



# Wisconsin oats and barley performance tests—2013

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The Wisconsin oats and barley performance trials are conducted each year with the producer's needs in mind. Trials include released varieties, experimental lines from Wisconsin and neighboring states, and lines from private seed companies. The primary objective of these trials is to obtain data on how varieties perform in different locations and years. Growers use these data to help choose the best varieties to plant, and breeders use performance data to determine whether or not to release a new variety.

New varieties developed and released in Wisconsin are entered in the Wisconsin Certification Program. These varieties have demonstrated superior production qualities. In addition, highly rated varieties from other states may be recommended and/or certified in the state. As new varieties are released to the public, older varieties with inferior qualities are removed from the recommended list and eventually dropped from the certified list as seed production declines.

Occasionally, varieties are certified without being recommended to Wisconsin growers. Varieties in this category may include commercial varieties developed by private seed companies or varieties where there is a substantial market for Wisconsin-produced seed. Thus, in Wisconsin, recommendation and certification do not mean the same thing. Recommended varieties are those with superior in-state production performance records, while certification provides the assurance of seed purity and seed quality.

## Variety selection

Factors to consider when selecting oat and barley varieties include grain yield, maturity, straw strength (or resistance to lodging), and disease resistance. Disease ratings are performed by the University of Wisconsin–Madison Department of Agronomy. Barley growers should consider whether a variety is acceptable for malting. Several varieties are also evaluated for forage yield (tables 4 and 7).

## How the entries were tested

Varieties included in the trial are selected based upon current demand, availability, and adaptation to Wisconsin's climate. Most of these entries are commercially available. Several commercial and public cultivars were included for comparison.

Tests were conducted at seven locations using conventional tillage practices. All plots were planted at a seeding rate of 2.5–3.0 bushels per acre. Agronomic practices at all locations are listed in table 1. Tests were conducted using four replications.

**Table 1. Location and agronomics of small grain variety trials in Wisconsin**

| Location     | Cooperators             | Soil type  | Row spacing (inches) | Average nitrogen applied (lb/a) | Planting date | Harvest date |
|--------------|-------------------------|------------|----------------------|---------------------------------|---------------|--------------|
| Arlington    | J. Albertson, N. Brickl | silt loam  | 6.0                  | 30*                             | March 29      | July 30      |
| Chilton      | Kolbe Seeds, M. Glewen  | red clay   | 12.0                 | 132                             | April 24      | August 15    |
| Lancaster    | T. Wood                 | silt loam  | 7.5                  | 8                               | April 11      | July 12      |
| Madison      | J. Mochon, T. Wright    | silt loam  | 6.0                  | 30*                             | April 5       | July 16      |
| Marshfield   | M. Bertram, N. Esser    | silt loam  | 6.0                  | 40                              | April 11      | July 19      |
| Spooner      | P. Holman               | sandy loam | 7.3                  | 40                              | April 6       | July 26      |
| Sturgeon Bay | M. Stasiak              | silt loam  | 12.0                 | 69                              | April 24      | July 24      |

\* Nitrogen credited from previous alfalfa or soybean.

## Growing conditions

**2012 season.** In Wisconsin, oats planted acres totaled 220,000 in 2012, up nearly 5% from 2011. There were 130,000 acres harvested—an increase of 15,000 acres from the previous year. The 2012 oats yield was 60.0 bushels per acre, down 2 bushels from the previous year. The increase in acres harvested resulted in a 9% increase in total production compared to last year. At 7.8 million bushels produced, Wisconsin was the second largest oat-producing state in 2012, after Minnesota.

Wisconsin produced 660,000 bushels of barley in 2012, down 6% from 2011 and down 54% from 2010. Area planted to barley, at 33,000 acres, was the same as last year, as was area harvested, at 15,000 acres. Yield was down 3 bushels from the previous year to 44 bushels per acre.

