



ADDING VALUE TO THE BUSINESS OF ARABLE FARMING™

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



FOUNDATION FOR ARABLE RESEARCH



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wheat and barley
2014/2015**

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The spring series of cereal cultivar trials has again confirmed the high yield performance of cultivars entering the system over the past two years. The six top performing spring feed barley cultivars yielded an average of 11 t/ha or above across all of the Canterbury trials in the 2014-15 season. These included Sanette and Kelim plus four pre-commercial cultivars. The new bread wheat cultivar Discovery (KWM31) was again the highest yielding in the Canterbury spring sown wheat trials, with an average yield of 11.7 t/ha.

Remember that four year yield data is much more robust than one year data. The more trials a cultivar has been in, the more confidence can be taken from its reported performance. This is demonstrated in the four year yield tables. The least significant difference (LSD) is used to test whether or not the difference between two cultivars is significant. The difference in yield between two cultivars must be greater than the LSD for those two cultivars to be proven different statistically. When comparing two established cultivars, the LSD is lower

than when comparing first year cultivars with established ones. For example, for the Canterbury spring barley four year means, the LSD for established cultivars is 4.7 compared with 7.4 for new cultivars.

For example, the pre-commercial cultivar SFR85-014, which is in its first year in trials, had the highest yield in Canterbury at 106 of the mean yield, but because its LSD is 7.4 that yield is not considered to be significantly higher than Tavern at 99. Although, Sanette yielded lower at 104, its yield is considered to be significantly higher than Tavern because after three years of trials it is an established cultivar with an LSD of 4.7.

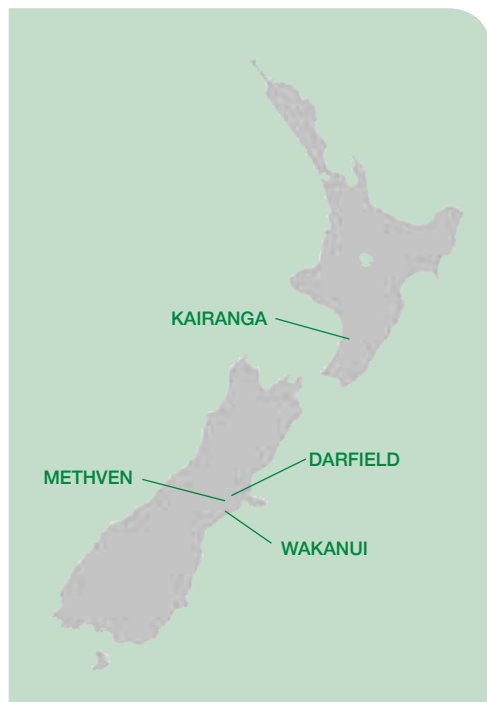
FAR welcomes any queries or suggestions to further improve these booklets, or if you require any additional information that we have not included please contact us.

Rob Craigie
Research Manager

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2014/2015 trial site location map

KAIRANGA-MANAWATU

Kairanga silt loam, Dryland
Trial operator: Kevin Sinclair,
 Plant & Food Research
Host farmer: Brian and Mark Saunders

This dryland trial was sown into a crop of Raffles on 4 November 2014 following maize. The trial received 100 kg/ha urea in January. Two herbicides and fungicides were applied between December and January. No PGR or insecticides were applied. The trial established well and was harvested on 18 March 2015.

DARFIELD - CENTRAL CANTERBURY

Lismore silt loam, Irrigated
Trial operator: Andy Hay,
 Plant & Food Research
Host farmer: John Redmond

Sown into a paddock of Conquest on 28 August 2014, this trial followed potatoes. A total of 200 kg N/ha was applied in three split applications. Three herbicides were applied to control volunteer potatoes and grass weeds. The trial received a PGR, two foliar insecticides and two applications of fungicide. 30 mm of irrigation was applied weekly during the growing season providing around 400 mm of irrigation in total to the crop. Harvest occurred on 19 February 2015.

METHVEN - MID CANTERBURY

Lismore stony silt loam, Irrigated
Trial operator: Steve Shorter,
 PGG Wrightson Grain
Host farmer: Craige Mackenzie

The trial was sown on 4 September 2014 in a crop of Discovery, following pasture. Three applications of urea totalling 425 kg/ha were applied between October and December. Three herbicides, two insecticides and a PGR were applied during September to December. The trial received 300 mm of irrigation during the growing season, but supply was restricted during late December to early January. The trial was harvested on 1 March 2015.

WAKANUI - MID CANTERBURY

Wakanui silt loam, Irrigated
Trial operator: Andy Hay,
 Plant & Food Research
Host farmer: Eric Watson

Sown in a surrounding crop of Discovery on 22 August 2014, this trial followed radish. The trial received three applications of urea totalling 230 kg N/ha. Three herbicide applications, two foliar insecticides and two PGRs were applied between October and November, along with three fungicide applications. The trial received five applications of irrigation totalling 200 mm. Some minor lodging was recorded at harvest on 10 March 2015.

Spring Sown Wheat Agronomic Comment 2014/2015 Season

CULTIVAR	Years in FAR trials	BYDV Scores	Septoria leaf blotch	Stripe rust	Leaf rust	Powdery mildew	Fusarium head blight ¹	Straw strength	Crop height	Maturity	Sprouting susceptibility
Conquest	12	MRMS	MR	MR	MSS*	MS	MS	Mod-stiff	Medium	Early-int	Low
Discovery (KWM31)	2	(MS)	(MR)	(MRMS)	(R)	(MR)	(MR)	Stiff	Tall	Intermediate	Low-mod
Morph	14	MS	MS	MRR	MS*	R	MR	Weak-mod	Medium	Intermediate	Low
Raffles	13	MS	MR	MSS	MSS	MR	MS	Moderate	Tall	Intermediate	Low
Reliance (CRWT185)	3	MRMS	MS	MR	(MSS)	(MSS)	(MS)	Mod-stiff	Short-med	Early-int	Low
Sage	9	(MS)	MR	MSS	MR	MRR	MR	Weak-mod	Tall	Int-late	Low
Saracen	5	(MS)	MR	MR	MSS	MR	MS	Stiff	Short	Intermediate	Low
Sensas	5	(MS)	MS	(MR)	MRR	(MR)	(MS)	Stiff	Medium	Early	Low
Viceroy (CRWT151)	5	(MR)	MS	MR	MS	MS	(MSS)	Stiff	Med-tall	Intermediate	Low-mod

¹ Fusarium head blight ratings are based on limited data because of infrequent infections. 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. 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

CULTIVAR	Kairanga	Darfield	Methven	Wakanui	Canterbury mean yield	Seasons in FAR trials (Spring sown)
Region	Manawatu	Central Canterbury	Mid Canterbury	Mid Canterbury		
Soil type	Kairanga silt loam	Lismore silt loam	Lismore stony silt loam	Wakanui silt loam		
Dryland / Irrigated	Dryland	Irrigated	Irrigated	Irrigated		
Previous crop	Maize	Potatoes	Pasture	Radish		
Sow date	4 Nov	28 Aug	4 Sep	22 Aug		
Harvest date	18 Mar	19 Feb	1 Mar	10 Mar		
Conquest	6.9	9.7	9.3	12.5	10.5	12
Discovery (KWM31)	8.3	10.7	9.9	14.5	11.7	2
Morph	7.9	11.3	9.1	13.6	11.3	14
Raffles	8.7	9.9	9.2	14.4	11.1	13
Reliance (CRWT185)	6.4	9.9	9.6	12.6	10.7	3
Sage	8.3	10.4	9.1	14.1	11.2	9
Saracen	7.3	9.6	8.7	12.1	10.1	5
Sensas	7.5	9.8	9.5	12.5	10.6	5
Viceroy (CRWT151)	8.2	10.6	9.5	13.3	11.1	5
Site mean yield (t/ha)	7.7	10.3	9.2	13.4	10.9	
LSD 5%	0.8	0.6	0.3	0.5	0.8	
CV%	7.3	3.8	2.7	2.4	4.4	

Spring Sown Wheat Grain Quality Data 2014/2015 Season

Southern North Island

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)
Conquest	38	76	12.9	2.2	424
Discovery (KWM31)	41	73	11.8	1.7	324
Morph	39	73	11.5	2.3	317
Raffles	45	75	12.0	1.6	378
Reliance (CRWT185)	40	74	13.0	2.0	369
Sage	45	75	12.8	1.7	331
Saracen	40	74	11.9	1.6	359
Sensas	41	81	12.0	1.5	357
Viceroy (CRWT151)	38	79	12.6	2.4	402
Mean	41	75	12.3	1.9	362
LSD 5%*	-	-	-	-	-

* No LSD available since only one site in the North Island, therefore only one data value per cultivar.

