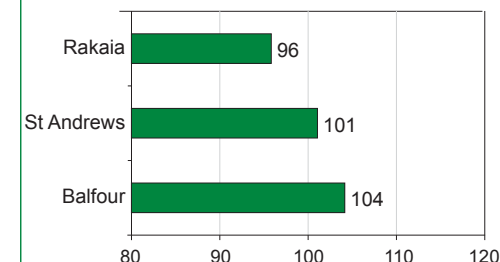
END USE	Feed, malting potential
----------------	-------------------------

BACKGROUND

Breeder	RGT
Head Licensee	Seed Force Ltd
Agent	PGG Wrightson Grain

SANETTE YEAR 5

Average to above average yielding cultivar in South Canterbury and Southland. A low yield in the Rakaia trial in 2016-17 has reduced its four year average yield to below average at this site. Shows varying levels of resistance to most diseases with the exception of leaf rust. A medium height variety with moderate straw strength.

RELATIVE YIELDS – 4 year adjusted mean (% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately resistant
Net blotch	Moderately resistant
Leaf rust	Moderately susceptible
Powdery mildew	Mostly resistant

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	46	48
Test weight (kg/hl)	59	59
Protein (%) (N% x 6.25)	9.2	8.2
Screenings (%)	1.6	2.1

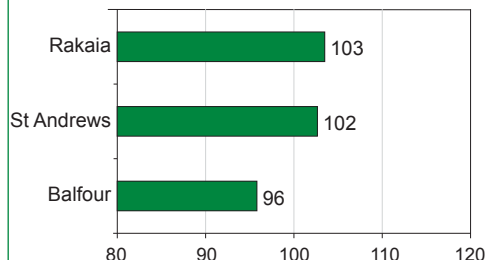
END USE	Feed, malting potential
----------------	-------------------------

BACKGROUND

Breeder	Syngenta
Head licensee	Cropmark Seeds
Agent	PGG Wrightson Grain, Cates Grain and Seed, Advanced Agriculture

SCHOLAR (SYN411-285) YEAR 4

A feed variety producing above average yields in Canterbury, with below average yields in Southland. Moderately susceptible to scald but shows resistance to other diseases. An intermediate to late maturing, stiff strawed cultivar.

RELATIVE YIELDS – 4 year adjusted mean
(% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately susceptible
Net blotch	Moderately resistant
Leaf rust	Moderately resistant
Powdery mildew	Mostly resistant

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate-late

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	43	44
Test weight (kg/hl)	60	61
Protein (%) (N% x 6.25)	9.2	8.6
Screenings (%)	2.4	3.3

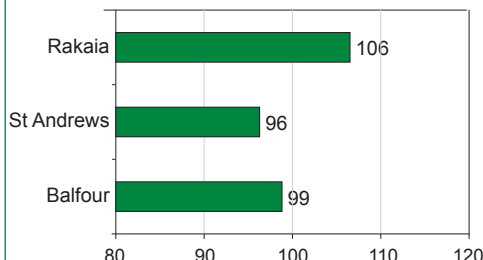
END USE	Feed
---------	------

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

SNAKEBITE YEAR 9

Snakebite has produced variable yields in Canterbury. It is relatively susceptible to a most diseases. Snakebite has stiff straw strength, early to intermediate maturity, good grain weight and above average proteins.

RELATIVE YIELDS – 4 year adjusted mean
(% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately susceptible
Net blotch	Mostly susceptible
Leaf rust	Mostly susceptible
Powdery mildew	Moderately susceptible

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	46	50
Test weight (kg/hl)	61	62
Protein (%) (N% x 6.25)	9.9	8.9
Screenings (%)	1.4	1.8

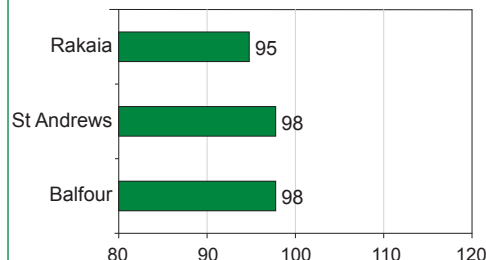
END USE	Feed
---------	------

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Ravensdown

SUMIT YEAR 6

Sumit is a below average yielding feed cultivar. It is susceptible to most diseases, so needs monitoring. A stiff strawed, short to medium height variety. Early to intermediate maturity with average grain quality characteristics.

