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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
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: Craig 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.

KAI RANGA-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.
### Spring Sown Wheat Grain Quality Data 2014/2015 Season

#### Southern North Island

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

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

#### Canterbury

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

The quality data for each region is also presented as a 4 year mean on the individual cultivar description pages.
### CONQUEST YEAR 12

**Background**

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)**

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Kairanga</th>
<th>Darfield</th>
<th>Methven</th>
<th>Wakanui</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Yield (%)</td>
<td>80</td>
<td>85</td>
<td>90</td>
<td>95</td>
</tr>
</tbody>
</table>

Note: Kairanga are 3 year means.

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

### DISCOVERY (KWM31) YEAR 2

**Background**

Highest yielding bread 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)**

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Kairanga</th>
<th>Darfield</th>
<th>Methven</th>
<th>Wakanui</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Yield (%)</td>
<td>92</td>
<td>94</td>
<td>96</td>
<td>93</td>
</tr>
</tbody>
</table>

Note: Kairanga are 3 year means.
**DISEASE RESISTANCE**

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

**FIELD CHARACTERISTICS**

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

**GRAIN QUALITY (4 year means)**

- **TGW (g)**: 41
- **Test weight (kg/hl)**: 71
- **Protein (%) (N% x 5.7)**: 11.1
- **Falling number (sec)**: 314
- **Screenings (%)**: 1.8

**END USE**: Feed

**BACKGROUND**

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

Note: Kairanga are 3 year means.

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

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**RAFFLES YEAR 13**

Above average yielding feed and gristing wheat. Good performer in southern North Island. Raffles is mostly susceptible to stripe and leaf rust, and moderately susceptible to BYVD 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.

**DISEASE RESISTANCE**

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

**FIELD CHARACTERISTICS**

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

**GRAIN QUALITY (4 year means)**

- **TGW (g)**: 48
- **Test weight (kg/hl)**: 69
- **Protein (%) (N% x 5.7)**: 11.7
- **Falling number (sec)**: 392
- **Screenings (%)**: 1.2

**END USE**: Feed, gristing

**BACKGROUND**

- **Breeder**: RAGT, UK
- **Agent**: Luisetti Seeds

Note: Kairanga are 3 year means.

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**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 BYVD and stripe rust. A moderate to stiff strawed cultivar producing good proteins with a low sprouting risk.

**DISEASE RESISTANCE**

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

**FIELD CHARACTERISTICS**

- **Straw strength**: Moderate
- **Crop height**: Tall
- **Maturity**: Intermediate-late
- **Sprouting risk**: Low

**GRAIN QUALITY (4 year means)**

- **TGW (g)**: 44
- **Test weight (kg/hl)**: 73
- **Protein (%) (N% x 5.7)**: 12.8
- **Falling number (sec)**: 339
- **Screenings (%)**: 1.2

**END USE**: Bread

**BACKGROUND**

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

Note: Kairanga are 3 year means.

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**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.

**DISEASE RESISTANCE**

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

**FIELD CHARACTERISTICS**

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

**GRAIN QUALITY (4 year means)**

- **TGW (g)**: 50
- **Test weight (kg/hl)**: 74
- **Protein (%) (N% x 5.7)**: 12.3
- **Falling number (sec)**: 312
- **Screenings (%)**: 0.9

**END USE**: Bread

**BACKGROUND**

- **Breeder**: Luisetti Seeds
- **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.

Note: Kairanga are 3 year means.

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.

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.

Note: Kairanga are 3 year means.
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.

**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**

Clarenton 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.
### Spring Sown Barley Agronomic Comment 2014/2015 Season

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.