Canterbury

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 5.7)	Screenings (%)	Falling No. (seconds)
Conquest	40	76	13.6	1.5	394
Discovery (KWM31)	49	75	12.5	1.0	351
Morph	38	70	12.4	2.0	382
Raffles	45	74	12.6	2.1	401
Reliance (CRWT185)	42	74	13.4	1.8	382
Sage	46	75	13.7	0.8	336
Saracen	42	73	12.2	2.0	358
Sensas	43	78	12.8	1.0	374
Viceroy (CRWT151)	42	80	12.9	1.9	393
Mean	43	75	12.9	1.6	375
LSD 5%	2.3	1.6	0.4	1.4	45

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

wheat - 4 year adjusted mean

CULTIVAR	Kairanga	Darfield	Methven	Wakanui	Canterbury mean yield	Seasons in FAR trials (Spring sown)
Region	Manawatu	Central Canterbury	Mid Canterbury	Mid Canterbury		
Dryland / Irrigated	Dryland	Irrigated	Irrigated	Irrigated		
No. of trials	3	4	4	4	12	
Conquest	92	94	96	93	94	12
Discovery (KWM31)	105	106	107	112	109	2
Morph	104	106	102	102	103	14
Raffles	108	101	104	108	105	13
Reliance (CRWT185)	95	100	100	95	98	3
Sage	107	98	97	103	100	9
Saracen	96	97	93	91	94	5
Sensas	92	94	101	96	97	5
Viceroy (CRWT151)	102	105	101	99	101	5
Site mean yield (t/ha)	100 (9.3)	100 (9.4)	100 (9.4)	100 (11.2)	100 (10.0)	
LSD (estab. cv)	7.7	8.3	5.3	3.6	5.8	
LSD (new vs estab.)	11.0	13.1	8.3	5.8	9.1	

For Kairanga, the atypical 2011/12 trial is excluded from the above mean, so it is a 3 year mean. 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. These 4 year adjusted mean relative yields are also presented in graphical form on the following pages for each individual cultivar.

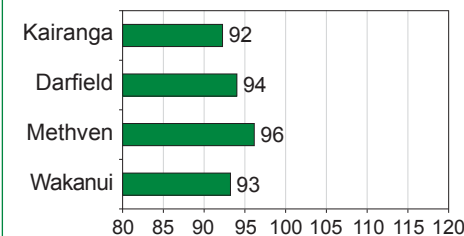
wheat cultivar descriptions

CONQUEST

YEAR 12

Conquest is a premium bread cultivar so tends to have lower yields than other cultivars. This cultivar has become mostly susceptible to leaf rust but is moderately resistant to septoria tritici blotch and stripe rust. Although grain weights are low, Conquest produces high test weights, proteins and falling numbers along with excellent sprout resistance.

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



DISEASE RESISTANCE

BYDV	Intermediate resistance
Septoria leaf blotch	Moderately resistant
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)	41	42	-	-	-
Test weight (kg/hl)	74	76	-	-	-
Protein (%) (N% x 5.7)	13.1	13.5	-	-	-
Falling number (sec)	399	374	-	-	-
Screenings (%)	1.3	0.8	-	-	-

END USE Premium bread

BACKGROUND

Breeder Agent	Plant & Food Research Luisetti Seeds
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Note: Kairanga are 3 year means.

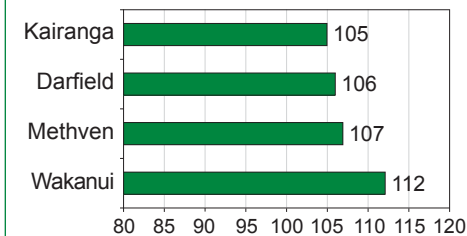
* Resistance is affected by pathotypes present (score is average).

DISCOVERY (KWM31)

YEAR 2

Highest yielding bread wheat cultivar in Canterbury for the second year, with above average yields in Southern North Island. Shows levels of resistance to most diseases apart from BYDV. Produces high grain weights but lower than average protein content and falling number. A tall stiff strawed variety with low to moderate sprouting risk.

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



DISEASE RESISTANCE

BYDV	Moderately susceptible
Septoria leaf blotch	Moderately resistant
Stripe rust	Intermediate resistance
Leaf rust	Resistant
Powdery mildew	Moderately resistant
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)	48	52	-	-	-
Test weight (kg/hl)	72	75	-	-	-
Protein (%) (N% x 5.7)	11.9	12.0	-	-	-
Falling number (sec)	298	349	-	-	-
Screenings (%)	1.3	0.4	-	-	-

END USE Bread

BACKGROUND

Breeder Agent	Limagrain Europe S.A. PGG Wrightson Grain
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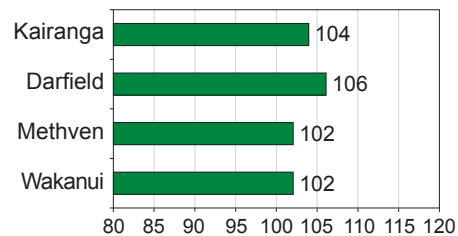
Note: Kairanga are 3 year means.

MORPH

YEAR 14

Above average yielding feed cultivar best sown June-August. Moderate susceptibility to BYDV, leaf rust and septoria tritici blotch but mostly resistant to stripe rust and powdery mildew. Morph has a low sprouting susceptibility with intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	41	40	-	-	-
Test weight (kg/hl)	71	70	-	-	-
Protein (%) (N% x 5.7)	11.1	11.4	-	-	-
Falling number (sec)	314	355	-	-	-
Screenings (%)	1.8	1.4	-	-	-

END USE Feed

BACKGROUND

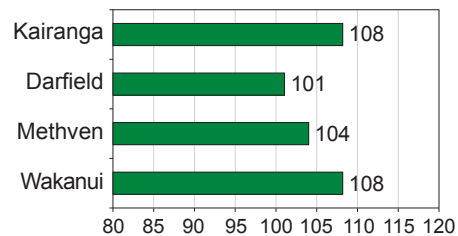
Breeder	Limagrains Europe S.A.
Agent	PGG Wrightson Grain

RAFFLES

YEAR 13

Above average yielding feed and gristing wheat. Good performer in southern North Island. Raffles is mostly susceptible to stripe rust and leaf rust, and moderately susceptible to BYDV and fusarium head blight. Moderately resistant to septoria tritici blotch and powdery mildew. Good grain weight, with low sprouting risk and a high falling number. A tall variety with intermediate maturity.

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



DISEASE RESISTANCE

BYDV	Moderately susceptible
Septoria leaf blotch	Moderately resistant
Stripe rust	Mostly susceptible
Leaf rust	Mostly susceptible
Powdery mildew	Moderately resistant
Fusarium head blight	Moderately 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)	48	49	-	-	-
Test weight (kg/hl)	69	74	-	-	-
Protein (%) (N% x 5.7)	11.7	11.8	-	-	-
Falling number (sec)	392	401	-	-	-
Screenings (%)	1.1	1.0	-	-	-

END USE Feed, gristing

BACKGROUND

Breeder	KWS, UK
Agent	Canterbury Seed

Note: Kairanga are 3 year means.

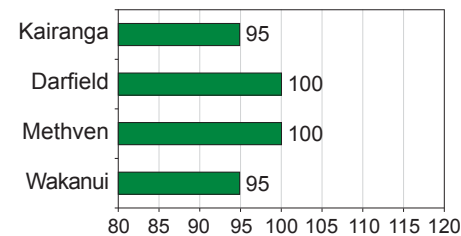
Note: Kairanga are 3 year means.
* Resistance is affected by pathotypes present (score is average).

RELIANCE (CRWT185)

YEAR 3

A New Zealand bred, premium grade bread cultivar with yields on average 4% higher than Conquest. Mostly susceptible to leaf rust and powdery mildew. Shows some resistance to BYDV and stripe rust. A moderate to stiff strawed cultivar producing good proteins with a low sprouting risk.

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



DISEASE RESISTANCE

BYDV	Intermediate resistance
Septoria leaf blotch	Moderately susceptible
Stripe rust	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Mostly 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)	44	44	-	-	-
Test weight (kg/hl)	73	74	-	-	-
Protein (%) (N% x 5.7)	12.8	13.1	-	-	-
Falling number (sec)	359	381	-	-	-
Screenings (%)	1.2	1.4	-	-	-

END USE Bread

BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds

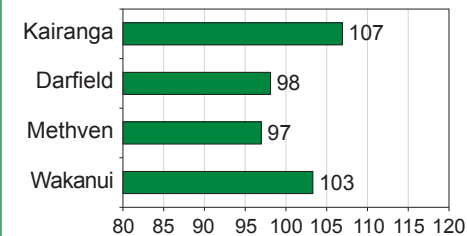
Note: Kairanga are 3 year means.

SAGE

YEAR 9

Sage is a medium grade bread wheat producing high yields in southern North Island, but average yielding in Canterbury. Moderately resistant to disease with the exception of stripe rust (mostly susceptible) and BYDV. Sage produces good proteins and grain weight. A longer straw with weak to moderate straw strength and needs a robust PGR programme. Low sprouting risk.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	50	49	-	-	-
Test weight (kg/hl)	74	75	-	-	-
Protein (%) (N% x 5.7)	12.3	13.0	-	-	-
Falling number (sec)	312	346	-	-	-
Screenings (%)	0.9	0.8	-	-	-

END USE Bread

BACKGROUND

Breeder	RAGT, UK
Agent	PGG Wrightson Grain

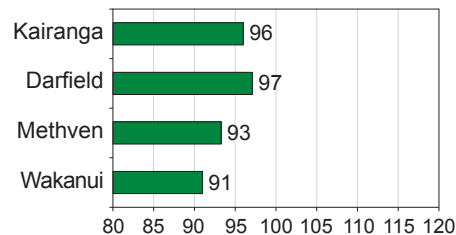
Note: Kairanga are 3 year means.