RELATIVE YIELDS – 4 year adjusted mean
(% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately susceptible
Net blotch	Moderately susceptible
Leaf rust	Moderately susceptible
Powdery mildew	Moderately susceptible

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short-Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	44	46
Test weight (kg/hl)	60	61
Protein (%) (N% x 6.25)	9.3	8.5
Screenings (%)	2.5	3.2

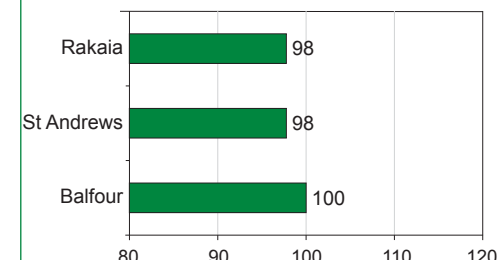
END USE	Feed
---------	------

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Seed Production

TAVERN YEAR 13

Average to below average yielding feed cultivar. Moderately resistant to scald and powdery mildew. Monitor for net blotch and leaf rust. Excellent straw strength combined with short to moderate crop height.

RELATIVE YIELDS – 4 year adjusted mean
(% of site mean yield)**DISEASE RESISTANCE**

Scald	Moderately resistant
Net blotch	Moderately susceptible
Leaf rust	Mostly susceptible
Powdery mildew	Moderately resistant

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short-medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	43	46
Test weight (kg/hl)	61	63
Protein (%) (N% x 6.25)	9.3	8.5
Screenings (%)	2.0	3.1

END USE	Feed
---------	------

BACKGROUND

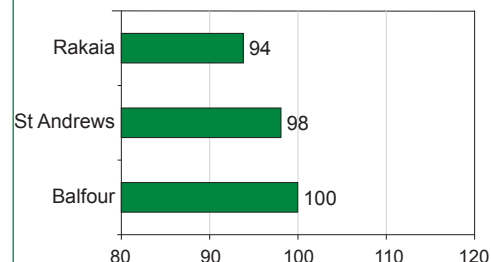
Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

CRBA 146

YEAR 2

A cultivar producing below average to average yields in its second year of CPT 2 trials. Shows good resistance to most diseases, with the exception of leaf rust. A medium height feed variety with intermediate maturity.

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



DISEASE RESISTANCE

Scald	Moderately resistant
Net blotch	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Mostly resistant

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	47	47
Test weight (kg/hl)	59	63
Protein (%) (N% x 6.25)	9.6	8.3
Screenings (%)	1.5	2.2

END USE	Feed
---------	------

BACKGROUND

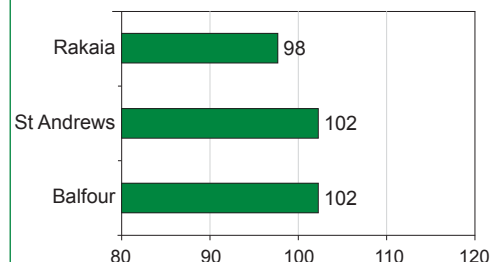
Breeder	Sejet
Head Licensee	Plant and Food Research
Agent	Luisetti Seeds

SYN413-345

YEAR 1

A new feed variety which has produced below average to above average yields. Moderately susceptible to leaf rust, but shows resistance to other diseases. An early maturing cultivar with a moderate to stiff straw and producing low proteins.

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



DISEASE RESISTANCE

Scald	Moderately resistant
Net blotch	Moderately resistant
Leaf rust	Moderately susceptible
Powdery mildew	Mostly resistant

FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Short-medium
Maturity	Early

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	46	47
Test weight (kg/hl)	61	59
Protein (%) (N% x 6.25)	7.6	8.2
Screenings (%)	0.5	3.0

END USE	Feed
---------	------

BACKGROUND

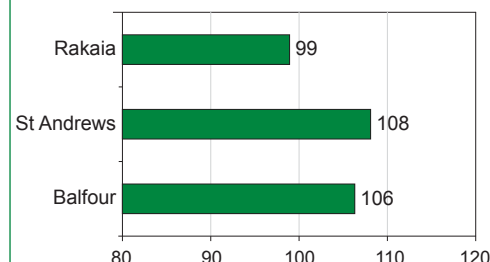
Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

SYN413-347

YEAR 2

A feed variety with high yields in South Canterbury and Southland under dryland conditions. Shows varying levels of resistance to net blotch and powdery mildew, but is moderately susceptible to scald and leaf rust. An early to intermediate maturing cultivar with a moderate to stiff straw.