<table>
<thead>
<tr>
<th>CULTIVAR</th>
<th>Years in FAR trials</th>
<th>BYDV</th>
<th>Scal</th>
<th>Net form of net blotch</th>
<th>Leaf rust</th>
<th>Powdery Mildew</th>
<th>Straw strength</th>
<th>Crop height</th>
<th>Maturity</th>
</tr>
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<tr>
<td>Booma</td>
<td>7</td>
<td>(MR)</td>
<td>MS</td>
<td>MS</td>
<td>MR</td>
<td>Moderate</td>
<td>Med-tall</td>
<td>Early-int</td>
<td></td>
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<tr>
<td>Bumpa</td>
<td>8</td>
<td>MR</td>
<td>MS</td>
<td>MS</td>
<td>MRR</td>
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<td>Garner</td>
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<td>Tall</td>
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<td>Jimpy</td>
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<td>(MR)</td>
<td>MR</td>
<td>MR</td>
<td>MS</td>
<td>Mod-stiff</td>
<td>Medium</td>
<td>Int-late</td>
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<tr>
<td>Kelim (SYN409-202)</td>
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<td>(MS)</td>
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<td>Stiff</td>
<td>Medium</td>
<td>Early-int</td>
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<td>Short-med</td>
<td>Early-int</td>
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<td>MR</td>
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<td>(MS)</td>
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<td>Medium</td>
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**Key**

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

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

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<th>Southern NI mean</th>
<th>Ohoka/Cust</th>
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<th>St Andrews</th>
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* Cultivar not included in that particular trial.

Note: No PGR applied to Wanganui trial and considerable lodging recorded.
### Spring Sown Barley Grain Quality Data 2014/2015 Season

**Southern North Island**

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<th>Protein (%) (N% x 6.25)</th>
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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.
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<td>9.1</td>
<td>13.8</td>
<td>9.9</td>
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- 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.

**DISEASE RESISTANCE**
- BYDV: Moderate resistant
- Scald: Moderately susceptible
- 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 Shild
  - TGW (g): 46, 46, 46, 46
  - Test weight (kg/hl): 63, 64, 63
  - Protein (N x 6.25): 9.4, 10.1, 11.5
  - Screenings (%): 4.4, 3.3, 4.9

**END USE**
- Feed

**BACKGROUND**
- Breeder: Sejet
- Head Licensee: Plant & Food Research
- Agent: Luisetti Seeds

---

**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.

**DISEASE RESISTANCE**
- BYDV: Moderately resistant
- Scald: Mostly susceptible
- Leaf rust: Moderately susceptible
- 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 Shild
  - 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

---

**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.

**DISEASE RESISTANCE**
- BYDV: Moderately susceptible
- Scald: Mostly susceptible
- Leaf rust: Moderately susceptible
- Powdery mildew: Mostly resistant

**FIELD CHARACTERISTICS**
- Straw strength: Moderate-stiff
- Crop height: Medium-tall
- Maturity: Intermediate

**GRAIN QUALITY (4 year means)**
- Sth Nth Is: Canty Shild
  - 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: Limagrain Europe S.A.
- Head Licensee: Plant & Food Research
- Agent: Canterbury Seeds Ltd

---

**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.

**DISEASE RESISTANCE**
- BYDV: Moderately susceptible
- Scald: Mostly susceptible
- Leaf rust: Moderately susceptible
- Powdery mildew: Unknown

**FIELD CHARACTERISTICS**
- Straw strength: Moderate-stiff
- Crop height: Medium-tall
- Maturity: Intermediate

**END USE**
- Feed

**BACKGROUND**
- Breeder: Limagrain Europe S.A.
- Head Licensee: PGW Wrightson Grain
- Agent: PGW 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 strayed cultivar with early maturity.

**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.

**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.

**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 str awed variety with intermediate maturity.

---

**BACKGROUND**

**FAIRVIEW**

Breeder: Syngenta
Head Licensee: Cropmark Seeds
Agent: PGG Wrightson Grain

**FLORA**

Breeder: Syngenta
Head Licensee: Plant Research Ltd
Agent: Cates Grain and Seed

**GARNER**

Breeder: Ackerman
Head Licensee: Plant Research Ltd
Agent: PGG Wrightson Grain

---

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

**FAIRVIEW**

<table>
<thead>
<tr>
<th>Location</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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<td>93</td>
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<td>93</td>
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<tr>
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<td>97</td>
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<td>97</td>
</tr>
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**GARNER**

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<th>2018</th>
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<td>Chatton</td>
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**DISEASE RESISTANCE**

**BYDV**  Moderately resistant*

**Scald**   Mostly susceptible

**Net form of net blotch**  Mostly resistant

**Leaf rust**  Moderately resistant

**Powdery mildew**  Unknown

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**FIELD CHARACTERISTICS**

**FAIRVIEW**

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**GARNER**

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<td>Screenings (%)</td>
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<td>3.2</td>
<td>3.4</td>
<td>3.2</td>
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</table>

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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.