SARACEN

YEAR 5

A below average yielding medium grade bread wheat. Shows moderate resistance to septoria tritici blotch, stripe rust and powdery mildew. Saracen is mostly susceptible to leaf rust. Lower than average protein content. Saracen has excellent straw strength and low sprouting risk.

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



DISEASE RESISTANCE

BYDV	Moderately susceptible
Septoria leaf blotch	Moderately resistant
Stripe rust	Moderately resistant
Leaf rust	Mostly susceptible
Powdery mildew	Moderately resistant
Fusarium head blight	Moderately 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)	42	43	-	-	-
Test weight (kg/hl)	70	74	-	-	-
Protein (%) (N% x 5.7)	11.2	11.9	-	-	-
Falling number (sec)	325	361	-	-	-
Screenings (%)	1.3	1.4	-	-	-

END USE	Bread
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BACKGROUND

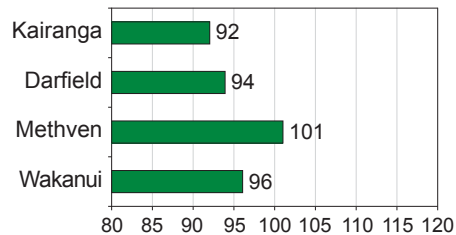
Breeder	Plant & Food Research
Agent	Luisetti Seeds

SENSAS

YEAR 5

Sensas is now the only true spring wheat cultivar in New Zealand. It is a medium grade bread wheat with average to below average yields. Good resistance to rusts and powdery mildew. Mostly average grain quality characteristics. This stiff strawed variety matures early with low sprouting risk. Due to its true spring character and early maturity it is well suited to late spring sowings but should not be planted before July to avoid frost risk at flowering.

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



DISEASE RESISTANCE

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

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)	47	45	-	-	-
Test weight (kg/hl)	78	78	-	-	-
Protein (%) (N% x 5.7)	12.4	12.5	-	-	-
Falling number (sec)	354	364	-	-	-
Screenings (%)	0.8	0.6	-	-	-

END USE	Bread
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BACKGROUND

Breeder	RAGT, France
Agent	PGG Wrightson Grain

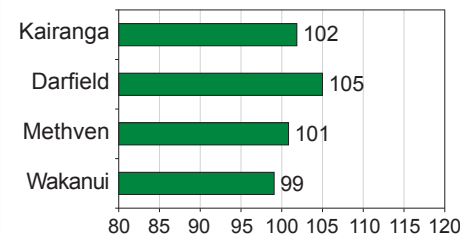
Note: Kairanga are 3 year means.

VICEROY (CRWT151)

YEAR 5

Viceroy is a New Zealand bred medium grade bread wheat with average yields. It shows susceptibility to most diseases with the exception of BYDV and stripe rust. It has a high test weight and falling number. This variety has a stiff straw with low to moderate sprouting risk.

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



DISEASE RESISTANCE

BYDV	Moderately resistant
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)	43	44	-	-	-
Test weight (kg/hl)	77	80	-	-	-
Protein (%) (N% x 5.7)	12.5	12.4	-	-	-
Falling number (sec)	392	396	-	-	-
Screenings (%)	1.4	1.1	-	-	-

END USE	Bread
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BACKGROUND

Breeder	Plant & Food Research
Agent	Luisetti Seeds

Note: Kairanga are 3 year means.



2014/2015 trial site location map

WANGANUI

Marion clay loam, Dryland
Trial operator: Kevin Sinclair,
 Plant & Food Research
Host farmer: Paul Mackintosh

This dryland trial was sown on 21 October 2014 into a field of Putney following a three year pasture phase. The trial received 150 kg/ha urea in late November. Two herbicide and fungicide applications and a foliar insecticide were applied in late November and December. No PGRs were used. The trial established well but late season lodging, affecting most cultivars, was recorded at harvest on 11 February 2015.

MARTON

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

The trial was sown on 22 October 2014 into a field of dryland Fairview following a Moata green feed crop. The trial received 24 kg N/ha in the form of CropZeal 16N at sowing. The trial received one application each of herbicide, fungicide and insecticide. No PGRs were used. The trial established well and was harvested on 13 February 2015.

OHOKA/CUST

Tai Tapu silt loam, Dryland
Trial operator: Matt Hicks,
 Cropmark Seeds Ltd
Host farmer: Tim Macfarlane

This new site replaces the previous Cust site. The trial was sown on 9 September 2014 into a field of dryland Bumpa following a previous barley crop. Three applications of urea totalling 400 kg/ha were applied to the trial. The trial also received three herbicides, two insecticides, one fungicide and a PGR. The crop was harvested on 23 February 2015.

DUNSANDEL

Templeton silt loam, Irrigated
Trial operator: Matt Hicks,
 Cropmark Seeds Ltd
Host farmer: Nigel Barnett

This trial was sown on the 25 September 2014 in a paddock of Quench following a three year pasture phase. The trial received 100 kg/ha urea in November. The trial received two herbicide and three fungicide applications and a foliar insecticide. No PGRs were used. A total of 270 mm of irrigation was applied in six applications. The trial was harvested on 23 February 2015.

METHVEN

Lyndhurst silt loam, Irrigated
Trial operator: John van den Bosch,
 PGG Wrightson Grain
Host farmer: Alan and Brendon Moore

The trial was sown on 22 August 2014 into a field of Cellar following kale. Urea totalling 230 kg/ha was applied in two applications. The crop received three herbicide applications, one foliar insecticide and a PGR in November. Four fungicides were applied between November and December. The trial received 140 mm irrigation in four applications. The trial established well, although some lodging and bacterial streak were noted at the end of the season. The trial was harvested on 12 February 2015.

PENDARVES

Lismore silt loam, Irrigated
Trial operator: Andy Hay,
 Plant & Food Research
Host farmer: Steve Pole

The trial was sown on 15 September 2014 into a field of barley following kale. The trial received a total of 220 kg/ha urea in two applications. Three herbicides, two insecticides, one fungicide and a PGR were applied during the growing season. A total of 68 mm irrigation was applied over four passes. The dry conditions meant that some cultivars may not have tillered to their true potential. The trial was harvested on 13 February 2015.

ST ANDREWS

Claremont clay loam, Irrigated
Trial operator: Andy Hay,
 Plant & Food Research
Host farmer: Nigel Rathgen

The trial was sown on 19 August 2014 into a field of Doyen following a three year pasture phase. A total of 400 kg/ha urea was applied in two applications. The trial received three herbicides, two insecticides, two fungicide mixes and a PGR. A total of 100 mm irrigation was applied during the growing season. The trial was harvested on 26 January 2015.

BALFOUR

Otama silt loam, Dryland
Trial operator: Stewart Armstrong,
 Plant & Food Research
Host farmer: Steve Wilkins

The trial was sown on 16 October 2014 into a field of Tavern following kale. The trial received one herbicide and two fungicides during the growing season. Debris from the previous crop led to establishment issues in some plots. The dry conditions forced premature ripening and some late season lodging was noted. The trial was harvested on 5 March 2015.

CHATTON

Waikoikoi silt loam, Dryland
Trial operator: Matt Hicks,
 Cropmark Seeds Ltd
Host farmer: John Gardyne

The trial was sown into a field of Tavern on 21 October 2014 following oats. 250 kg/ha urea was applied at sowing followed by two applications totalling 300 kg/ha and further variable rate applications of 100-200 kg/ha urea. The trial received two herbicides and a PGR. Two fungicide mixes were applied in early and late December. Some minor lodging and brackling was noted at harvest on 2 April 2015.

barley - agronomic comment

notes

CULTIVAR	Years in FAR trials	BYDV	Scald	Net form of net blotch	Leaf rust	Powdery Mildew	Straw strength	Crop height	Maturity
Booma	7	(MR)	MS	MR	MS	MR	Moderate	Med-tall	Early-int
Bumpa	8	MR	MS	MS	MR	MRR	Moderate	Med-tall	Early-int
Calibre	5	(MS)	MSS	(MR)	MS	(MR)	Moderate	Med-tall	Early-int
Chronicle	3	(MR)	(MR)	(MS)	(MSS)	Unknown	Mod-stiff	Med-tall	Intermediate
Dash	19	(MR*)	MSS	MS*	MR	Unknown	Stiff	Short	Early
Fairview	12	MS	MSS	MRR	MS*	HS	Moderate	Medium	Early-int
Flora	6	MS	(MSS)	MSS	MR	Unknown	Stiff	Medium	Intermediate
Garner	5	(MS)	MS*	(MR)	MS	(MR)	Stiff	Tall	Intermediate
Jimpy	8	(MR)	MR	MR	MS	MS	Mod-stiff	Medium	Int-late
Kelim (SYN409-202)	3	(MR)	(MS)	(MR)	(MS)	Unknown	Stiff	Tall	Intermediate
Liberator (CRBA133)	4	(MR)	(MS)	(MS)	(MS)	Unknown	Moderate	Medium	Intermediate
Milford	2	(MR)	(MS)	(MS)	(MRR)	Unknown	Stiff	Short	Intermediate
Putney	9	MR	MR	MS	MS	Unknown	Mod-stiff	Medium	Intermediate
Quench	9	MS	MR	MS	MSS	MRR	Stiff	Medium	Int-late
Sanette (SYN409-226)	3	(MS)	MR	(MR)	MS	Unknown	Moderate	Medium	Early-int
Snakebite	7	(MS)	MS	MSS	MS	MS	Stiff	Medium	Early-int
Sumit	5	(MS)	MS	MS	MS	(MS)	Stiff	Short-med	Early-int
Tavern	14	MS	MR	MS	MSS	MR*	Stiff	Short-med	Intermediate
CRBA140	2	(MS)	(MR)	(MR)	(MS)	Unknown	Moderate	Medium	Intermediate
CRBA144	1	(MR)	(MRR)	(MS)	(MR)	Unknown	Moderate	Medium	Intermediate
SFR85-014	1	(MS)	(MR)	(MS)	(MS)	Unknown	Moderate	Medium	Early-int
SYN410-235	2	(MSS)	(MSS)	(MS)	(MR)	Unknown	Moderate	Medium	Intermediate
SYN411-285	2	(MS)	(MS)	(MS)	(MR)	Unknown	Stiff	Medium	Int-late
SYN411-287	1	(MS)	(MS)	(MS)	(MS)	Unknown	Stiff	Medium	Intermediate
SYN411-291	1	(MS)	(MS)	(MR)	(MR)	Unknown	Moderate	Short	Int-late

