**Oat Variety Trial 2022**

**Cooperators**:

* ISU Northern Research Farm – Kanawha (Matt Schnabel)
* ISU Ag Engineering and Agronomy Farm – Boone (Matt Schnabel)
* ISU Northeast Research Farm – Nashua (Ken Pecinovsky)
* ISU Southwest Research Farm – Greenfield (Matt Schnabel)

**Year**: 2022

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**Funding**: USDA-NIFA, Walton Family Foundation, Albert Lea Seed House, Welter Seed and Honey Co., Meridian Seeds, SDSU Seed Foundation, Zabel Seeds

**In a Nutshell:**

* 17 oat varieties were screened at four Iowa State University research farms.
* Key Findings
  + Across varieties and sites, average oat yield was 117 bu/ac.
  + Antigo was the only variety to score a test weight ≥38 lb/bu (food grade) at each location; Reins and Sumo scored test weights ≥38 lb/bu at three of four locations.

**PHOTO**

**IMG\_1635**

**Caption:** Oats at Boone on July 17, 2022.

**Background**

In 2022, 120,000 acres of oats were planted in Iowa according to the USDA-National Agricultural Statistics Service; down from 180,000 acres in 2021. The state average yield for the year was 70 bu/ac; the five-year average yield is 69 bu/ac.[1]

**Methods**

Variety trials were conducted at four locations in 2022: ISU Northern Research Farm in Kanawha; ISU Ag Engineering and Agronomy Farm in Boone; ISU Northeast Research Farm in Nashua; ISU Southwest Research Farm in Greenfield. These variety trials build on previous trials conducted at Kanawha, Charles City, Boone, Nashua and Greenfield from 2015­–2021.[2–8] Information about each of the varieties trialed in 2022 can be found in **Table 1**.

Oat management information is provided with the results from each location. No herbicides or insecticides were applied at any location. Statistical significance is determined at 90% confidence level and means separations are reported using Tukey’s least significant difference (LSD).

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TABLE 1. Origin, PVP and disease ratings for oat varieties screened in 2022. | | | | | | | | |
| **VARIETY** | **ORIGINa** | **YEAR RELEASED** | **PVPb** | **MATURITY** | **DISEASE RATINGSc** | | | |
| **CROWN RUST** | **STEM RUST** | **BYDVd** | **SMUT** |
| Antigo | WI | 2017 | PVP | Early | MR | S | MR | MR |
| CS Camden | SW | 2013 | PVP | Medium | MS | S | -- | MR |
| Deon | MN | 2014 | PVP | Late | MR | MS | MR | R |
| Esker 2020 | WI | 2020 | PVP | Medium | MR | MR | MR | R |
| Goliath | SD | 2013 | PVP | Late | MS | R | MR | MR |
| Hayden | SD | 2015 | PVP | Med-Late | MS | MS | MR | R |
| Jerry | ND | 1994 | PVP | Medium | MS | MS | MS | MS |
| MN Pearl | MN | 2018 | PVP | Late | MS | -- | MS | R |
| Morton | ND | 2001 | PVP | Late | MS | -- | MS | R |
| Natty | SD | 2015 | PVP | Medium | MR | MS | MR | R |
| Reins | IL | 2016 | PVP | Early | MR | MR | R | R |
| Rushmore | SD | 2019 | Pending | Medium | MR | -- | MR | MR |
| Saddle | SD | 2018 | Pending | Early | MR | S | MR | -- |
| Shelby 427 | SD | 2011 | PVP | Medium | MS | MS | MR | MR |
| SD Buffalo | SD | 2022 | PVP | Medium | -- | -- | -- | -- |
| Sumo | SD | 2017 | PVP | Early | MR | R | MS | R |
| Warrior | SD | 2019 | Pending | Med-Late | R | -- | MS | R |
| a Origin: IL-University of Illinois; MN-University of Minnesota; ND-North Dakota State University; SD-South Dakota State University; SW-Lantmannen Seed, Sweden; WI-University of Wisconsin. | | | | | | | | |
| b PVP = Plant Variety Protection. The PVP Act provides a certificate to the developer of a variety granting exclusive rights for reproducing and marketing the seed. | | | | | | | | |
| c Disease Ratings: S = susceptible; MS = moderately susceptible; MR = moderately resistant; R = resistant. | | | | | | | | |
| d Disease: BYDV = Barley Yellow Dwarf Virus. | | | | | | | | |