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<th>85</th>
<th>90</th>
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### RELATIVE YIELDS – 4 year adjusted mean (% of site mean yield)

- **Wanganui**: 90
- **Marton**: 94
- **Cust**: 99
- **Dunsandel**: 99
- **Methven**: 97
- **Pendaves**: 92
- **St Andrews**: 95
- **Balfour Chatton**: 95

### 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**: Stiff
- **Crop height**: Tall
- **Maturity**: Intermediate

### GRAIN QUALITY (4 year means)

- **TGW (g)**: 49
- **Test weight (kg/hl)**: 63
- **Screenings (%):** 2.8

### END USE

- **Malting**

### BACKGROUND

- **Breeder**: Syngenta
- **Head Licensee**: Cropmark Seeds
- **Agent**: Not yet assigned

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### 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.

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

- **Wanganui**: 99
- **Marton**: 102
- **Cust**: 103
- **Dunsandel**: 103
- **Methven**: 103
- **Pendaves**: 103
- **St Andrews**: 103
- **Balfour Chatton**: 103

### 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**: Medium
- **Maturity**: Intermediate

### GRAIN QUALITY (4 year means)

- **TGW (g)**: 48
- **Test weight (kg/hl)**: 62
- **Screenings (%):** 2.6

### END USE

- **Feed**

### BACKGROUND

- **Breeder**: Sejet
- **Head Licensee**: Plant & Food Research
- **Agent**: Luisetti Seeds

---

### LIBERATOR (CRBA133)
**YEAR 4**

Liberator 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.

<table>
<thead>
<tr>
<th>85</th>
<th>90</th>
<th>95</th>
<th>100</th>
<th>105</th>
<th>110</th>
<th>115</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>101</td>
<td>100</td>
<td>101</td>
<td>101</td>
<td>101</td>
<td>101</td>
<td>101</td>
</tr>
</tbody>
</table>

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

- **Wanganui**: 98
- **Marton**: 101
- **Cust**: 101
- **Dunsandel**: 101
- **Methven**: 101
- **Pendaves**: 101
- **St Andrews**: 101
- **Balfour Chatton**: 101

### 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)

- **TGW (g)**: 48
- **Test weight (kg/hl)**: 62
- **Screenings (%):** 5.5

### END USE

- **Feed**

### BACKGROUND

- **Breeder**: Breun, Germany
- **Head Licensee**: Canterbury Seed
- **Agent**: Canterbury Seed

---

### 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.

<table>
<thead>
<tr>
<th>85</th>
<th>90</th>
<th>95</th>
<th>100</th>
<th>105</th>
<th>110</th>
<th>115</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>94</td>
<td>96</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

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

- **Wanganui**: 96
- **Marton**: 94
- **Cust**: 97
- **Dunsandel**: 97
- **Methven**: 97
- **Pendaves**: 97
- **St Andrews**: 97
- **Balfour Chatton**: 97

### DISEASE RESISTANCE

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

### FIELD CHARACTERISTICS

- **Straw strength**: Stiff
- **Crop height**: Short
- **Maturity**: Intermediate

### GRAIN QUALITY (4 year means)

- **TGW (g)**: 48
- **Test weight (kg/hl)**: 62
- **Screenings (%):** 2.7

### END USE

- **Feed**

### BACKGROUND

- **Breeder**: Canterbury Seed
- **Head Licensee**: Canterbury Seed
- **Agent**: Canterbury Seed

---

Note: Cust and St Andrews 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.

