

# 10. Oat Variety Trials

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When making varietal decisions with oats, need to take into account various factors, including the environmental suitability, end use (milling, feed grain, grain and graze or hay production) and likelihood that the required grade/quality will be achieved, potential disease issues (both root disease and foliar leaf diseases) and yield potential.

The 2017 SARDI sowing guide covers each of these factors in depth and can be found at <https://grdc.com.au/SA-SowingGuide2017>

The herbicide tolerance of different oat varieties as well as yield and quality information for grain varieties is available on the NVT website [www.nvtonline.com.au](http://www.nvtonline.com.au).

There were two Oats National Variety Trial (NVT) sites sown in the South East in 2016. One was located at Bordertown (Table 1) and the other at Frances (Table 2). The varieties sown were predominantly milling varieties, however Echidna (a feed grain variety) was also included.

Bannister, a dwarf milling variety was the highest yielding at both sites (5.61t/ha at Bordertown and 7.26t/ha at Frances). Williams, a tall milling variety also performed well, achieving 5.47 t/ha at Bordertown and 6.39t/ha at Frances. These two varieties are being utilised by farmers in the south-east as a flexible option to either grow for grain or hay production. To assess their performance as hay varieties, the MFMG funded an oaten hay trial at Frances (adjacent to the NVT oats trial) to look at the hay production of oat varieties (Table 3).

**Table 1:** NVT 2016 Bordertown oat variety trial, grain yield and quality.

| Variety         | Yield |             | 1000 grain weight | Test weight | Protein | Screenings |
|-----------------|-------|-------------|-------------------|-------------|---------|------------|
|                 | t/ha  | % site mean | (g/1000 seeds)    | (kg/hl)     | (%)     | (%<2.0mm)  |
| Beckom          | 5.13  | 117         | 41.02             | 80.03       | 8.7     | 0.4        |
| Cutlass         | 5     | 114         | 50.82             | 82.8        | 8.5     | 0.24       |
| Cobra           | 4.8   | 110         | 44.05             | 81.93       | 9.2     | 0.46       |
| DS Pascal       | 4.7   | 108         | 43.47             | 80.85       | 9.5     | 0.17       |
| Cosmick         | 4.58  | 105         | 42.24             | 81.01       | 8.8     | 0.48       |
| Trojan          | 4.57  | 105         | 53.26             | 83.62       | 8.7     | 0.24       |
| LRPB Arrow      | 4.56  | 104         | 45.4              | 81.91       | 9.3     | 0.44       |
| Scout           | 4.56  | 104         | 47.82             | 82.24       | 8.9     | 0.49       |
| Barham          | 4.55  | 104         | 47.03             | 79.99       | 9       | 0.36       |
| Scepter         | 4.53  | 104         | 50.8              | 81.97       | 8.8     | 0.61       |
| Harper          | 4.44  | 102         | 47.44             | 82.34       | 8.9     | 0.49       |
| Correll         | 4.37  | 100         | 50.87             | 79.87       | 9.2     | 0.32       |
| Justica CL Plus | 4.36  | 100         | 44.35             | 81.65       | 9.4     | 0.38       |
| Tungsten        | 4.34  | 99          | 52.92             | 69.62       | 9.1     | 0.37       |
| Yitpi           | 4.33  | 99          | 50.71             | 81.97       | 8.6     | 0.48       |