**Results and Discussion**

Data were analyzed by location, and varieties are listed in alphabetical order at each location. Reported yields are corrected for 13% moisture. A “percentage of test average” calculation is included to aid in comparing varieties at each location. Rainfall and temperature data were accessed from the nearest weather station.[9] Rainfall in 2022 was above historical averages at Kanawha and Nashua.

Ten varieties at Kanawha and three varieties at Boone and Greenfield made a test weight of 38 lb/bu – the standard minimum that many food companies require before dockage is applied. At Nashua, only Antigo made test weight ≥38 lb/bu. A test weight of 36 lb/bu is a minimum processing facilities can use for food-grade milling and several varieties at each location made this test weight.

**ISU Northern Research Farm, Kanawha**

Previous crop: Soybeans

Replications: 3

Harvested plot size: 5 ft × 46 ft

Fertilizer applied: 261 lb K/ac on Nov. 1, 2021; 37 lb N/ac as urea on Apr. 11, 2022

Planting date: Apr. 11, 2022

Row spacing: 7.5 in.

Seeding rate: 4 bu/ac

Seeding depth: 1 in.

Harvest date: July 28

**Kanawha Weather Figure**

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| --- | --- | --- | --- | --- | --- | --- |
| TABLE 2. 2022 Oat Variety Trial at Kanawha in north-central Iowa.  *Varieties with a test weight that meets food grade specification (*≥*38 lb/bu) are highlighted.* | | | | | | |
| **VARIETY** | **YIELD** | | | **TEST WEIGHT (lb/bu)** | **PLANT HT**  **at HARVEST (in.)** | **LODGING (%)** |
| **(bu/ac)** | **(% of site avg.)** | **8-yr avg. (bu/ac)** |
| Antigo | 120 | 103 | 91 | 42.1 | 33 | 7 |
| CS Camden | 109 | 93 | 97 | 35.6 | 39 | 0 |
| Deon | 124 | 106 | 99 | 38.0 | 40 | 0 |
| Esker 2020 | 114 | 98 | 111 | 35.4 | 40 | 2 |
| Goliath | 106 | 91 | 89 | 39.0 | 42 | 12 |
| Hayden | 130 | 111 | 100 | 38.8 | 39 | 0 |
| Jerry | 122 | 104 | 81 | 39.9 | 37 | 0 |
| MN Pearl | 121 | 103 | 113 | 37.1 | 39 | 0 |
| Morton | 94 | 80 | 102 | 37.2 | 46 | 0 |
| Natty | 120 | 103 | 101 | 39.2 | 39 | 0 |
| Reins | 130 | 112 | 97 | 39.0 | 33 | 0 |
| Rushmore | 126 | 108 | 132 | 38.7 | 38 | 0 |
| Saddle | 130 | 111 | 115 | 37.7 | 34 | 0 |
| SD Buffalo | 123 | 105 | -- | 37.9 | 40 | 0 |
| Shelby 427 | 108 | 93 | 91 | 39.2 | 36 | 0 |
| Sumo | 101 | 87 | 85 | 40.0 | 38 | 0 |
| Warrior | 107 | 92 | 114 | 37.2 | 38 | 0 |
| MEAN | 117 | -- | -- | 38.3 | 38 | -- |
| LSD(90%) | 30 | -- | -- | 2.4 | 7 | -- |
| a By response variable, if the difference between any two entries is greater than the least significant difference (LSD) the entries are considered statistically different with 90% confidence. | | | | | | |
|
| b 8-yr. average yields are listed for varieties trialed at least twice in the past seven years at this location. | | | | | | |