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

Spring Sown Barley Cultivar Evaluation 2014/2015 Season - yield (t/ha)

CULTIVAR	Wanganui	Marton	Southern NI mean	Ohoka/Cust	Dunsandel		Methven	Pendarves	St Andrews	Canterbury mean	Balfour	Chatton	Southland mean	Seasons in FAR trial (Spring sown)
Region	Manawatu	Manawatu		North Canterbury	Mid Canterbury		Mid Canterbury	Mid Canterbury	South Canterbury					
Soil Type	Marton clay loam	Kiwitea silt loam		Tai Tapu silt loam	Templeton silt loam		Lyndhurst silt loam	Lismore silt loam	Claremont clay loam					
Dryland/Irrigated	Dryland	Dryland		Dryland	Irrigated		Irrigated	Irrigated	Irrigated					
Previous crop	Pasture	Green feed		Barley	Pasture		Kale	Kale	Pasture					
Sowing date	21 Oct	22 Oct		9 Sep	25 Sep		22 Aug	15 Sep	19 Aug					
Harvest date	11 Feb	11 Feb		23 Feb	23 Feb		12 Feb	13 Feb	26 Jan					
Booma	8.5	8.3	8.4	11.6	11.2		10.1	9.9	11.2	10.8	5.3	9.5	7.4	7
Bumpa*	-	-	-	-	-		-	-	-	-	-	-	-	8
Calibre	7.5	8.2	7.8	11.9	11.0		9.7	9.8	11.6	10.8	5.0	9.3	7.1	5
Chronicle	8.1	8.0	8.1	10.6	11.1		9.8	9.4	11.0	10.4	5.9	9.4	7.7	3
Dash	9.0	8.4	8.7	10.4	11.0		9.9	10.2	10.2	10.3	5.5	9.5	7.5	19
Fairview	8.0	8.1	8.1	10.8	10.7		8.9	9.6	10.8	10.2	-	-	-	12
Flora	7.9	8.2	8.1	11.3	11.3		8.9	9.6	10.5	10.3	5.4	9.1	7.3	6
Garner	8.5	8.1	8.3	11.4	10.7		9.9	10.2	11.1	10.6	5.6	9.4	7.5	5
Jimpy	7.1	8.2	7.6	10.7	10.9		9.5	9.4	10.9	10.3	-	-	-	8
Kelim (SYN409-202)	8.4	8.5	8.4	12.3	11.6		9.9	10.1	11.3	11.0	6.2	9.6	7.9	3
Liberator (CRBA133)	7.4	8.3	7.8	11.9	11.5		9.6	9.9	11.5	10.9	6.1	9.4	7.7	4
Milford	9.1	8.4	8.7	10.9	11.1		9.6	9.6	10.8	10.4	5.6	9.8	7.7	2
Putney	8.0	8.1	8.0	-	-		-	-	-	-	-	-	-	9
Quench	8.7	8.7	8.7	11.8	11.2		9.5	9.4	11.1	10.6	5.1	9.0	7.1	9
Sanette (SYN409-226)	9.4	9.0	9.2	12.3	11.6		9.7	10.1	11.6	11.1	6.2	10.1	8.2	3
Snakebite	8.6	8.1	8.3	10.9	11.0		9.9	10.2	11.0	10.6	5.9	9.0	7.4	7
Sumit	8.9	8.5	8.7	11.9	10.9		9.8	10.3	11.1	10.8	6.3	9.4	7.8	5
Tavern	7.2	7.3	7.3	11.0	10.9		9.8	9.8	10.7	10.4	5.6	9.1	7.4	14
CRBA140	8.5	8.3	8.4	11.5	10.6		9.9	9.2	11.5	10.6	5.8	9.0	7.4	2
CRBA144	9.3	9.2	9.3	11.2	11.3		10.7	10.3	11.7	11.0	5.7	9.9	7.8	1
SFR85-014	9.4	9.2	9.3	11.4	11.4		10.8	10.1	11.9	11.1	6.3	10.3	8.3	1
SYN410-235	9.2	9.2	9.2	11.3	11.4		9.3	10.2	11.4	10.7	6.3	9.5	7.9	2
SYN411-285	7.7	8.9	8.3	12.3	11.5		9.9	10.2	11.8	11.1	5.9	9.8	7.9	2
SYN411-287	9.3	8.9	9.1	12.3	11.1		10.0	10.2	11.6	11.0	6.0	10.2	8.1	1
SYN411-291	9.1	8.5	8.8	11.9	11.0		8.9	10.3	11.7	10.8	6.2	10.2	8.2	1
Site mean yield (t/ha)	8.5	8.4	8.4	11.5	11.1		9.7	9.9	11.2	10.7	5.8	9.5	7.7	
LSD 5%	0.6	0.3	0.7	0.7	0.5		0.6	0.6	0.4	0.5	0.9	0.6	0.6	
CV%	5.0	2.2	4.2	4.4	3.2		4.1	4.5	2.5	3.8	10.7	4.5	3.6	

- Cultivar not included in that particular trial.

* Bumpa withdrawn from trials due to establishment issues.

Note: No PGR applied to Wanganui trial and considerable lodging recorded.

Spring Sown Barley Grain Quality Data 2014/2015 Season

Southern North Island

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Booma	40	62	9.8	9.6
Bumpa*	-	-	-	-
Calibre	42	59	9.7	6.4
Chronicle	45	61	9.5	3.3
Dash	43	63	9.6	3.9
Fairview	47	62	9.6	4.2
Flora	46	59	9.2	4.0
Garner	43	60	9.5	7.8
Jimpy	42	59	10.0	6.2
Kelim (SYN409-202)	46	61	9.3	4.3
Liberator (CRBA133)	41	55	9.4	13.6
Milford	48	61	9.4	5.3
Putney	51	65	9.7	1.9
Quench	45	63	9.8	3.5
Sanette (SYN409-226)	47	61	9.1	1.9
Snakebite	50	63	9.4	1.3
Sumit	44	63	9.4	4.3
Tavern	50	67	10.7	1.9
CRBA140	51	65	10.6	1.9
CRBA144	45	62	9.4	3.8
SFR85-014	49	61	9.3	2.9
SYN410-235	48	61	8.9	6.1
SYN411-285	43	59	9.2	9.2
SYN411-287	48	60	9.1	2.5
SYN411-291	48	59	9.6	3.0
Mean	46	61	9.5	4.7
LSD 5%	3	3	0.6	6.0

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

* Bumpa removed due to establishment issues.

- Cultivar not included at this site.

Canterbury

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Booma	46	66	10.7	3.1
Bumpa*	-	-	-	-
Calibre	48	64	10.8	2.4
Chronicle	49	64	10.4	1.6
Dash	45	64	11.2	3.7
Fairview	47	65	11.0	2.0
Flora	52	64	10.6	2.0
Garner	48	64	10.7	2.5
Jimpy	48	66	11.2	1.8
Kelim (SYN409-202)	50	64	10.7	1.6
Liberator (CRBA133)	49	64	10.3	2.6
Milford	48	63	10.6	2.8
Putney	-	-	-	-
Quench	48	65	11.0	1.9
Sanette (SYN409-226)	50	63	10.5	1.6
Snakebite	53	65	11.0	1.2
Sumit	49	64	10.6	1.9
Tavern	48	66	10.7	2.0
CRBA140	51	67	11.5	1.1
CRBA144	50	65	10.9	1.2
SFR85-014	51	64	10.3	1.5
SYN410-235	48	61	10.0	3.9
SYN411-285	47	64	10.5	2.1
SYN411-287	53	63	10.5	1.6
SYN411-291	50	61	10.3	2.1
Mean	49	64	10.7	2.1
LSD 5%	2	1	0.3	0.7

Southland

CULTIVAR	T.G.W. (g)	Test Weight (kg/hl)	Protein (%) (N% x 6.25)	Screenings (%)
Booma	44	63	12.6	8.2
Bumpa*	-	-	-	-
Calibre	48	62	12.8	6.5
Chronicle	49	63	11.9	2.7
Dash	45	62	12.8	5.8
Fairview	-	-	-	-
Flora	51	62	12.5	3.1
Garner	50	63	12.7	3.7
Jimpy	-	-	-	-
Kelim (SYN409-202)	50	63	12.5	2.8
Liberator (CRBA133)	47	61	11.8	6.7
Milford	49	63	12.1	3.3
Putney	-	-	-	-
Quench	49	63	13.3	2.9
Sanette (SYN409-226)	51	61	12.1	2.8
Snakebite	48	63	10.6	3.7
Sumit	48	63	12.2	3.5
Tavern	47	65	12.9	4.0
CRBA140	51	66	13.8	1.4
CRBA144	48	62	12.8	2.6
SFR85-014	52	61	11.7	2.5
SYN410-235	48	60	11.6	5.9
SYN411-285	47	62	11.9	4.4
SYN411-287	53	62	12.1	2.1
SYN411-291	51	61	11.9	2.0
Mean	49	62	12.3	3.8
LSD 5%	4	2	1.4	4.4

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

* Bumpa removed due to establishment issues.