**2011 season.** In Wisconsin, oats planted acres totaled 210,000 in 2011, down 32% from 2010. There were 115,000 acres harvested, 55,000 acres less than previous year. The 2011 oats yield was 62.0 bushels per acre, up 4 bushels from the previous year. Despite the higher yield, the fewer harvested acres resulted in a 28% decrease in production from 2010, to a total of 7.13 million bushels. Wisconsin was the top oats producing state in 2011, above Minnesota, which was the top producer last year.

Wisconsin produced 705,000 bushels of barley in 2011, down 51% from 2010. Area planted to barley, at 33,000 acres, was down 27% from last year, while area harvested, at 15,000 acres, was down 50%. Yield was down 1 bushel from the previous year to 47 bushels per acre.

Source: USDA National Agricultural Statistics Service, [www.nass.usda.gov](http://www.nass.usda.gov).

## How performance was measured

**Yield:** After threshing, grain was weighed and yield was determined using a conversion formula. Yields are reported in bushels per acre at 8% moisture content. There are 32 and 48 pounds per bushel for oat and barley, respectively.

**Lodging:** Lodging is measured in percent. Values are rounded to whole numbers (1=none, 100=severe).

**Test weight:** Test weights were measured using a Toledo Model 3111 test weighting scale.

## Licensed varieties

The Wisconsin Agricultural Experiment Station and/or the UW–Madison Department of Agronomy has granted sole authority to the Wisconsin Crop Improvement Association to issue formal licenses for the production of certified seed of Kewaunee barley; Spooner rye; and Badger, Dane, ForagePlus, Gem, and Vista oats. The Wisconsin Alumni Research Foundation has granted sole authority to the Wisconsin Crop Improvement Association to issue formal licenses for the production of certified seed of Drumlin, Esker, Kame, and Moraine oats. These grants of sole authority are intended to reinforce Plant Variety Protection (PVP) regulations and to generate research and development funds for the Wisconsin small-grain breeding program. These varieties are PVP-protected and a license is required for seed production. Each bag of seed will have a special red and white PVP/Licensed Variety tag attached or preprinted on the bag.

## Testing agencies

The small grain variety tests were conducted by the Department of Agronomy, College of Agricultural and Life Sciences, University of Wisconsin–Madison in cooperation and with support from the Wisconsin Crop Improvement Association.

## Additional information

Check the following publications for additional information on small grain production and seed availability. All are updated annually.

- *Wisconsin Winter Wheat Performance Tests* (A3868), available at [learningstore.uwex.edu](http://learningstore.uwex.edu)
- *Pest Management in Wisconsin Field Crops* (A3646), available at [learningstore.uwex.edu](http://learningstore.uwex.edu)
- *The Wisconsin Certified Seed Directory*, available at [www.wcia.wisc.edu](http://www.wcia.wisc.edu)

For information on seed availability of public varieties, contact:

Wisconsin Crop Improvement Association  
554 Moore Hall  
1575 Linden Drive  
Madison, WI 53706  
(608) 262-1341  
[www.wcia.wisc.edu](http://www.wcia.wisc.edu)