**ISU Ag Engineering and Agronomy Farm, Boone**

Previous crop: Soybeans

Replications: 3

Harvested plot size: 5 ft × 49 ft

Fertilizer applied: 30 lb N/ac; 11 lb P/ac; 40 lb K/ac; 25 lb S/ac on Apr. 11, 2022

Planting date: Apr. 19, 2022

Row spacing: 7.5 in.

Seeding rate: 4 bu/ac

Seeding depth: 1 in.

Harvest date: July 29

**Boone Weather Figure**

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| TABLE 3. 2022 Oat Variety Trial at Boone in central Iowa.  *Varieties with a test weight that meets food grade specification (*≥*38 lb/bu) are highlighted.* | | | | | | |
| **VARIETY** | **YIELD** | | | **TEST WEIGHT (lb/bu)** | **PLANT HT**  **at HARVEST (in.)** | **LODGING (%)** |
| **(bu/ac)** | **(% of site avg.)** | **5-yr avg. (bu/ac)** |
| Antigo | 100 | 107 | 85 | 40.3 | 29 | 25 |
| CS Camden | 82 | 87 | 87 | 33.8 | 29 | 13 |
| Deon | 87 | 93 | 90 | 35.7 | 33 | 15 |
| Esker 2020 | 92 | 99 | 101 | 34.5 | 32 | 15 |
| Goliath | 101 | 108 | 92 | 36.3 | 37 | 18 |
| Hayden | 83 | 88 | 86 | 37.3 | 32 | 0 |
| Jerry | 101 | 107 | 82 | 37.3 | 31 | 0 |
| MN Pearl | 88 | 94 | 95 | 37.1 | 31 | 0 |
| Morton | 87 | 93 | 95 | 35.3 | 35 | 0 |
| Natty | 97 | 103 | 88 | 35.9 | 34 | 2 |
| Reins | 110 | 117 | 98 | 38.8 | 27 | 0 |
| Rushmore | 98 | 105 | 113 | 37.8 | 31 | 0 |
| Saddle | 95 | 101 | 99 | 36.3 | 29 | 0 |
| SD Buffalo | 105 | 112 | -- | 35.5 | 33 | 0 |
| Shelby 427 | 87 | 93 | 82 | 37.4 | 34 | 0 |
| Sumo | 80 | 85 | 82 | 39.2 | 33 | 0 |
| Warrior | 98 | 105 | 103 | 35.4 | 29 | 0 |
| MEAN | 94 | -- | -- | 37.0 | 32 | -- |
| LSD(90%) | 38 | -- | -- | 3.7 | 5 | -- |
| a By response variable, if the difference between any two entries is greater than the least significant difference (LSD) the entries are considered statistically different with 90% confidence. | | | | | | |
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| b 5-yr. average yields are listed for varieties trialed at least twice in the past seven years at this location. | | | | | | |

**ISU Northeast Research Farm, Nashua**

Previous crop: Soybeans

Replications: 3

Harvested plot size: 8 ft × 85 ft

Fertilizer applied: 35 lb N/ac, 58 lb P/ac; 135 lb K/ac Nov. 15, 2021

Tillage: Field cultivator on March 29; Mulch finish cultivator on Apr. 10

Planting date: Apr. 11 followed by cultipacker

Row spacing: 7.5 in.

Seeding rate: 4 bu/ac

Seeding depth: 1 in.