**Table 2:** NVT 2016 Frances oat variety trial, grain yield and quality.

| Variety       | Yield |     | 1000 grain weight | Test weight | Protein | Screenings |
|---------------|-------|-----|-------------------|-------------|---------|------------|
|               | t/ha  | %   | (g/1000 seeds)    | (kg/hl)     | (%)     | (%<2.0mm)  |
| Cobra         | 5.86  | 111 | 39.8              | 83.1        | 10.4    | 0.44       |
| Trojan        | 5.86  | 111 | 44.44             | 84.83       | 9.5     | 0.48       |
| LRPB Arrow    | 5.74  | 109 | 41.83             | 83.48       | 9.9     | 0.84       |
| DS Pascal     | 5.68  | 108 | 38.87             | 83.76       | 10.2    | 0.39       |
| Beckom        | 5.67  | 107 | 35.6              | 84.2        | 9       | 0.79       |
| Chief CL Plus | 5.54  | 105 | 50.85             | 83.6        | 10      | 0.21       |
| Scout         | 5.53  | 105 | 43.16             | 85.17       | 9.8     | 0.5        |
| Cutlass       | 5.48  | 104 | 41.82             | 83.62       | 9.2     | 0.33       |
| Harper        | 5.36  | 102 | 40.44             | 84.24       | 9.3     | 1.28       |
| Impala        | 5.28  | 100 | 37.85             | 84.2        | 10.1    | 0.61       |
| Phantom       | 5.28  | 100 | 41.98             | 81.79       | 9.5     | 0.88       |
| Yitpi         | 5.25  | 100 | 39.34             | 82.74       | 10.1    | 0.61       |
| Corack        | 5.24  | 99  | 47.77             | 83.24       | 10      | 0.18       |
| Mace          | 5.24  | 99  | 43.68             | 82.2        | 9.8     | 1          |

To complement these trials and provide growers with additional information – particularly around hay production, the MFMG implemented an oaten hay trial at Frances; selected varieties that were chosen by growers and agronomists were planted and assessed for both hay yield and grain yield. The site mean and results in the MFMG oats trial (Table 3) were similar to those received at the NVT site at Frances. The hay yields at Frances (Table 4) highlighted the ability of Bannister and Williams to

not only be high yielding grain varieties, but also their ability to provide a high level of bulk when cut for hay. Wintaroo – a true oaten hay variety produced the greatest amount of bulk, however the grade achieved (C3 under the AFIA grading system) was quite low due to the low crude protein levels. Echidna achieved the highest grade of hay (B2 under the AFIA grading system) with good digestibility.

**Table 3:** MFMG 2016 Frances lamoat variety trial, grain yield and quality results.

| Variety    | Yield |     | 1000 grain weight | Test weight | Protein | Screenings |
|------------|-------|-----|-------------------|-------------|---------|------------|
|            | t/ha  | %   | (g/1000 seeds)    | (kg/hl)     | (%)     | (%<2.0mm)  |
| Trojan     | 7.9   | 112 | 47.7              | 85.25       | 11.5    | 0.53       |
| Cobra      | 7.87  | 111 | 40.02             | 82.8        | 12.4    | 0.8        |
| Scout      | 7.56  | 107 | 43.43             | 85.27       | 11.5    | 0.79       |
| LRPB Arrow | 7.46  | 105 | 42.24             | 82.82       | 12.1    | 0.58       |
| Beckom     | 7.43  | 105 | 35.22             | 84.24       | 11.5    | 1.28       |
| Corack     | 7.42  | 105 | 49.08             | 83.26       | 11.9    | 0.68       |
| Mace       | 7.35  | 104 | 42.83             | 82.98       | 11.9    | 0.85       |
| Emu Rock   | 7.31  | 103 | 46.06             | 83.06       | 12      | 1.55       |
| Scepter    | 7.29  | 103 | 48.24             | 84          | 11.6    | 0.99       |
| DS Darwin  | 7.24  | 102 | 45.54             | 84.79       | 12.6    | 0.77       |
| DS Pascal  | 7.18  | 101 | 40.15             | 84.81       | 12.1    | 0.61       |