- Cultivar not included at this site.

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

CULTIVAR	Wanganui	Marton	Southern NI mean	Cust	Dunsandel		Methven	Pendarves	St Andrews	Canterbury mean	Balfour	Chatton	Southland mean	Seasons in FAR trials (Spring sown)
Region	Manawatu	Manawatu		North Canterbury	Mid Canterbury		Mid Canterbury	Mid Canterbury	South Canterbury					
Dryland / Irrigated	Dryland	Dryland		Irrigated	Irrigated		Irrigated	Irrigated	Irrigated					
No. of trials	4	4	8	3	4		4	4	3	18	4	3	7	
Booma	99	98	99	102	100		101	99	98	100	93	95	94	7
Bumpa*	101	95	98	97	99		103	99	98	99	102	101	101	8
Calibre	92	97	94	103	99		96	98	102	99	97	99	98	5
Chronicle	99	98	98	103	98		99	102	100	100	101	102	101	3
Dash	100	98	99	98	98		98	102	90	97	97	96	97	19
Fairview	91	93	92	94	92		92	92	93	92	-	-	-	12
Flora	96	99	97	92	100		90	97	93	94	93	95	94	6
Garner	99	100	99	100	99		103	101	99	100	96	97	97	5
Jimpy	90	94	92	96	99		97	92	95	96	-	-	-	8
Kelim (SYN409-202)	99	102	101	100	100		103	102	100	101	102	103	103	3
Liberator (CRBA133)	99	103	101	100	101		94	100	101	99	105	98	101	4
Milford	104	96	100	100	102		101	99	98	100	98	96	97	2
Putney	97	97	97	-	-		-	-	-	-	-	-	-	9
Quench	101	101	101	100	99		100	98	99	99	95	96	96	9
Sanette (SYN409-226)	102	105	104	108	105		102	105	101	104	105	106	106	3
Snakebite	100	93	97	100	100		102	100	97	100	99	94	96	7
Sumit	101	101	101	105	100		99	103	100	101	101	100	100	5
Tavern	91	88	90	101	97		103	98	95	99	101	95	98	14
CRBA140	97	99	98	102	100		103	94	108	101	99	99	99	2
CRBA144	110	111	110	-	101		110	104	105	105	99	103	101	1
SFR85-014	111	110	111	-	102		110	102	108	106	106	107	107	1
SYN410-235	109	109	109	98	106		99	105	101	102	99	103	101	2
SYN411-285	95	108	101	103	106		102	105	108	105	106	103	104	2
SYN411-287	109	106	108	-	100		102	103	104	102	102	106	104	1
SYN411-291	108	100	105	-	99		92	104	105	100	105	106	106	1
Site mean yield (t/ha)	100 (8.6)	100 (7.4)	100 (8.0)	100 (8.6)	100 (9.9)		100 (10.2)	100 (9.5)	100 (9.4)	100 (9.5)	100 (7.7)	100 (10.4)	100 (9.0)	
LSD (estab. cv)	7.6	5.8	8.7	7.0	4.8		6.8	6.6	5.7	4.7	8.0	6.3	5.5	
LSD (new vs estab)	12.0	9.1	13.8	9.9	7.6		10.7	10.5	8.0	7.4	12.7	8.9	8.6	

- Cultivar not included at that particular site.

* Bumpa withdrawn from the 2014-15 trials due to establishment issues.

Cust, St Andrews and Chatton are 3 year means. The Cust series excludes 2014-15 as it was dryland, whereas the previous seasons were irrigated.

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.

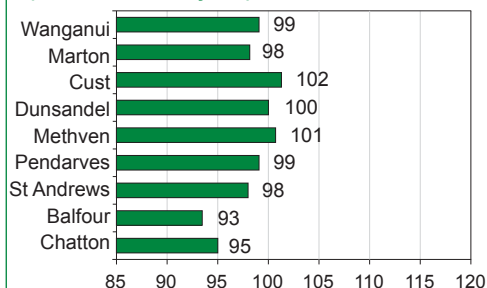
These 4 year adjusted mean relative yields are also presented in graphical form on the following pages for each individual cultivar.

BOOMA

YEAR 7

Booma has produced yields that range from below average in Southland to mostly average at other sites. This cultivar has shown moderate susceptibility to leaf rust and scald but moderate resistance to BYDV, net blotch and powdery mildew. Low thousand grain weights but good test weights. Booma is a medium to tall variety with moderate straw strength.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	46	46	46		
Test weight (kg/hl)	63	64	63		
Protein (%) (N% x 6.25)	9.4	10.1	11.6		
Screenings (%)	4.4	3.3	4.9		

END USE

Feed

BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

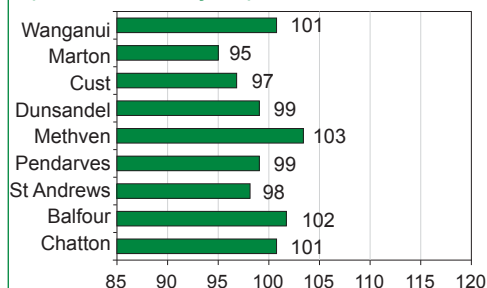
Note: Cust, St Andrews and Chatton are 3 year means.

BUMPA

YEAR 8

Bumpa is a feed cultivar which is mostly average yielding. Bumpa shows levels of resistance to powdery mildew, leaf rust, and BYDV, but is moderately susceptible to scald and net blotch. Bumpa has early to intermediate maturity with good test weights. Note that Bumpa was withdrawn from this season's trials due to establishment issues.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	49	51	54		
Test weight (kg/hl)	62	64	64		
Protein (%) (N% x 6.25)	9.3	10.5	11.5		
Screenings (%)	3.5	2.9	2.2		

END USE

Feed

BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

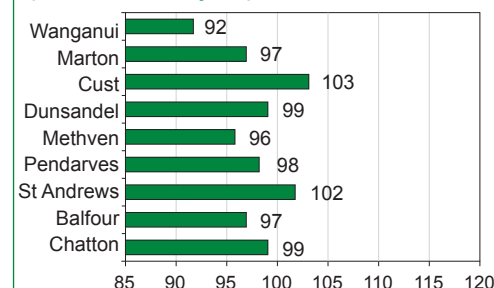
Note: Cust, St Andrews and Chatton are 3 year means.

CALIBRE

YEAR 5

Calibre has produced mostly average yields in Canterbury but below average in the southern North Island. This cultivar shows some resistance to net blotch and mildew but is susceptible to most other diseases. Calibre is a medium to tall variety with moderate straw strength.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	48	49	51		
Test weight (kg/hl)	61	63	62		
Protein (%) (N% x 6.25)	9.4	10.0	11.4		
Screenings (%)	3.9	2.3	4.3		

END USE

Feed

BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Canterbury Seeds Ltd

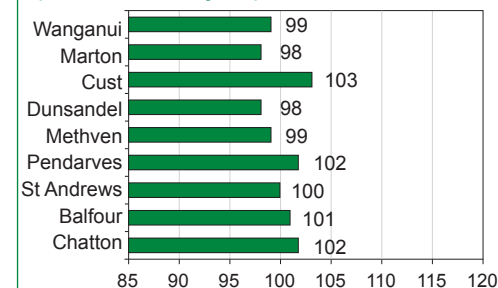
Note: Cust, St Andrews and Chatton are 3 year means.

CHRONICLE

YEAR 3

Chronicle is an average yielding feed cultivar with a mixed disease profile. It has moderate resistance to scald but is relatively susceptible to BYDV, leaf rust and net blotch. Moderate to stiff straw strength with intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	49	49	52		
Test weight (kg/hl)	63	63	61		
Protein (%) (N% x 6.25)	9.1	9.8	11.0		
Screenings (%)	2.0	1.6	2.5		

END USE

Feed

BACKGROUND

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

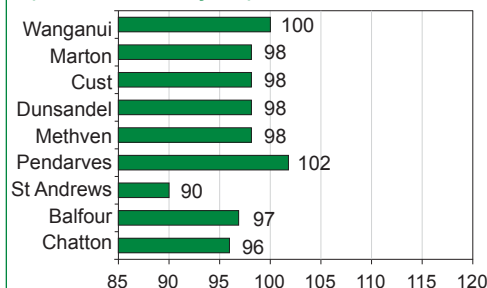
Note: Cust, St Andrews and Chatton are 3 year means.

DASH

YEAR 19

Dash is an early maturing feed cultivar with mostly below average yields. It has susceptibility to scald and net blotch but moderate resistance to BYDV and leaf rust. Produces low grain weights and above average proteins. A short stiff strawed cultivar with early maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short
Maturity	Early

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	47	45	46		
Test weight (kg/hl)	63	63	61		
Protein (%) (N% x 6.25)	9.4	10.7	11.6		
Screenings (%)	3.4	3.4	4.2		

END USE	Feed
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BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

Note: Cust, St Andrews and Chatton are 3 year means.