**DISEASE RESISTANCE**
- BYDV: Moderately resistant
- Scald: Mostly susceptible
- Leaf rust: Moderately susceptible
- Powdery mildew: Unknown

**FIELD CHARACTERISTICS**
- Strawberry: Moderate-stiff
- Crop height: Medium
- Maturity: Intermediate-

**GRAIN QUALITY (4 year means)**
- Sth Nth Is, Canty Stld: TGW (g): 50, 48, 50
- Sth Nth Is, Canty Stld: Test weight (kg/hl): 63, 63, 62
- Sth Nth Is, Canty Stld: Protein (%): 9.4, 10.3, 11.8
- Sth Nth Is, Canty Stld: End use: Feed, Malting potential

**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.

### 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.

**DISEASE RESISTANCE**
- BYDV: Moderately susceptible
- Scald: Most susceptible
- Leaf rust: Mostly susceptible
- Powdery mildew: Mostly resistant

**FIELD CHARACTERISTICS**
- Straw strength: Stiff
- Crop height: Medium
- Maturity: Intermediate-

**GRAIN QUALITY (4 year means)**
- Sth Nth Is, Canty Stld: TGW (g): 101, 101, 105
- Sth Nth Is, Canty Stld: Test weight (kg/hl): 99, 99, 100
- Sth Nth Is, Canty Stld: Protein (%): 9.0, 9.9, 11.1
- Sth Nth Is, Canty Stld: End use: Feed, Malting potential

**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.

### 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.

**DISEASE RESISTANCE**
- BYDV: Moderately susceptible
- Scald: Most susceptible
- Leaf rust: Mostly resistant
- Powdery mildew: Unknown

**FIELD CHARACTERISTICS**
- Straw strength: Medium
- Crop height: Early-intermediate

**GRAIN QUALITY (4 year means)**
- Sth Nth Is, Canty Stld: TGW (g): 52, 51, 52
- Sth Nth Is, Canty Stld: Test weight (kg/hl): 61, 62, 60
- Sth Nth Is, Canty Stld: Protein (%): 9.0, 9.9, 11.1
- Sth Nth Is, Canty Stld: End use: Feed, Malting potential

**BACKGROUND**
- Breeder: Limagrain Europe S.A.
- Head Licensee: PGG Wrightson Grain
- Agent: PGG Wrightson Grain, Cates Grain & Seed

**Note:** Cust, Sanette 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.

**DISEASE RESISTANCE**
- BYDV: Moderately susceptible
- Scald: Mostly susceptible
- Leaf rust: Mostly susceptible
- Powdery mildew: Mostly susceptible

**FIELD CHARACTERISTICS**
- Straw strength: Medium
- Crop height: Early-intermediate

**GRAIN QUALITY (4 year means)**
- Sth Nth Is, Canty Stld: TGW (g): 54, 53, 52
- Sth Nth Is, Canty Stld: Test weight (kg/hl): 62, 63, 62
- Sth Nth Is, Canty Stld: Protein (%): 9.4, 10.7, 11.3
- Sth Nth Is, Canty Stld: End use: Feed

**BACKGROUND**
- Breeder: Limagrain Europe S.A.
- Head Licensee: Cates Grain & Seed
- Agent: PGG Wrightson Grain

**Note:** Cust, Snakebite 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 easy to intermediate maturing.

**Relative Yields**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>Wanganui</th>
<th>Marton</th>
<th>Cust</th>
<th>Dunsandel</th>
<th>Methven</th>
<th>Pendarves</th>
<th>Chatton</th>
<th>Balfour</th>
<th>St Andrews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>101</td>
<td>101</td>
<td>105</td>
<td>100</td>
<td>99</td>
<td>103</td>
<td>100</td>
<td>101</td>
<td>100</td>
</tr>
</tbody>
</table>

**Disease Resistance**

- **BYDV**: Moderately susceptible.
- **Scald**: Mostly susceptible.
- **Leaf rust**: Moderately susceptible.
- **Powdery mildew**: Mostly susceptible.

**Field Characteristics**

- **Straw strength**: Stiff.
- **Crop height**: Short-medium.

**Grain Quality (4 year means)**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>TGW (g)</th>
<th>Test weight (kg/hl)</th>
<th>Protein (% N x 6.25)</th>
<th>Screenings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>52</td>
<td>65</td>
<td>10.0</td>
<td>1.8</td>
</tr>
</tbody>
</table>

**End Use**: Feed.

**Background**

- **Breeder**: Syngenta.
- **Head Licensee**: Cropmark Seeds.
- **Agent**: Canterbury Seed.