**Table 4:** MFMG 2016 Frances oat variety trial, hay yield and feed test results.

| Variety     | Yield |     | 1000 grain weight | Test weight | Protein | Screenings |
|-------------|-------|-----|-------------------|-------------|---------|------------|
|             | t/ha  | %   | (g/1000 seeds)    | (kg/hl)     | (%)     | (%<2.0mm)  |
| Manning     | 6.68  | 120 | 45.78             | 77.78       | 7.4     | 0.11       |
| SQP Revenue | 6.66  | 119 | 48.24             | 77.66       | 6.9     | 0.16       |
| Beaufort    | 6.58  | 118 | 45.5              | 75.45       | 8.2     | 0.59       |
| RGT Accroc  | 6.58  | 118 | 49.1              | 76.95       | 6.9     | 0.25       |
| SF Adagio   | 6.44  | 115 | 44.51             | 77.23       | 8.6     | 0.27       |
| SF Ovalo    | 6.31  | 113 | 45.09             | 78.68       | 7.6     | 0.31       |
| Trojan      | 5.87  | 105 | 52.26             | 79.93       | 9.1     | 0.12       |
| SF Scenario | 5.8   | 104 | 47.83             | 80.09       | 7.6     | 0.16       |
| Kiora       | 5.69  | 102 | 42.35             | 79.5        | 8.8     | 0.46       |
| Preston     | 5.68  | 102 | 48.13             | 77.88       | 9.2     | 0.28       |
| Coolah      | 5.67  | 102 | 48.11             | 79.95       | 8.7     | 0.31       |
| Beckom      | 5.56  | 100 | 41.06             | 78.54       | 8.5     | 0.49       |
| Brennan     | 5.55  | 99  | 46.3              | 79.79       | 8.4     | 0.36       |
| Cutlass     | 5.49  | 98  | 52.16             | 80.83       | 8.5     | 0.1        |
| Forrest     | 5.43  | 97  | 45.89             | 80.81       | 8.5     | 0.46       |
| Bolac       | 5.42  | 97  | 38.35             | 79.85       | 8.8     | 0.37       |

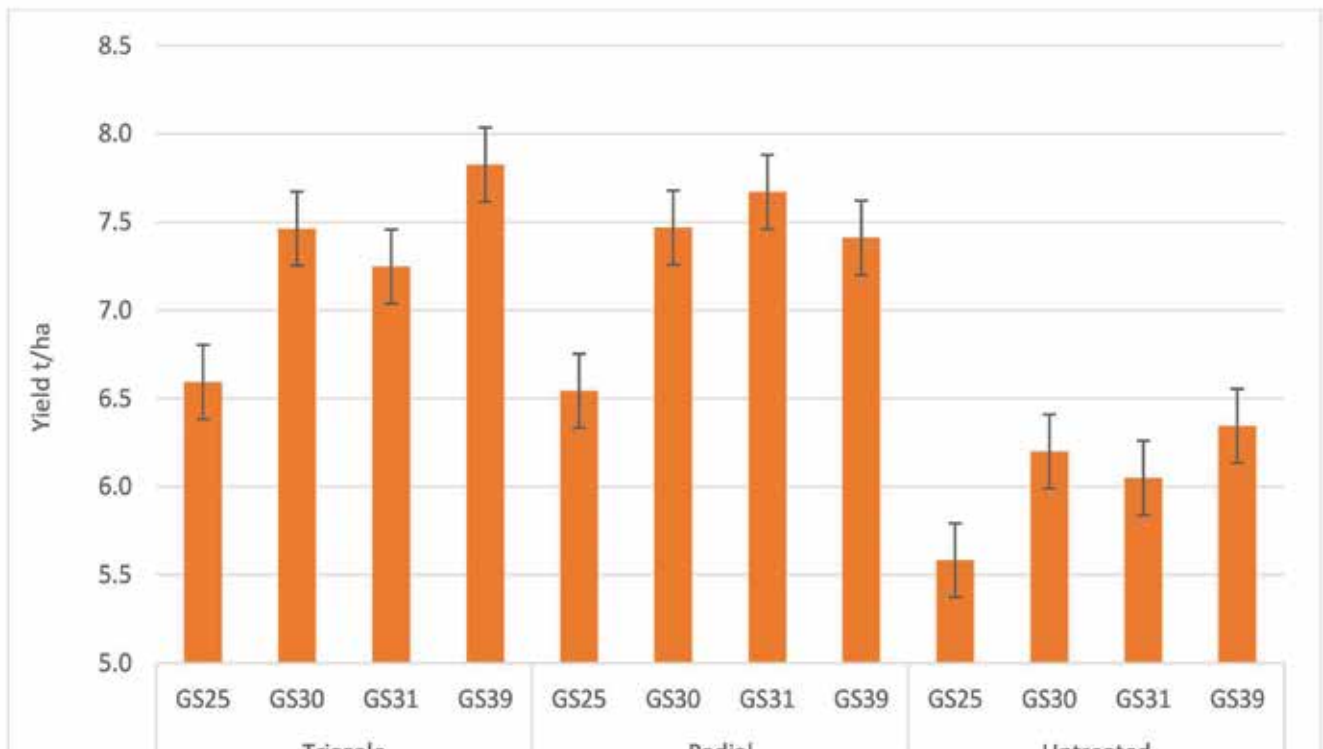
The oaten grain and hay varieties were also planted at Sherwood (Table 5-6) and Keith (Table 6-7) to compare a variety's ability to produce both quality hay and good grain yields under different environments.