**Table 2. Oat variety descriptions**

| Variety                      | Origin    | Year released | Kernel color | Maturity <sup>a</sup><br>(head date) | Ht <sup>b</sup><br>(in.) | Lodg-<br>ing % | Test<br>wt <sup>c</sup><br>(lb/bu) | Kernel<br>protein | Disease resistance <sup>d</sup> |              |               |      |                   | Licensed/<br>PVP <sup>f</sup> | Wis.<br>cert. |
|------------------------------|-----------|---------------|--------------|--------------------------------------|--------------------------|----------------|------------------------------------|-------------------|---------------------------------|--------------|---------------|------|-------------------|-------------------------------|---------------|
|                              |           |               |              |                                      |                          |                |                                    |                   | Crown<br>rust                   | Stem<br>rust | Sep-<br>toria | Smut | BYDV <sup>e</sup> |                               |               |
| <b>RECOMMENDED VARIETIES</b> |           |               |              |                                      |                          |                |                                    |                   |                                 |              |               |      |                   |                               |               |
| <b>Badger</b>                | Wisconsin | 2010          | yellow       | 6–16                                 | 31                       | med            | 36.6                               | med               | R                               | -            | -             | R    | R                 | yes                           | yes           |
| <b>Drumlin</b>               | Wisconsin | 2003          | yellow       | 6–23                                 | 35                       | weak           | 34.3                               | med               | R                               | IR           | -             | R    | R                 | yes                           | yes           |
| <b>Esker</b>                 | Wisconsin | 2004          | yellow       | 6–20                                 | 34                       | med            | 35.7                               | med               | IR                              | IR           | -             | R    | R                 | yes                           | yes           |
| <b>Excel</b>                 | Indiana   | 2006          | white        | 6–20                                 | 34                       | med            | 34.9                               | med               | R                               | S            | -             | R    | R                 | yes                           | QA*           |
| <b>Rockford</b>              | N. Dakota | 2008          | white        | 6–25                                 | 39                       | med            | 38.0                               | med               | R                               | R            | -             | MR   | R                 | yes                           | no            |
| <b>Shelby427</b>             | S. Dakota | 2009          | white        | 6–19                                 | 36                       | med            | 39.0                               | med/<br>high      | R                               | MR           | -             | MR   | R                 | yes                           | yes           |
| <b>Vista</b>                 | Wisconsin | 1999          | yellow       | 6–23                                 | 38                       | weak           | 34.7                               | low               | R                               | R            | -             | R    | R                 | yes                           | yes           |
| <b>OTHER VARIETIES</b>       |           |               |              |                                      |                          |                |                                    |                   |                                 |              |               |      |                   |                               |               |
| <b>Dane</b>                  | Wisconsin | 1990          | yellow       | 6–16                                 | 33                       | med            | 35.4                               | med               | IR                              | IR           | S             | R    | R                 | yes                           | yes           |
| <b>Kame</b>                  | Wisconsin | 2005          | yellow       | 6–18                                 | 33                       | weak           | 32.9                               | med               | IR                              | IR           | -             | R    | IR                | yes                           | yes           |
| <b>Ogle</b>                  | Illinois  | 1981          | yellow       | 6–20                                 | 34                       | med            | 34.8                               | low               | IR                              | S            | S             | S    | R                 | no                            | yes           |

<sup>a</sup> Maturity (month-day) as indicated by heading date in 18 Wisconsin tests conducted 2010–2012.

Varieties with generalized ratings indicate the following:  
early = before June 18, mid = June 19–21, late = after June 21.

<sup>b</sup> Height (inches) at maturity in 20 Wisconsin tests conducted 2010–2012.

Varieties with generalized ratings indicate the following:  
short = < 33 inches, med = 33–38 inches, tall = > 38 inches.

<sup>c</sup> Test weight (pounds/bushel) in 20 Wisconsin tests conducted 2010–2012.

Varieties with generalized ratings indicate the following:  
low = < 33 lb/bu, med = 33–35 lb/bu, high = > 35 lb/bu.

<sup>d</sup> Disease resistance: R = excellent resistance, IR = intermediate or very good, MR=moderate or good, S = susceptible or poor resistance.

<sup>e</sup> BYDV=Barley yellow dwarf virus or red leaf disease.

<sup>f</sup> PVP=Plant Variety Protection or licensed for seed production.

A “yes” indicates that these varieties can’t be grown and sold as seed without certification.

\*Q A= Quality Assurance

(-) = Information not available.