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

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

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### 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**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>Wanganui</th>
<th>Marton</th>
<th>Cust</th>
<th>Dunsandel</th>
<th>Methven</th>
<th>Pendarves</th>
<th>Chatton</th>
<th>Balfour</th>
<th>St Andrews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>91</td>
<td>88</td>
<td>101</td>
<td>97</td>
<td>91</td>
<td>93</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
</tbody>
</table>

**Disease Resistance**

- **BYDV**: Moderately susceptible.
- **Scald**: Moderately susceptible.
- **Leaf rust**: Mostly susceptible.
- **Powdery mildew**: Moderately resistant.

**Field Characteristics**

- **Straw strength**: Stiff.
- **Crop height**: Short-medium.

**GRain Quality (4 year means)**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>TGW (g)</th>
<th>Test weight (kg/hl)</th>
<th>Protein (% N x 6.25)</th>
<th>Screenings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>106</td>
<td>65</td>
<td>10.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

**End Use**: Feed.

**Background**

- **Breeder**: Syngenta.
- **Head Licensee**: Cropmark Seeds.
- **Agent**: PGG Wrightson Grain.

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### 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**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>Wanganui</th>
<th>Marton</th>
<th>Cust</th>
<th>Dunsandel</th>
<th>Methven</th>
<th>Pendarves</th>
<th>St Andrews</th>
<th>Balfour</th>
<th>Chatton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>97</td>
<td>99</td>
<td>102</td>
<td>103</td>
<td>103</td>
<td>98</td>
<td>96</td>
<td>99</td>
<td>99</td>
</tr>
</tbody>
</table>

**Disease Resistance**

- **BYDV**: Moderately susceptible.
- **Scald**: Moderately resistant.
- **Leaf rust**: Mostly resistant.
- **Powdery mildew**: Moderately susceptible.

**Field Characteristics**

- **Straw strength**: Moderate.
- **Crop height**: Medium.

**Grain Quality (4 year means)**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>TGW (g)</th>
<th>Test weight (kg/hl)</th>
<th>Protein (% N x 6.25)</th>
<th>Screenings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>56</td>
<td>65</td>
<td>10.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

**End Use**: Feed.

**Background**

- **Breeder**: Sejet.
- **Head Licensee**: Plant & Food Research.
- **Agent**: Luisetti Seeds.

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

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### 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**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>Wanganui</th>
<th>Marton</th>
<th>Cust</th>
<th>Dunsandel</th>
<th>Methven</th>
<th>Pendarves</th>
<th>St Andrews</th>
<th>Balfour</th>
<th>Chatton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>101</td>
<td>101</td>
<td>104</td>
<td>105</td>
<td>110</td>
<td>104</td>
<td>103</td>
<td>101</td>
<td>103</td>
</tr>
</tbody>
</table>

**Disease Resistance**

- **BYDV**: Moderately resistant.
- **Scald**: Mostly resistant.
- **Leaf rust**: Moderately susceptible.
- **Powdery mildew**: Unknown.

**Field Characteristics**

- **Straw strength**: Moderate.
- **Crop height**: Medium.

**Grain Quality (4 year means)**

<table>
<thead>
<tr>
<th>Pres.</th>
<th>TGW (g)</th>
<th>Test weight (kg/hl)</th>
<th>Protein (% N x 6.25)</th>
<th>Screenings (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>64</td>
<td>10.3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

**End Use**: Feed.

**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. 

**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 years means)**
- TGW (g): 54, 52, 55
- Test weight (kg/hl): 62, 62, 62
- Protein (%): 9.0, 9.8
- Screenings (%): 0.8, 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. 