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



DISEASE RESISTANCE

Scald	Moderately susceptible
Net blotch	Intermediate resistance
Leaf rust	Moderately susceptible
Powdery mildew	Mostly resistant

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Canty	Sthld
TGW (g)	45	51
Test weight (kg/hl)	56	59
Protein (%) (N% x 6.25)	8.9	8.4
Screenings (%)	1.5	2.4

END USE	Feed
---------	------

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

Autumn sown wheat and barley – Sowing date guidelines 2017

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	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Inferno (KWW47)	■	■	■	■	■			
Ruapuna (CRWT227)	■	■	■	■	■			
Resolution (PRL-954)	■	■	■	■	■			
Torch	■	■	■	■	■			
Reflection (SYN11978)	■	■	■	■	■			
Gator	■	■	■	■	■	■		
Ignite (KWW59)	■	■	■	■	■	■		
Claire	■	■	■	■	■	■		
Starfire (KWW46)	■	■	■	■	■	■		
Wakanui	■	■	■	■	■	■		
CRWT233	■	■	■	■	■	■		
Graham (CM159)	■	■	■	■	■	■		
Richmond	■	■	■	■	■	■		
Excede	■	■	■	■	■	■		
Empress	■	■	■	■	■	■		
Conqueror	■	■	■	■	■	■		
Duchess (CRWT207)	■	■	■	■	■	■		
Hanson (CRWT204)	■	■	■	■	■	■		
CRWT218	■	■	■	■	■	■		
Saracen	■	■	■	■	■	■		
Viceroy	■	■	■	■	■	■		
Discovery (KWM31)	■	■	■	■	■	■		
Reliance (CRWT185)	■	■	■	■	■	■		
Raffles	■	■	■	■	■	■		
Conquest	■	■	■	■	■	■		

BARLEY	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT
Tavern		■	■	■	■	■	■	■
CRBA146		■	■	■	■	■	■	■
Scholar (SY411-285)		■	■	■	■	■	■	■
Piper (SY411-287)		■	■	■	■	■	■	■
Sumit		■	■	■	■	■	■	■
SY413-347		■	■	■	■	■	■	■
SY413-345		■	■	■	■	■	■	■
Sanette		■	■	■	■	■	■	■
Laureate (SY412-328)		■	■	■	■	■	■	■
SY413-372		■	■	■	■	■	■	■
Calibre		■	■	■	■	■	■	■
Jimpy		■	■	■	■	■	■	■
Garner		■	■	■	■	■	■	■
Snakebite		■	■	■	■	■	■	■
RGT Planet (SFR85-014)		■	■	■	■	■	■	■
Fortitude (CRBA144)		■	■	■	■	■	■	■
Shada (SY410-235)		■	■	■	■	■	■	■
Fairview		■	■	■	■	■	■	■
Milford		■	■	■	■	■	■	■

* Less information available for new cultivars.

1. The earlier part of each sowing window may be more suited to higher altitudes and southerly latitudes.

2. Barley cultivars at the late sowing window are more suited to irrigated, higher fertility sites.

3. Some spring barley cultivars are also included.

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 of the seed,
- the germination percentage (%) of the seed,
- the expected crop emergence – this is determined 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 thousand grain weight (TGW) should be available on the seed bag or on request. If you need to calculate it for 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.

1. If you have scales that will weigh to 0.1g, count 200 seeds, weigh them and multiply the weight by 5 to get thousand grain weight
2. If not, count and weigh 1000 seeds.

GERMINATION PERCENTAGE (%)

This should also be on the bag label or on request. A purity & germination (P&G) test figure is usually quoted. Germination tests determine the maximum germination potential of a given seed line. Under certain conditions in the field it is often noted by producers that the laboratory germination result overestimates seedling emergence. Although there are many factors that may influence the final plant population, the observed differences are also a result of the physiological quality of a particular seed line and its tolerance to stress. Caution is advised as the germination figure does not equate to the percentage of seeds expected to emerge in the field.

EMERGENCE PERCENTAGE (%)

Emergence percentage 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 should hopefully be on request. Experience certainly helps when deciding on this figure.

Examples of emergence % could be:

- April sown: 90% emergence (assumes warm, moist conditions)
- May sown: 85% emergence
- June sown: 80% emergence
- July sown: 75% emergence (assumes maybe poorer quality seedbed, sown too deep, cold soil conditions).

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

Examples:

AUTUMN WHEAT

- A wheat sample TGW = 45g
- B % germination = 95%
- C % emergence = 90%
- D target plant population = 125pl/m²
- E required sowing rate is 66kg/ha

SPRING BARLEY

- A barley sample TGW = 40g
- B % germination = 90%
- C % emergence = 85%
- D target plant population = 225pl/m²
- E required sowing rate is 118kg/ha

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

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

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 % are figures that were known at drilling.