Harvest date: July 25 (grain); July 26 (straw)

**Nashua Weather Figure**

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| TABLE 4. 2022 Oat Variety Trial at Nashua in northeast Iowa.  *Varieties with a test weight that meets food grade specification (*≥*38 lb/bu) are highlighted.* | | | | | | |
| **VARIETY** | **YIELD** | | | **TEST WEIGHT (lb/bu)** | **PLANT HT**  **at HARVEST (in.)** | **STRAW YIELD (ton/ac)** |
| **(bu/ac)** | **(% of site avg.)** | **8-yr avg. (bu/ac)** |
| Antigo | 129 | 96 | 112 | 39.3 | 33 | 1.53 |
| CS Camden | 116 | 87 | 111 | 32.6 | 34 | 1.60 |
| Deon | 136 | 102 | 126 | 34.7 | 38 | 2.47 |
| Esker 2020 | 152 | 113 | 136 | 34.3 | 35 | 1.97 |
| Goliath | 140 | 105 | 129 | 35.9 | 43 | 2.00 |
| Hayden | 130 | 98 | 129 | 36.1 | 37 | 2.17 |
| Jerry | 116 | 87 | 110 | 36.5 | 36 | 1.43 |
| MN Pearl | 132 | 99 | 132 | 34.0 | 37 | 1.93 |
| Morton | 119 | 89 | 115 | 33.8 | 40 | 2.27 |
| Natty | 147 | 110 | 127 | 36.5 | 38 | 2.20 |
| Reins | 141 | 106 | 121 | 37.3 | 29 | 1.30 |
| Rushmore | 151 | 113 | 138 | 37.6 | 36 | 2.17 |
| Saddle | 138 | 103 | 129 | 36.5 | 32 | 2.20 |
| SD Buffalo | 141 | 105 | -- | 36.0 | 38 | 2.60 |
| Shelby 427 | 130 | 97 | 117 | 37.1 | 37 | 1.97 |
| Sumo | 124 | 93 | 112 | 36.8 | 33 | 2.23 |
| Warrior | 131 | 98 | 125 | 36.0 | 33 | 2.53 |
| MEAN | 134 | -- | -- | 35.9 | 36 | 2.03 |
| LSD(90%) | 13 | -- | -- | 0.3 | 2 | 0.69 |
| a By response variable, if the difference between any two entries is greater than the least significant difference (LSD) the entries are considered statistically different with 90% confidence. | | | | | | |
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| b 8-yr. average yields are listed for varieties trialed at least twice in the past seven years at this location. | | | | | | |

**ISU Southwest Research Farm, Greenfield**

Previous crop: Soybeans

Replications: 3

Harvested plot size: 5 ft × 50 ft

Fertilizer applied: 30 lb N/ac as urea on March 28

Tillage: Disked on March 28

Planting date: Apr. 6 followed by cultipacker

Row spacing: 7.5 in.

Seeding rate: 4 bu/ac

Seeding depth: 1 in.