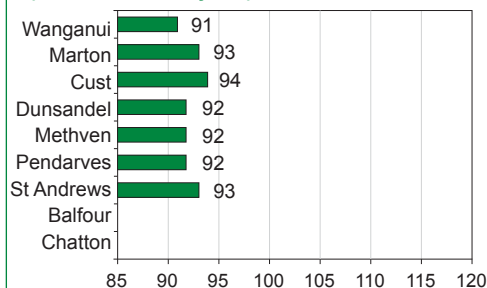
* Resistance is affected by pathotypes present (score is average).

FAIRVIEW

YEAR 12

Fairview is a below average yielding malting cultivar in Canterbury and southern North Island. Fairview is quite susceptible to mildew and scald and to a lesser extent BYDV and leaf rust. Mostly resistant to net blotch. Fairview has moderate straw strength and crop height.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	49	48	-		
Test weight (kg/hl)	63	64	-		
Protein (%) (N% x 6.25)	9.6	10.7	-		
Screenings (%)	3.1	2.0	-		

END USE	Malting
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BACKGROUND

Breeder	Malteurop
Head Licensee	Malteurop
Agent	Malteurop

Note: Cust and St Andrews are 3 year means.

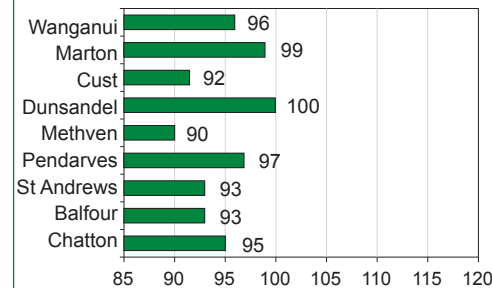
* Resistance is affected by pathotypes present (score is average).

FLORA

YEAR 6

Flora is a mostly below average yielding feed cultivar. Disease management programmes should account for scald and net blotch susceptibility as well as BYDV. Moderate resistance to leaf rust. Flora has above average grain weight with a stiff straw.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	51	52	53		
Test weight (kg/hl)	61	62	61		
Protein (%) (N% x 6.25)	9.0	9.9	11.1		
Screenings (%)	2.8	2.0	2.9		

END USE	Feed
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BACKGROUND

Breeder	Ackerman
Head Licensee	Plant Research Ltd
Agent	Cates Grain and Seed

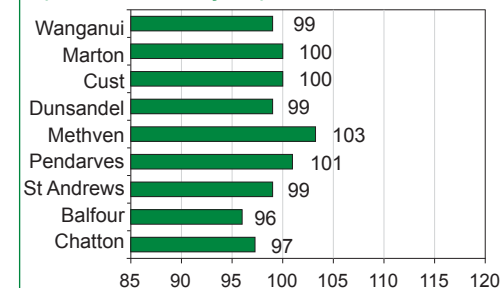
Note: Cust, St Andrews and Chatton are 3 year means.

GARNER

YEAR 5

Garner is a feed cultivar producing mostly average yields in Canterbury and southern North Island. Moderately susceptible to BYDV, scald and leaf rust. Moderately resistant to net blotch and powdery mildew. A medium to tall, stiff strawed variety with intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium-tall
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	50	49	51		
Test weight (kg/hl)	63	63	62		
Protein (%) (N% x 6.25)	9.3	9.9	11.3		
Screenings (%)	3.4	2.3	3.5		

END USE	Feed
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BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

Note: Cust, St Andrews and Chatton are 3 year means.

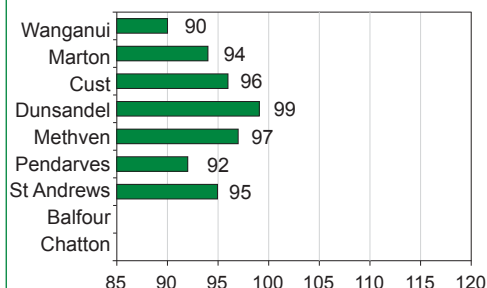
* Resistance is affected by pathotypes present (score is average).

JIMPY

YEAR 8

Jimpy is a malting cultivar with mostly below average yields. Jimpy has out-yielded Fairview by 4% in Canterbury. Has moderate resistance to BYDV, scald and net blotch but moderate susceptibility to leaf rust and powdery mildew. Medium height with intermediate to late maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

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

GRAIN QUALITY (4 year means) Sth Nth Is Canty Sthld

TGW (g)	49	48	-
Test weight (kg/hl)	63	64	-
Protein (%) (N% x 6.25)	9.7	10.5	-
Screenings (%)	2.8	1.8	-

END USE Malting

BACKGROUND

Breeder	Malteurop
Head Licensee	Malteurop
Agent	Malteurop

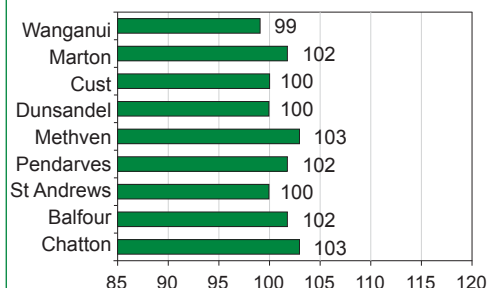
Note: Cust and St Andrews are 3 year means.

KELIM (SYN409-202)

YEAR 3

Kelim is a mostly average to above average yielding feed cultivar which performs well on dryland in Southland. Moderately resistant to BYDV and net blotch but moderately susceptible to scald and leaf rust. A tall variety with a stiff straw and large grain weight.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Tall
Maturity	Intermediate

GRAIN QUALITY (4 year means) Sth Nth Is Canty Sthld

TGW (g)	52	51	53
Test weight (kg/hl)	62	62	62
Protein (%) (N% x 6.25)	9.1	10.0	11.2
Screenings (%)	2.6	1.7	2.4

END USE Feed

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

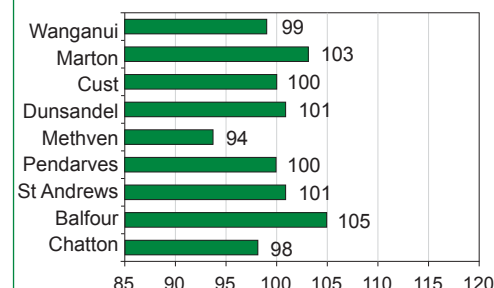
Note: Cust, St Andrews and Chatton are 3 year means.

LIBERATOR (CRBA133)

YEAR 4

Liberaor is a feed cultivar generally producing average yields. Moderately susceptible to leaf rust, scald and net blotch but moderately resistant to BYDV. Medium crop height combined with moderate straw strength.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means) Sth Nth Is Canty Sthld

TGW (g)	48	48	50
Test weight (kg/hl)	59	61	61
Protein (%) (N% x 6.25)	8.7	9.5	10.8
Screenings (%)	5.5	3.4	4.2

END USE Feed

BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

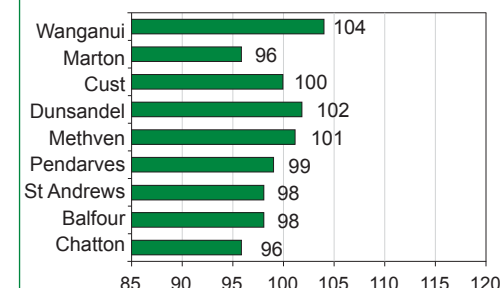
Note: Cust, St Andrews and Chatton are 3 year means.

MILFORD

YEAR 2

Milford, in its second year in CPT2, is producing mostly average yields. Moderately susceptible to net blotch and scald but shows levels of resistance to BYDV and leaf rust. A stiff short strawed variety with intermediate maturity and high screenings.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Short
Maturity	Intermediate

GRAIN QUALITY (4 year means) Sth Nth Is Canty Sthld

TGW (g)	52	49	50
Test weight (kg/hl)	62	62	60
Protein (%) (N% x 6.25)	9.3	10.1	11.5
Screenings (%)	2.7	3.5	3.6

END USE Feed

BACKGROUND

Breeder	Breun, Germany
Head Licensee	Canterbury Seed
Agent	Canterbury Seed

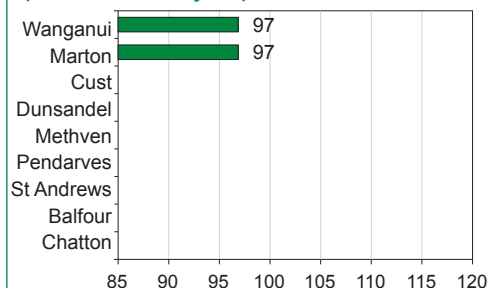
Note: Cust, St Andrews and Chatton are 3 year means.