**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 years means)**
- TGW (g): 53, 53, 56
- Test weight (kg/hl): 62, 62
- Protein (%): 9.0
- Protein (%): (N x 6.25): 8.8
- Screenings (%): 5.3

**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. 

**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 years means)**
- TGW (g): 49, 47, 48
- Test weight (kg/hl): 62, 62
- Protein (%): 8.9
- Protein (%): (N x 6.25): 8.8
- Screenings (%): 5.3

**END USE**
- Feed/malting

**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.

**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

**GRAIN QUALITY (4 years means)**
- TGW (g): 53, 53, 56
- Test weight (kg/hl): 61, 62
- Protein (%): 8.8
- Protein (%): (N x 6.25): 8.8
- Screenings (%): 0.7

**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**

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 – ■■

### Spring sown wheat and barley – Sowing date guidelines 2015

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.

**SYN411-291**

<table>
<thead>
<tr>
<th>RELATIVE YIELDS – 4 year adjusted mean (% of site mean yield)</th>
</tr>
</thead>
<tbody>
<tr>
<td>cultivated area</td>
</tr>
<tr>
<td>Wanganui                                                 108</td>
</tr>
<tr>
<td>Marton                                                   100</td>
</tr>
<tr>
<td>Cust                                                     99</td>
</tr>
<tr>
<td>Dunsandel                                                92</td>
</tr>
<tr>
<td>Methven                                                  104</td>
</tr>
<tr>
<td>Pendarves                                                105</td>
</tr>
<tr>
<td>St Andrews                                               105</td>
</tr>
<tr>
<td>Balfour                                                  106</td>
</tr>
</tbody>
</table>

**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)**

<table>
<thead>
<tr>
<th>Sth</th>
<th>Nth</th>
<th>Is</th>
<th>Canty</th>
<th>Sthd</th>
</tr>
</thead>
<tbody>
<tr>
<td>TGW (g)</td>
<td>53</td>
<td>50</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Test weight (kg/ha)</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Protein (%) (N% x 6.25)</td>
<td>9.3</td>
<td>9.7</td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>Screenings (%)</td>
<td>0.9</td>
<td>2.2</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

**END USE**

Feed/malting

**BACKGROUND**

Breeder  Syngenta  
Head Licensee  Cropmark Seeds  
Agent  Not yet assigned  

Note: St Andrews and Chatton are 3 year means.

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.

i. 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
ii. 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 calculation

\[
\text{SOWING RATE} = \frac{\text{target plant population (p/m²)} \times \text{TGW (g)} \times 100}{\text{kg/ha}} \times \frac{\% \text{ germination} \times \% \text{ emergence}}{100}
\]

Examples:

SPRING WHEAT
A wheat sample TGW = 45g
B % germination = 90%
C % emergence = 90%
D target plant population = 250pl/m²
E required sowing rate is 139 kg/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 118 kg/ha

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

\[
\text{EMERGENCE} = \frac{\text{% actual plant population (p/m²)} \times \text{TGW (g)} \times 100}{\text{sowing rate (kg/ha)} \times \% \text{ germination}}
\]

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

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

ARABLE UPDATES CEREALS NOS. 129, 130, 135, 153.
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.

**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.

**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 Vitaflor are the least likely to delay emergence of damaged seed. Delayed emergence may be critical for late autumn sowings.
- Vitaflor 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 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.
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.

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.

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.

Failing number

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

Relative yields 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/ha), test weight is an indication of grain density. Test weight is reported at 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 Disease caused by Zymoseptoria tritici, (perfect stage Mycosphaerella graminicola).
Striped rust Disease caused by Puccinia striiformis f.sp. tritici.

### Glossary of Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>paddock sowing record</td>
<td>The table below is for you to record your cultivar choice and other useful information for your paddock history. An example is provided.</td>
</tr>
<tr>
<td>Paddock</td>
<td><strong>Bluegum</strong></td>
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<tr>
<td>Cultivar name</td>
<td><strong>Doyen</strong></td>
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<tr>
<td>Sowing rate (kg/ha)</td>
<td><strong>96 kg/ha</strong></td>
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<tr>
<td>Seed treatment</td>
<td><strong>Raxil</strong></td>
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<tr>
<td>Area sown (ha)</td>
<td><strong>10 ha</strong></td>
</tr>
<tr>
<td>Fertiliser (kg/ha)</td>
<td><strong>DAP 200</strong></td>
</tr>
<tr>
<td>Sowing date</td>
<td><strong>3 May</strong></td>
</tr>
</tbody>
</table>
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