Harvest date: July 22

**Greenfield Weather Figure**

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| TABLE 5. 2022 Oat Variety Trial at Greenfield in southwest Iowa.  *Varieties with a test weight that meets food grade specification (*≥*38 lb/bu) are highlighted.* | | | | | | |
| **VARIETY** | **YIELD** | | | **TEST WEIGHT (lb/bu)** | **PLANT HT**  **at HARVEST (in.)** | **LODGING (%)** |
| **(bu/ac)** | **(% of site avg.)** | **3-yr avg. (bu/ac)** |
| Antigo | 120 | 97 | 112 | 39.8 | 38 | 12 |
| CS Camden | 116 | 93 | 106 | 33.6 | 38 | 2 |
| Deon | 118 | 95 | 115 | 36.0 | 39 | 0 |
| Esker 2020 | 114 | 92 | 124 | 33.6 | 40 | 7 |
| Goliath | 107 | 86 | 91 | 37.9 | 43 | 5 |
| Hayden | 136 | 109 | 125 | 37.6 | 41 | 0 |
| Jerry | 117 | 94 | 92 | 37.3 | 40 | 0 |
| MN Pearl | 119 | 96 | 130 | 36.5 | 38 | 2 |
| Morton | 104 | 84 | 101 | 35.5 | 45 | 0 |
| Natty | 132 | 106 | 125 | 37.8 | 37 | 3 |
| Reins | 149 | 120 | 144 | 38.5 | 34 | 0 |
| Rushmore | 129 | 103 | 134 | 37.6 | 39 | 0 |
| Saddle | 133 | 107 | 136 | 36.8 | 36 | 0 |
| SD Buffalo | 136 | 110 | -- | 36.4 | 41 | 0 |
| Shelby 427 | 134 | 108 | 128 | 37.7 | 39 | 0 |
| Sumo | 105 | 85 | 113 | 38.7 | 37 | 0 |
| Warrior | 144 | 116 | 124 | 36.8 | 40 | 0 |
| MEAN | 124 | -- | -- | 34.7 | 39 | -- |
| LSD(90%) | 31 | -- | -- | 2.1 | 6 | -- |
| a By response variable, if the difference between any two entries is greater than the least significant difference (LSD) the entries are considered statistically different with 90% confidence. | | | | | | |
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| b 3-yr. average yields are listed for varieties trialed at least twice in the past seven years at this location. | | | | | | |

**Funding Acknowledgement**

This work is supported by the Agriculture and Food Research Initiative, grant number F9000315202081 from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture.

**References**

1. US Department of Agriculture-National Agricultural Statistics Service. Quick stats. USDA-National Agricultural Statistics Service. https://quickstats.nass.usda.gov/ (accessed September 2022).

2. Gailans, S., S. Carlson, K. Pecinovsky and B. Lang. 2015. Oat Variety and Fungicide Trials. Practical Farmers of Iowa Cooperators’ Program. https://practicalfarmers.org/research/oat-variety-and-fungicide-trials/ (accessed September 2022).

3. Gailans, S., S. Carlson, M. Schnabel, K. Pecinovsky, B. Lang and W. Johnson. 2016. Oat Variety Trials 2016. Practical Farmers of Iowa Cooperators’ Program. https://practicalfarmers.org/research/oat-variety-trials-2016/ (accessed September 2022).

4. Gailans, S., S. Carlson, M. Schnabel, K. Pecinovsky, B. Lang and W. Koehler. 2017. Oat Variety and Fungicide Trials 2017. Practical Farmers of Iowa Cooperators’ Program. https://practicalfarmers.org/research/oat-variety-and-fungicide-trials-2017/ (accessed September 2022).

5. Gailans, S., S. Carlson, M. Schnabel, K. Pecinovsky and W. Johnson. 2018. Oat Variety Trial 2018. Practical Farmers of Iowa Cooperators’ Program. https://practicalfarmers.org/research/oat-variety-trial-2018/ (accessed September 2022).

6. Gailans, S., S. Carlson, M. Schnabel, K. Pecinovsky and W. Koehler. 2019. Oat Variety Trial 2019. Practical Farmers of Iowa Cooperators’ Program. https://practicalfarmers.org/wp-content/uploads/2019/12/PFI2019\_ResearchReport\_Oat-Variety-Trial.pdf (accessed September 2022).

7. Gailans, S., L. English, M. Schnabel, K. Pecinovsky, D. Maxwell, R. Rosmann and M. Smith. 2020. Oat Variety Trial 2020. Practical Farmers of Iowa Cooperators’ Program. https://practicalfarmers.org/research/oat-variety-trial-2020/ (accessed September 2022).

8. Gailans, S. and L. English. 2021. Oat Variety Trial 2021. Practical Farmers of Iowa Cooperators’ Program. https://practicalfarmers.org/research/oat-variety-trial-2021/ (accessed September 2022).

9. Iowa Environmental Mesonet. 2022. Climodat Reports. Iowa State University. http://mesonet.agron.iastate.edu/climodat/ (accessed September 2022).