**Table 3. Oat variety grain yield comparisons in Wisconsin**

| Variety                        | Mean | —Southern— |           |         | —Northern— |            |         |              |
|--------------------------------|------|------------|-----------|---------|------------|------------|---------|--------------|
|                                |      | Arlington  | Lancaster | Madison | Chilton    | Marshfield | Spooner | Sturgeon Bay |
| <b>2012 yields (bu/a)</b>      |      |            |           |         |            |            |         |              |
| <b>EARLY SEASON</b>            |      |            |           |         |            |            |         |              |
| Badger                         | 82   | 120*       | 107*      | 74*     | -----      | 91*        | 46      | 53           |
| Dane                           | 76   | 112*       | 85        | 80*     | -----      | 79         | 51      | 50           |
| Kame                           | 82   | 105        | 105       | 71      | -----      | 91*        | 74*     | 48           |
| <b>MIDSEASON</b>               |      |            |           |         |            |            |         |              |
| Esker                          | 89*  | 120*       | 114*      | 76*     | -----      | 102*       | 66      | 54           |
| Excel                          | 92*  | 117*       | 123*      | 83*     | -----      | 98*        | 86*     | 48           |
| Ogle                           | 89*  | 112*       | 116*      | 72*     | -----      | 98*        | 81*     | 54           |
| Shelby427                      | 88*  | 116*       | 110*      | 73*     | -----      | 87         | 88*     | 56           |
| <b>LATE SEASON</b>             |      |            |           |         |            |            |         |              |
| Drumlin                        | 85   | 96         | 104       | 72*     | -----      | 90*        | 84*     | 64*          |
| Rockford                       | 79   | 88         | 102       | 60      | -----      | 79         | 71*     | 74*          |
| Vista                          | 73   | 73         | 113*      | 48      | -----      | 76         | 69      | 58           |
| Mean                           | 84   | 106        | 108       | 71      | -----      | 89         | 72      | 56           |
| LSD (0.05) <sup>a</sup>        | 5    | 11         | 16        | 11      | -----      | 13         | 18      | 13           |
| <b>2010–2012 yields (bu/a)</b> |      |            |           |         |            |            |         |              |
| <b>EARLY SEASON</b>            |      |            |           |         |            |            |         |              |
| Badger                         | 84   | 124*       | 101*      | 98*     | 76         | 54         | 58      | 79           |
| Dane                           | 72   | 101        | 85        | 80      | 67         | 50         | 39      | 81           |
| Kame                           | 76   | 99         | 91        | 79      | 68         | 57         | 55      | 82           |
| <b>MIDSEASON</b>               |      |            |           |         |            |            |         |              |
| Esker                          | 84   | 107        | 107*      | 89      | 70         | 60         | 60      | 89*          |
| Excel                          | 87   | 110        | 99*       | 84      | 86         | 70         | 67*     | 90*          |
| Ogle                           | 83   | 99         | 98        | 77      | 72         | 60         | 73*     | 99*          |
| Shelby427                      | 90*  | 123*       | 102*      | 101*    | 78         | 63*        | 76*     | 86           |
| <b>LATE SEASON</b>             |      |            |           |         |            |            |         |              |
| Drumlin                        | 86   | 97         | 95        | 86      | 75         | 74*        | 79*     | 90*          |
| Rockford                       | 92*  | 111        | 109*      | 98*     | 105        | 67*        | 76*     | 84           |
| Vista                          | 82   | 92         | 103*      | 81      | 72         | 64*        | 74*     | 86           |
| Mean                           | 84   | 106        | 99        | 87      | 77         | 62         | 66      | 87           |
| LSD (0.05) <sup>a</sup>        | 4    | 7          | 10        | 7       | 12         | 11         | 13      | 11           |

\* Varieties not significantly different from the highest yielding variety in the trial.

<sup>a</sup> The LSD (least significant difference) figures listed under the yield columns are a statistical measure of variation within the trial. If the difference in yield of two varieties is equal to or greater than LSD, the yields are significantly different. If the difference is less than the LSD, the yield difference may have been due to environmental factors.

**Table 4. Forage dry matter yield of spring oat varieties harvested at late boot/early heading**

| Variety           | Yield (t/a) |           |       | Harvest date<br>June | Crude protein (%) | RFQ <sup>a</sup> | Yield (t/a) | Harvest date<br>June |
|-------------------|-------------|-----------|-------|----------------------|-------------------|------------------|-------------|----------------------|
|                   | Madison     | Arlington | Mean  |                      |                   |                  |             |                      |
| -----2012-----    |             |           |       | -----2010-2012-----  |                   |                  |             |                      |
| <b>ForagePlus</b> | 2.20*       | 2.00      | 2.10* | 6-15                 | 13.0*             | 124.6*           | 2.30        | 6-24                 |
| <b>Rockford</b>   | 1.80*       | 1.50      | 1.65  | 6-10                 | 13.8*             | 130.6*           | 1.74        | 6-19                 |
| <b>Vista</b>      | 2.20*       | 1.70      | 1.95* | 6-9                  | 13.9*             | 123.5*           | 1.82        | 6-17                 |
| <b>LSD (0.05)</b> | 0.40        | 0.29      | 0.24  |                      | 1.14              | 9.82             | 0.17        |                      |