ISSUES FOR SUCCESSFUL ESTABLISHMENT (in no particular order)

NUTRITION AND MOISTURE: 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. 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.

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: Sown too shallow, seed may be subject to bird damage and susceptible to drying out. If sown too deep, young plants will struggle to emerge and may be weak and therefore prone to disease or may become deformed. Check that your drill is placing seed at its optimum depth.

TIME OF SOWING: Crops sown in the early autumn or late spring, when soil temperatures are warm and moisture is (hopefully) ideal, should mean rapid germination and a high emergence rate of seedlings. The autumn sown crops will also have more opportunity to tiller, so sowing rates will need to take this into account.

WEEDS, DISEASES AND PESTS: Weeds will compete with the crop for light, moisture and nutrients. Weeds may potentially 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, but 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.

SOWING RATES IN GENERAL FOR AUTUMN SOWINGS

Note: for most recent trial results relating to sowing rates for autumn sown wheat, see FAR Arable Update Cereals Nos. 60, 85 and 100.

Generally establishment targets are:

- April 100 plants/m²
- May 100-150 plants/m²
- June 200 plants/m²

Usually there is no real advantage of sowing more than 200 plants/m².

For further reading see FAR Arable Update Cereals numbers 15, 65, 66, and 81.

SEED QUALITY

High quality seed has:

- < 10% *Fusarium/Microdochium*;
- > 95% germination;
- > 40g TSW;
- low abnormals and;
- good vigour.

Attributes of example lines

Line	UNTREATED					TREATED			
	Germ	Abnorm	Remain	Fusari	Vigour	Germ	Abnorm	Remain	Fusari
A	80.2	13.8	6.0	36.0	3.2	76.6	18.0	5.4	2.8
B	73.6	17.0	9.4	31.0	2.8	69.4	21.4	9.2	0.6
C	72.0	14.6	13.4	71.2	3.6	71.4	4.4	6.4	3.6
D	79.6	13.8	6.6	5.0	3.8	71.6	22.0	6.4	0.0
E	83.8	9.2	7.0	21.0	4.4	79.4	11.8	8.8	0.2
F	76.6	17.6	5.8	62.6	3.8	71.4	23.4	5.2	6.2

Vigour 1 = poor, 5 = excellent

- A Reasonable line, *Fusarium* mostly controlled with treatment, abnormals increased slightly after treatment indicating some seed damage.
- B Reject, abnormals increased after treatment indicating some seed damage, vigour not sufficient, treated germination not sufficient.
- C Reject, *Fusarium* extremely high even though mostly controlled with treatment.
- D Reject, abnormals increased after treatment indicating some seed damage.
- E Reasonable line with good vigour.
- F Reject, *Fusarium* extremely high even though mostly controlled with treatment, however abnormals increased after treatment indicating some seed damage.

NOTE:

- It is suggested that 60% of abnormals will emerge. However be aware that these plants have low tillering capacity.
- Remainders are seeds which don't germinate.

PATHOGEN THRESHOLDS

Guidelines for seed-borne disease thresholds based on NIAB (UK) and NZ experiences:

- If < 10% *Fusarium/Microdochium* or 5% *Drechslera* infection sow untreated seed before 1 May or after 1 October.
- Treat if sowing after 1 May or before 1 October.
- All seed should be treated if the cereal follows maize as *Fusarium* risk is higher.
- A zero threshold exists for loose smut and barley seed-borne mosaic virus. Seedlines with loose smut will be rejected from certification and uncertified seed must be treated.

Seed treatments may not be needed on high quality seed (*seed quality details should be freely available from seed merchant*) and if the seedline is not repeatedly sown without treatment.

SEED TREATMENT STRATEGIES**AUTUMN WHEAT STRATEGY:**

1. If sowing in April with high quality seed into a warm seedbed that is not too wet – no treatment needed.
2. If sowing in April and require *Fusarium* control only (i.e. >10%) – consider using Vitaflo®, Raxil®, or MBC.
3. If sowing in April and require protection from soil or seed-borne diseases – consider using Vitaflo.
4. If sowing in April and early protection is required from stripe rust and soil-borne diseases – consider using Galmano® or Veteran®.
5. If sowing May/June, need protection from soil-borne diseases, have low *Fusarium* – consider using Vitaflo.

CONSIDERATIONS:

- In damaged (e.g. cracked) seed all products have the potential to reduce establishment and, in severe cases, yield. Raxil then Vitaflo are the least likely to delay emergence of damaged seed. Delayed emergence may be critical for late autumn sowings.