This trial work has been implemented at the request of growers who are identifying the benefits of oats in a mixed cropping system. Oats can be taken through for grain (and a milling plant in close proximity at Bordertown) or if the season shuts down, can be cut for hay. It also can be used as a tool to reduce weed burdens in a continuous cropping system.

**Table 5:** MFMG 2016 Sherwood oat variety trial, grain yield and quality results.

| Variety      | Yield |             | % cracked grain in sample | 1000 grain weight (g/1000 seeds) | Test weight (kg/hl) | Protein (%) | Screening (%<2.0mm) |
|--------------|-------|-------------|---------------------------|----------------------------------|---------------------|-------------|---------------------|
|              | t/ha  | % site mean |                           |                                  |                     |             |                     |
| Caparoi      | 3.44  | 50          | -                         | 70                               | 65                  | 16          | 4.6                 |
| DBA Lillaroi | 6.44  | 93          | 25                        | 56                               | 62.6                | 12.1        | 5.4                 |
| DBA-Aurora   | 6.9   | 100         | 40                        | 64                               | 71.8                | 11.8        | 6.4                 |
| EGA Bellaroi | 7.42  | 108         | -                         | 58                               | 74.4                | 12.6        | 3.7                 |
| Hypermo      | 7.09  | 103         | -                         | 56                               | 66.4                | 11.8        | 0                   |
| Saintly      | 6.84  | 99          | -                         | 47                               | 69.6                | 11.5        | 4.8                 |
| Tjilkuri     | 6.11  | 89          | 45                        | 55                               | 69                  | 12.8        | 5                   |
| WID802       | 7.32  | 106         | 20                        | 60                               | 72.8                | 12.5        | 5.2                 |
| Yawa         | 7.83  | 113         | 50                        | 42                               | 72.8                | 11.7        | 6.0                 |

**Table 6:** MFMG 2016 Sherwood oat variety trial, hay yield and feed test results.



The trial at Keith showed a significant difference between grain yields with Wintaroo significantly lower than all other varieties. Wintaroo and Saia oat varieties were also significantly lower yielding (grain) at the Sherwood site.

There was however no significant difference between hay yields at the Keith site. Sherwood however had significant differences in hay yield with Bannister and Williams again providing high hay yields.

**Table 7:** MFMG 2016 Keith oat variety trial, grain yield and quality results.



**Table 8:** MFMG 2016 Keith oat variety trial, hay yield and feed test results.

| Variety   | Hay Yield<br>DM<br>t/ha | Dry Matter<br>(%) | Moisture<br>(%) | Crude Protein<br>(% of DM) | Acid Detergent Fibre<br>(% of DM) | Neutral Detergent Fibre<br>(% of DM) | Digestibility (DMD)<br>(% of DM) | Digestibility (DOMD)<br>(% of DM) | Est. Metabolisable Energy<br>(MJ/kg DM) | Water Soluble Carbohydrates<br>(% of DM) | Fat<br>(% of DM) | Ash<br>(% of DM) | AFIA Grade for cereal hay + silage |
|-----------|-------------------------|-------------------|-----------------|----------------------------|-----------------------------------|--------------------------------------|----------------------------------|-----------------------------------|-----------------------------------------|------------------------------------------|------------------|------------------|------------------------------------|
| Bannister | 8.9                     | 93                | 7               | 6.5                        | 34.5                              | 60.3                                 | 54.3                             | 52.8                              | 7.7                                     | 12                                       | 2.5              | 10.2             | C3                                 |
| Dunnart   | 7.1                     | 92.7              | 7.3             | 7.3                        | 34                                | 59.8                                 | 51.8                             | 50.7                              | 7.3                                     | 12.1                                     | 2.6              | 9.6              | D3                                 |
| Echidna   | 10.9                    | 93.3              | 6.7             | 7.5                        | 32.5                              | 58.8                                 | 54.2                             | 52.7                              | 7.7                                     | 10.9                                     | 2.6              | 8.6              | C3                                 |
| Mitika    | 7.5                     | 90.2              | 9.8             | 8.9                        | 32.1                              | 58.7                                 | 55.1                             | 53.5                              | 7.9                                     | 10.7                                     | 2.6              | 8.7              | C2                                 |
| Wintaroo  | 12                      | 91.4              | 8.6             | 6                          | 36.2                              | 61.6                                 | 48.5                             | 47.9                              | 6.7                                     | 10.2                                     | 2.6              | 9.1              | D3                                 |