<sup>a</sup>RFQ = Relative forage quality. Relative forage quality values can be used to make comparisons among varieties listed in this table, but should not be used to compare with other crops, such as alfalfa.

\* Varieties not significantly different from the highest yielding variety in the trial.

**Table 5. Barley variety descriptions**

| Variety                      | Origin    | Year re-leased | Awns        | Quality | Maturity <sup>a</sup><br>(head date) | Ht <sup>b</sup><br>(in.) | Lodging <sup>c</sup><br>(%) | Test wt <sup>d</sup><br>(lb/bu) | Disease resistance <sup>e</sup> |           |            |              |             |                           |            |  |
|------------------------------|-----------|----------------|-------------|---------|--------------------------------------|--------------------------|-----------------------------|---------------------------------|---------------------------------|-----------|------------|--------------|-------------|---------------------------|------------|--|
|                              |           |                |             |         |                                      |                          |                             |                                 | Crown rust                      | Stem rust | Loose smut | Powd. mildew | Spot blotch | Licensed/PVP <sup>f</sup> | Wis. cert. |  |
| <b>RECOMMENDED VARIETIES</b> |           |                |             |         |                                      |                          |                             |                                 |                                 |           |            |              |             |                           |            |  |
| <b>Kewaunee</b>              | Wisconsin | 1997           | Smooth      | feed    | 6-17                                 | 30                       | med                         | 42.7                            | R                               | R         | --         | IR           | R           | yes                       | yes        |  |
| <b>Pinnacle</b>              | N. Dakota | 2008           | Smooth      | malt    | 6-19                                 | 29                       | med                         | 44.5                            | --                              | --        | --         | --           | MR          | yes                       | yes        |  |
| <b>Quest</b>                 | Minnesota | 2010           | Smooth      | malt    | 6-18                                 | 31                       | med                         | 44.4                            | --                              | R         | --         | IR           | R           | yes                       | no         |  |
| <b>Rasmusson</b>             | Minnesota | 2008           | Semi-smooth | malt    | 6-17                                 | 28                       | med                         | 44.7                            | --                              | R         | --         | IR           | R           | yes                       | yes        |  |
| <b>OTHER VARIETIES</b>       |           |                |             |         |                                      |                          |                             |                                 |                                 |           |            |              |             |                           |            |  |
| <b>Stander</b>               | Minnesota | 1993           | Smooth      | feed    | 6-17                                 | 28                       | med                         | 44.3                            | --                              | R         | S          | S            | R           | yes                       | no         |  |

<sup>a</sup> Maturity (month-day) as indicated by heading date in 18 Wisconsin tests conducted 2010-2012. Varieties with generalized ratings indicate the following: early = before June 21, mid = June 21-25, late = after June 25.

<sup>b</sup> Height (inches) at maturity in 20 Wisconsin tests conducted 2010-2012. Varieties with generalized ratings were included in other tests and indicate the following: short = < 30 inches, med = 30-36 inches, tall = > 36 inches.

<sup>c</sup> Lodging: strong = < 15%, med = 15-35%, weak = > 35%.

<sup>d</sup> Test weight (pounds/bushel) in 19 Wisconsin tests conducted 2010-2012. Varieties with generalized ratings were included in other tests and indicate the following: low = < 42 lb/bu, med = 42-46 lb/bu, high = > 46 lb/bu.

<sup>e</sup> Disease resistance: R = excellent resistance, IR = intermediate or very good, MR=moderate or good, S = susceptible or poor resistance.