PUTNEY

YEAR 9

Putney is a below average yielding feed cultivar in the southern North Island. Putney has shown moderate susceptibility to leaf rust and net blotch and moderate resistance to BYDV and scald. A moderate to stiff straw with intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate-stiff
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means) Sth Nth Is Cnty Sthld

TGW (g)	54	-	-
Test weight (kg/hl)	64	-	-
Protein (%) (N% x 6.25)	9.5	-	-
Screenings (%)	1.6	-	-

END USE

 Feed

BACKGROUND

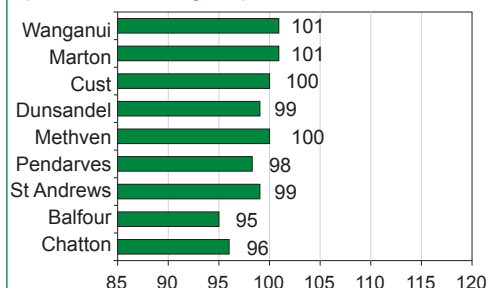
Breeder	Limagrain Europe S.A.
Head Licensee	PGG Wrightson Grain
Agent	PGG Wrightson Grain

QUENCH

YEAR 9

Quench is a mostly average yielding feed variety, but has produced below average yields in Southland. Good resistance to mildew and scald but the disease profile is weak against other foliar diseases especially leaf rust. Excellent standing power and medium crop height combined with intermediate-late maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate-late

GRAIN QUALITY (4 year means) Sth Nth Is Cnty Sthld

TGW (g)	50	48	50
Test weight (kg/hl)	63	63	62
Protein (%) (N% x 6.25)	9.4	10.3	11.8
Screenings (%)	2.3	2.1	2.8

END USE

 Feed, Malting potential

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain, Ruapehu Farm Supplies (NI)

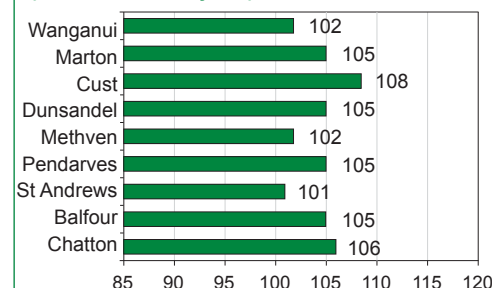
Note: Cust, St Andrews and Chatton are 3 year means.

SANETTE (SYN409-226)

YEAR 3

Sanette is an above average to high yielding feed cultivar with malting potential. Moderately resistant to scald and net blotch, and moderately susceptible to leaf rust and BYDV. An early to intermediate maturing variety with a moderate straw.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means) Sth Nth Is Cnty Sthld

TGW (g)	52	51	52
Test weight (kg/hl)	61	62	60
Protein (%) (N% x 6.25)	9.0	9.9	11.1
Screenings (%)	2.1	1.6	2.5

END USE

 Feed, Malting potential

BACKGROUND

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

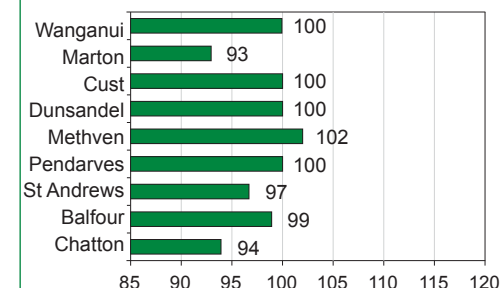
Note: Cust, St Andrews and Chatton are 3 year means.

SNAKEBITE

YEAR 7

Snakebite is a feed cultivar producing mostly average yields in Canterbury, but below average yields at some southern North Island and Southland sites. This variety is relatively susceptible to disease. Good grain weight with stiff straw and an early to intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means) Sth Nth Is Cnty Sthld

TGW (g)	54	53	53
Test weight (kg/hl)	62	63	62
Protein (%) (N% x 6.25)	9.4	10.7	11.3
Screenings (%)	1.5	1.4	2.4

END USE

 Feed

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Ravensdown

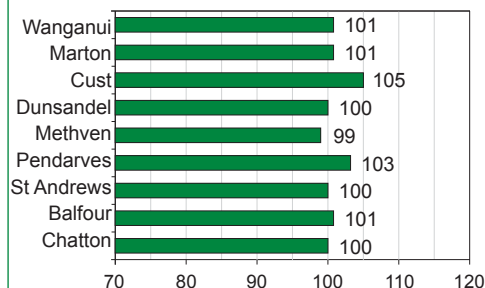
Note: Cust, St Andrews and Chatton are 3 year means.

SUMIT

YEAR 5

Sumit has produced average to above average yields. It is moderately susceptible to most diseases. This cultivar has stiff straw, short to medium crop height and is early to intermediate maturing.

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



DISEASE RESISTANCE

BYDV	Moderately susceptible
Scald	Moderately susceptible
Net form of 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)	Sth	Nth	Is	Canty	Sthld
TGW (g)	50	49	51		
Test weight (kg/hl)	63	63	60		
Protein (%) (N% x 6.25)	9.3	10.0	11.0		
Screenings (%)	2.9	2.2	3.5		

END USE	Feed
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BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Canterbury Seed

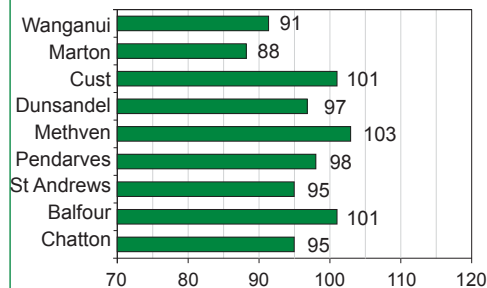
Note: Cust, St Andrews and Chatton are 3 year means.

TAVERN

YEAR 14

Tavern is a feed cultivar producing below average yields in the southern North Island, but with a more mixed performance at other sites. Moderately susceptible to the majority of diseases apart from scald and powdery mildew. Excellent straw strength combined with short to medium crop height.

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



DISEASE RESISTANCE

BYDV	Moderately susceptible
Scald	Moderately resistant
Net form of 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)	Sth	Nth	Is	Canty	Sthld
TGW (g)	52	49	51		
Test weight (kg/hl)	65	65	64		
Protein (%) (N% x 6.25)	10.0	10.3	11.3		
Screenings (%)	1.8	1.7	2.8		

END USE	Feed
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BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	PGG Wrightson Grain

Note: Cust, St Andrews and Chatton are 3 year means.

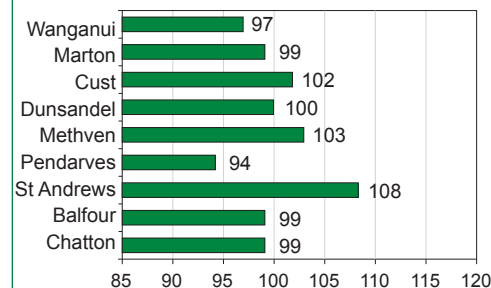
* Resistance is affected by pathotypes present (score is average).

CRBA140

YEAR 2

CRBA140 has produced yields varying from below average to high. Moderately susceptible to BYDV and leaf rust but shows moderate resistance to scald and net blotch. Excellent proteins and above average grain weights. A cultivar with moderate straw strength and intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	56	52	53		
Test weight (kg/hl)	65	66	64		
Protein (%) (N% x 6.25)	10.0	10.9	12.9		
Screenings (%)	1.0	1.0	1.6		

END USE	Feed
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BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

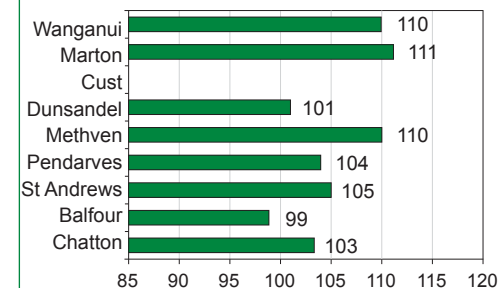
Note: Cust, St Andrews and Chatton are 3 year means.

CRBA144

YEAR 1

In its first year of CPT 2 trials feed cultivar CRBA144 has produced high yields in the southern North Island, and mostly above average to high yields in Canterbury. Moderately susceptible to net blotch but shows good resistance to other diseases, especially scald. A cultivar with average quality characteristics, moderate straw strength and intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)	Sth	Nth	Is	Canty	Sthld
TGW (g)	50	50	50		
Test weight (kg/hl)	63	64	61		
Protein (%) (N% x 6.25)	9.1	10.3	11.7		
Screenings (%)	1.7	1.3	1.7		

END USE	Feed
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BACKGROUND

Breeder	Sejet
Head Licensee	Plant & Food Research
Agent	Luisetti Seeds

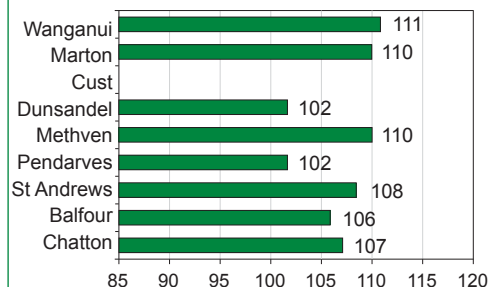
Note: St Andrews and Chatton are 3 year means.

SFR85-014

YEAR 1

A new feed cultivar with malting potential producing above average to high yields at all sites. Moderate resistance to scald but moderately susceptible to most other diseases. Above average grain weights with moderate straw strength and early to intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Early-intermediate

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	54	52	55		
Test weight (kg/hl)	62	62	60		
Protein (%) (N% x 6.25)	9.0	9.8	10.6		
Screenings (%)	0.8	1.6	1.6		

END USE

Feed/malting

BACKGROUND

Breeder	RAGT
Head Licensee	Seed Force Ltd
Agent	Not yet assigned

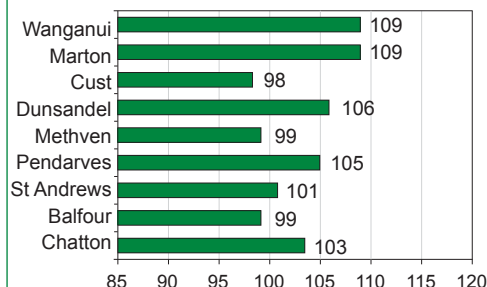
Note: St Andrews and Chatton are 3 year means.