- Vitaflo or Raxil control low *Fusarium* levels but consider using MBC where levels are higher.
- Ideally, reject seedlines which test over 20-25% *Fusarium* and/or with a P&G germination of <85%. However, seasonal conditions will impact on availability of seed with these levels.
- Seed treatments do not reduce the incidence of *Fusarium* head blight in the crop.

INSECTICIDE

Imidacloprid and Poncho® are the only registered insecticide seed treatments providing some control of aphids and grass grub. They should provide control of aphids up until the plant reaches GS13/21 or as the first tiller is appearing. At this time the plant has grown enough that a dilution effect occurs. No matter what the sowing date, control should persist through until GS13/21 (unless heavy rain occurs). For spring sowings, Gaucho® would be used primarily for grass grub control, not aphids.

CONSIDERATIONS FOR INSECTICIDE SEED TREATMENT USE:

- For sowings before 1 May, a foliar aphicide should follow at GS13/21, then monitor the need for further foliar applications.
- For sowings after 1 May, the need for a foliar aphicide should be monitored after 6 weeks.
- The best use may be when both grass grub and early aphid protection are needed, when spraying is difficult or inconvenient, or to provide management flexibility.
- Growers need to closely look at the economics of insecticide seed treatment vs. foliar insecticides if only aphid control is required, especially if sowing is in April and further foliar aphicide applications are essential.

For conventional drilling dates the most cost effective autumn BYDV control is often a tank mix of insecticide with autumn herbicides (at GS13) unless the disease risk was severe before GS13 (3 true leaves), or grass grub control was also required.

4 year adjusted mean

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.

CV%

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.

Falling number

An indicator of sprouting if scores are low, falling number (FN) is an indirect measure of alpha-amylase levels in the grain with low FN indicating high alpha-amylase activity. FAR do not test falling number on feed wheat, only milling wheats.

Limited data

For newer cultivars which 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 ().

LSD

The “Least Significant Difference”, or LSD, 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.

Protein %

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 %.

Relative yield

Yields relative to a base 100 are given where 100 is the average yield across all cultivars. These relative yields make it easier to compare sites which may differ widely in mean yields.

Screenings %

Percentage of small grains, weed seeds and foreign matter which pass through a 2.0 mm rotoscreen.

Test weight

Measured in kilograms per hectolitre (kg/hl), test weight is an indication of grain density. Test weight is reported at a standard grain moisture of 14%.

TGW

Thousand grain (seed) weight, reported in grams (g). Grain size is needed both as a measure of grain quality and for calculating sowing rates.

***Fusarium* head scab**

Disease caused by *Fusarium* spp.

Leaf rust

Disease caused by *Puccinia recondite* f.sp. *tritici*.

Powdery mildew

Disease caused by *Erysiphe graminis* f.sp. *tritici*.

Septoria tritici blotch (STB)

Disease caused by *Zymoseptoria tritici*, (perfect stage *Mycosphaerella graminicola*)

Stripe rust

Disease caused by *Puccinia striiformis* f.sp. *tritici*.

The table below is for you to record your cultivar choice and other useful information for your paddock history.

An example is provided.

[illegible]

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

HOST FARMERS:

Andrew Brooker
Ashley Biggs
Bevan and Graham Lill
Craig Collins
David Grant
Douglas Giles
Earl Dillon
Eric Watson
Geoff Maw
Murray Turley
Nick Porter
Nick Ward
Robbie Clarke
Ross Hewson

TRIAL OPERATORS:

Andy Hay	Plant & Food Research
Bede McCloy	New Zealand Arable
John van den Bosch	PGG Wrightson Grain
Kevin Sinclair	Plant & Food Research
Matthew Hicks	Cropmark Seeds Ltd
Paul Bowater	Plant Research (NZ) Ltd
Stewart Armstrong	Plant & Food Research

GRADING TESTS:

Jenny Sutherland PGG Wrightson Seeds

BIOMETRICIAN:

David Baird VSN NZ Ltd

CONTRIBUTING SCIENTISTS:

Catherine Munro	Plant & Food Research
Soonie Chng	Plant & Food Research

FINANCIAL CONTRIBUTORS:

FAR levy payers
New Zealand Flour Millers Association
New Zealand Grain & Seed Trade Association (NZGSTA)

GRAPHIC DESIGNER:

Melissa Hillmer BNS Design & Print

BOOKLET PRODUCTION:

Anna Heslop	Foundation for Arable Research
Rachel Currie	Foundation for Arable Research
Rob Craigie	Foundation for Arable Research
Tabitha Armour	Foundation for Arable Research