<sup>f</sup> PVP = Plant Variety Protection or licensed for seed production. A "yes" indicates that these varieties cannot be reproduced and sold as seed without certification.

(--) = Information not available.

**Table 6. Barley variety grain yield comparisons in Wisconsin**

| Variety                 | Mean | Southern                       |           |         | Northern |            |         |              |
|-------------------------|------|--------------------------------|-----------|---------|----------|------------|---------|--------------|
|                         |      | Arlington                      | Lancaster | Madison | Chilton  | Marshfield | Spooner | Sturgeon Bay |
| <b>2012 YIELDS</b>      |      | <b>2012 yields (bu /a)</b>     |           |         |          |            |         |              |
| Kewaunee                | 38   | 47                             | 43*       | 33*     | ----     | 55*        | 26*     | 25*          |
| Pinnacle                | 34   | 46                             | 36        | 23      | ----     | 53*        | 18      | 31*          |
| Quest                   | 44*  | 58*                            | 50*       | 34*     | ----     | 60*        | 35*     | 25*          |
| Rasmusson               | 44*  | 67*                            | 47*       | 36*     | ----     | 57*        | 30*     | 25*          |
| Stander                 | 36   | 55                             | 35        | 31*     | ----     | 51*        | 21      | 24*          |
| Mean                    | 39   | 54                             | 42        | 31      | ----     | 55         | 26      | 26           |
| LSD (0.05) <sup>a</sup> | 4    | 9                              | 10        | 10      | ----     | 11         | 10      | 8            |
| <b>HISTORIC YIELDS</b>  |      | <b>2010–2012 yields (bu/a)</b> |           |         |          |            |         |              |
| Kewaunee                | 48   | 73                             | 49        | 57*     | 39*      | 52*        | 34*     | 29           |
| Pinnacle                | 48   | 69                             | 50        | 48*     | 41*      | 57*        | 35*     | 35*          |
| Quest                   | 50*  | 78*                            | 53        | 53*     | 41*      | 56*        | 39*     | 30*          |
| Rasmusson               | 51*  | 79*                            | 61*       | 55*     | 45*      | 51*        | 36*     | 30*          |
| Stander                 | 48   | 73                             | 54*       | 55*     | 39*      | 46         | 34*     | 30*          |
| Mean                    | 49   | 74                             | 53        | 54      | 41       | 52         | 36      | 31           |
| LSD (0.05) <sup>a</sup> | 2    | 5                              | 7         | 10      | 7        | 7          | 6       | 5            |

\* Varieties not significantly different from highest yielding variety in the trial.

<sup>a</sup> The LSD (least significant difference) figures listed under the yield columns are a statistical measure of variation within the trial. If the difference in yield of two varieties is equal to or greater than the LSD, then the yields are significantly different. If the difference is less than the LSD, then the yield difference may have been due to environmental factors.

**Table 7. Forage dry matter yield of spring barley varieties harvested at late boot/early heading**

| Variety    | Yield (t/a) |           |       | Harvest date<br>June | Crude protein<br>(%) | RFQ <sup>a</sup> | Yield<br>(t/a) | Harvest date<br>June |
|------------|-------------|-----------|-------|----------------------|----------------------|------------------|----------------|----------------------|
|            | Madison     | Arlington | Mean  |                      |                      |                  |                |                      |
|            |             | 2012      |       |                      | 2010–2012            |                  |                |                      |
| Kewaunee   | 1.60*       | 1.10*     | 1.35* | 6–4                  | 14.8*                | 134.5*           | 1.44*          | 6–12                 |
| Westford   | 1.30*       | 1.20*     | 1.25* | 6–13                 | 14.0*                | 132.8*           | 1.50*          | 6–21                 |
| LSD (0.05) | 0.40        | 0.29      | 0.24  |                      | 1.14                 | 9.82             | 0.17           |                      |

<sup>a</sup> RFQ=Relative forage quality. Relative forage quality values can be used to make comparisons among varieties, but should not be used to compare with other crops, such as alfalfa.

\* Varieties not significantly different from the highest yielding variety in the trial.



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