|              |       |
|--------------|-------|
| mean         | 9.3   |
| Pvalue(0.05) | 0.143 |
| L.s.d.       | 4.52  |
| cv%          | 7     |

Below are some notes on recently released milling varieties relevant to the South East region.

Information sourced from the 2017 SARDI Sowing Guide and provided by Pamela Zwer, Sue Hoppo, Peter McCormack, Peter Wheeler, KerryLee McMurray and Michelle Williams, SARDI

**Williams** is a tall milling variety commercialised by Heritage and released in Western Australia in 2013. Williams, formerly known as the breeding line WA2332, is a high yielding early to midseason variety with similar maturity compared to Yallara. It is three to seven days later maturing than Mitika. Williams is 15 cm taller than Mitika, 5 cm taller than Bannister, and 15 cm shorter than Yallara. Although classified as MS for septoria, Williams has the highest level of septoria resistance compared to all other current oat varieties. It is resistant to leaf rust and depending on the stem rust pathotype present can range from moderately resistant to susceptible. Williams is resistant to bacterial blight and moderately resistant to moderately susceptible for BYDV. It is susceptible and intolerant to CCN. Williams has similar grain yield to Bannister with slightly inferior grain quality. Screenings are similar to Wombat and can be high, especially in the low rainfall regions. Williams has high B-glucan levels. Williams averages slightly lower hay yield compared to other hay varieties. Hay quality is similar to Wintaroo with slightly lower water soluble carbohydrates and slightly higher crude protein.

**Bannister** is a dwarf milling variety with high grain yield released for Western Australia in 2012. Bannister is suited to eastern Australia as well as Western Australia. It is adapted to low, medium, and high rainfall zones of Southern Australia. It is 13 cm taller than Mitika and heads about 3 to 4 days later than Mitika. Seednet is the commercial partner. Bannister is resistant to leaf rust and moderately resistant to bacterial blight. It is susceptible and intolerant to CCN. Bannister has slightly lower hectolitre weight and slightly higher screenings compared to Mitika. It is similar to Mitika for groat percent.

**Wombat** is a dwarf milling variety commercialised by Seednet. It is similar in height to Possum and slightly taller than Mitika. It is a midseason variety flowering about six days later than Mitika. Wombat is the first dwarf milling variety with CCN resistance and tolerance. It is also moderately tolerant and moderately resistant to stem nematode. It has improved BYDV resistance compared to other dwarf varieties and improved bacterial blight resistance compared to other dwarf varieties except Mitika. Wombat has high hectolitre weight and low screenings compared to the feed variety Potoroo, which was the first dwarf variety with CCN resistance and tolerance. It also has high groat percent, slightly higher than Mitika. Wombat can have slightly higher screenings than Mitika, Yallara and Possum depending on seasonal conditions. Wombat will develop leaf reddening symptoms similar to Mitika and Possum post flowering. This does not affect grain yield or quality.

**Mitika** is an early maturing dwarf milling oat developed by SARDI and now commercialised by Heritage Seeds. It is resistant to leaf rust and moderately resistant to stem rust and bacterial blight. However, Mitika is susceptible to CCN, BYDV, septoria and red leather leaf and intolerant to CCN and stem nematode. Mitika is a milling quality oat with high hectolitre and grain weight, low screenings percent and moderately high groat percent. It is also a high feed value oat with low hull lignin and high grain digestibility. Mitika averages higher levels of betaglucan than Possum, Yallara and Euro. It is recommended for all rainfall zones where CCN or stem nematode is not a problem. Further information on other milling varieties and oaten hay varieties is available from the SARDI sowing guide <https://grdc.com.au/SA-SowingGuide2017>