SYN410-235

YEAR 2

A feed cultivar producing some very high yields in southern North Island, but with mixed results at other locations. Mostly susceptible to BYDV and scald, and to a lesser extent to net blotch. Moderate resistance to leaf rust. Moderate straw strength with intermediate maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	53	49	51		
Test weight (kg/hl)	62	60	59		
Protein (%) (N% x 6.25)	8.6	9.4	10.6		
Screenings (%)	3.4	4.0	4.8		

END USE

Feed

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

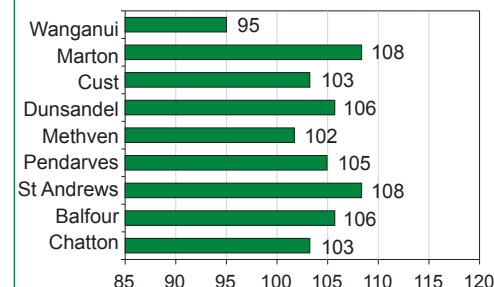
Note: Cust, St Andrews and Chatton are 3 year means.

SYN411-285

YEAR 2

In Canterbury, this is the highest yielding of the cultivars that have been in CPT2 for at least two years. Yield affected by lodging at the Wanganui site in 2014-15. Moderate resistance to leaf rust but moderately susceptible to BYDV, scald and net form of net blotch. This cultivar is of medium height with a stiff straw and late maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate-late

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	49	47	48		
Test weight (kg/hl)	62	63	61		
Protein (%) (N% x 6.25)	8.9	10.1	11.1		
Screenings (%)	5.3	2.4	3.2		

END USE

Feed

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

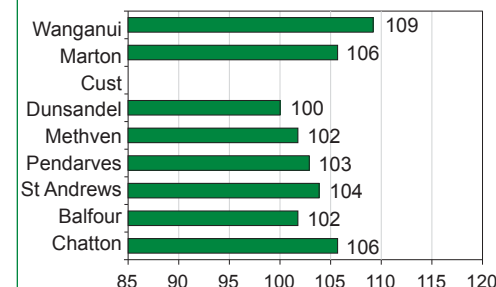
Note: Cust, St Andrews and Chatton are 3 year means.

SYN411-287

YEAR 1

A mostly above average to high yielding new feed cultivar performing well in all regions, especially in southern North Island. Monitor for disease as SYN411-287 is moderately susceptible to most diseases. This cultivar is of medium height with a stiff straw and above average grain weights.

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



DISEASE RESISTANCE

BYDV	Moderately susceptible
Scald	Moderately susceptible
Net form of net blotch	Moderately susceptible
Leaf rust	Moderately susceptible
Powdery mildew	Unknown

FIELD CHARACTERISTICS

Straw strength	Stiff
Crop height	Medium
Maturity	Intermediate

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	53	53	56		
Test weight (kg/hl)	61	62	60		
Protein (%) (N% x 6.25)	8.8	9.9	11.1		
Screenings (%)	0.4	1.7	1.2		

END USE

Feed/malting

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

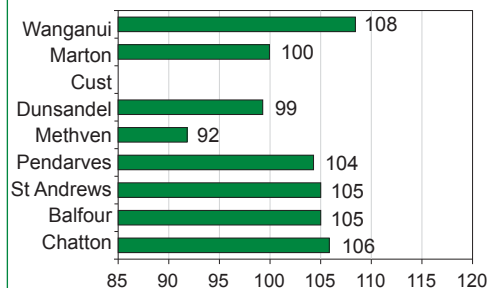
Note: St Andrews and Chatton are 3 year means.

SYN411-291

YEAR 1

SYN411-291 in its first year of CPT2 had consistently high yields in Southland but more mixed results in other regions. Moderate resistance to net blotch and leaf rust but moderately susceptible to BYDV and scald. This short cultivar has moderate straw strength and intermediate to late maturity.

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



DISEASE RESISTANCE

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

FIELD CHARACTERISTICS

Straw strength	Moderate
Crop height	Short
Maturity	Intermediate-late

GRAIN QUALITY (4 year means)

	Sth	Nth	Is	Canty	Sthld
TGW (g)	53	50	53		
Test weight (kg/hl)	60	60	60		
Protein (%) (N% x 6.25)	9.3	9.7	10.8		
Screenings (%)	0.9	2.2	1.1		

END USE

Feed/malting

BACKGROUND

Breeder	Syngenta
Head Licensee	Cropmark Seeds
Agent	Not yet assigned

Note: St Andrews and Chatton are 3 year means.

sowing date guidelines

Spring sown wheat and barley – Sowing date guidelines 2015

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

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

WHEAT	JULY	AUGUST	SEPTEMBER	OCTOBER
Raffles	■	■	■	■
Saracen	■	■	■	■
Viceroy	■	■	■	■
Discovery (KWM31)	■	■	■	■
Morph	■	■	■	■
Sage	■	■	■	■
Reliance (CRWT185)	■	■	■	■
Conquest	■	■	■	■
Sensas (KSW083)	■	■	■	■

BARLEY	JULY	AUGUST	SEPTEMBER	OCTOBER
Fairview	■	■	■	■
Putney	■	■	■	■
Booma	■	■	■	■
Calibre	■	■	■	■
Bumpa	■	■	■	■
Chronicle	■	■	■	■
Jimpy	■	■	■	■
Tavern	■	■	■	■
Garner	■	■	■	■
Quench	■	■	■	■
CRBA140	■	■	■	■
Snakebite	■	■	■	■
SYN411-285	■	■	■	■
SYN410-235	■	■	■	■
Sumit	■	■	■	■
SYN411-287	■	■	■	■
SYN411-291	■	■	■	■
CRBA144	■	■	■	■
Dash	■	■	■	■
Kelim (409-202)	■	■	■	■
Sanette (409-226)	■	■	■	■
Liberator (CRBA133)	■	■	■	■
Milford	■	■	■	■
SFR85-014	■	■	■	■
Flora	■	■	■	■

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

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

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

- the plant population you want to establish for your crop,
- the thousand grain weight 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.

- If you have scales that will weigh to 0.1g, count 200 seeds, weigh them and multiply the weight by 5 to get 1000 seed weight
- 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:

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

SOWING RATE (kg/ha)	=	target plant population (p/m ²) x TGW (g) x 100 % germination x % emergence
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Examples:

SPRING WHEAT

- wheat sample TGW = 45g
- % germination = 90%
- % emergence = 90%
- target plant population = 250pl/m²
- required sowing rate is 139 kg/ha

SPRING BARLEY

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

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

% EMERGENCE	=	actual plant population (p/m ²) x TGW (g) x 100 sowing rate (kg/ha) x % germination
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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

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. This is also important when considering residual herbicides since some products require a minimum planting depth.

WEEDS, DISEASES AND PESTS: Weeds will compete with the crop for light, moisture and nutrients. Weeds may 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 WINTER/SPRING SOWINGS

Note: for most recent trial results relating to sowing rates for autumn sown wheat, see FAR Arable Updates Cereals Nos. 129, 130, 135, 153.

Generally establishment targets are:

- June 200 plants/m²
- July 200 plants/m²
- August 200 plants/m²
- September 250 plants/m²
- October 300 plants/m²

For further reading see FAR Arable Update Cereals No's.15, 65, 66, and 81.

SEED QUALITY

High quality seed has:

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

Table: Attributes of example lines from the 2001/2002 harvest

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.
- 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.

Reminder: in spring sown cereals, aphicides do not give the same length of protection as autumn treatments due to the accelerated growth rates of the crop and thus increased rates of product breakdown.

Additionally, pressure on crops from flying aphids is also greater in spring crops, thereby increasing the importance of pest management.

SEED TREATMENT STRATEGIES

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 MBC is needed for higher levels.
- 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

Gaucho 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. Poncho is also registered for use in wheat for control of grass grub and argentine stem weevil.

paddock sowing record

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:

Alan and Brendon Moore
Brian and Mark Saunders
Craigie Mackenzie
Eric Watson
John Gardyne
John Redmond
Murray Knox
Nigel Barnett
Nigel Rathgen
Paul Mackintosh
Steve Pole
Steve Wilkins
Tim Macfarlane

TRIAL OPERATORS:

Andy Hay	Plant & Food Research
John van den Bosch	PGG Wrightson Grain
Kevin Sinclair	Plant & Food Research
Matt Hicks	Cropmark Seeds Ltd
Steve Shorter	PGG Wrightson Grain
Stewart Armstrong	Plant & Food Research

GRADING TESTS:

Jenny Sutherland	PGG Wrightson Seeds
------------------	---------------------

BIOMETRICIAN:

David Baird	VSN NZ Ltd
-------------	------------

CONTRIBUTING SCIENTISTS:

Soonie Chng	Plant & Food Research
Catherine Munro	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	FAR
Rob Craigie	FAR
Tabitha Armour	FAR

