Belle was developed using the pedigree method of breeding. Primary selection criteria in the F₁ through F₆ generations were resistance to crown rust, lodging resistance, agronomic appearance, and high grain quality. Grain quality was measured by kernel filling, groat percentage, and size and shape of kernels and groats. In 1987, an F₂-derived F₆ line was selected, cut and threshed in bulk, and designated experimental line X5673-2, which ultimately became Belle. Line X5673-2 was entered in a preliminary yield trial at Madison, WI, in 1988. It was advanced to the main Madison nursery trial in 1989, and to drill plot trials at Arlington, WI, and statewide trials in 1990. It was entered into all of the above trials and the USDA-ARS Uniform Midseason Oat Performance Nursery in 1991 and 1992.

Belle is late in maturity, heading about 3 to 4 d later than 'Ogle' (2) and the same day as 'Porter' (5). Plant height of Belle is intermediate, averaging 7.8 cm taller than Ogle, but 5 cm shorter than 'Troy'. Lodging resistance is greater than either Ogle or Porter. Belle has high test weight and groat percentage, low groat protein percentage, and high grain yield. In Wisconsin tests for the 4-yr period 1993 to 1997, grain yield averages for Belle exceeded those of all current varieties tested, except 'Gem'. In the 1991 Uniform Midseason Oat Performance Nursery, Belle ranked 15th for yield among 35 entries.

Juvenile plants of Belle are erect. Leaves are glabrous, with ligules present. Culms are midsized, and culm nodes are hairless. Panicles are equilateral and midlong, with spreading branches. The rachis is erect to slightly flexuous. Spikelets separate from their pedicels by fracture, and florets separate by disarticulation of their rachilla segments, which are hairless. Glumes are glabrous. Lemmas are glabrous, and awns are infrequent. When present, awns are non-twisted. Belle has yellow, nonfluorescent, broad, well-filled kernels.

Belle is resistant to crown rust races CR13, CR20, CR36, CR50, CR152, CR169, Pe58, Pe59, Pe62, and Pe264B. In field trials in the Upper Midwest, Belle has been resistant to prevalent races of crown rust. Belle is resistant to oat stem rust (caused by *Puccinia graminis* Pers.-Pers. f. sp. *avenae* Eriks. & E. Henn.) races NA8 and NA16, but susceptible to races NA 25, NA26, and NA27. This reaction pattern is typical of genotypes with the AB genes for stem rust resistance. Belle has been resistant to bulk collections of loose smut [caused by *Ustilago avenae* (Pers.) Rostr.] in Wisconsin and Minnesota tests. It was intermediate in resistance to barley yellow dwarf virus in screening tests at Urbana, IL, and demonstrated good field tolerance in nurseries and commercial fields in Wisconsin.

Designated classes of certified seed of Belle are Breeder, Foundation, and Certified. Breeder seed of Belle is being maintained by the Department of Agronomy, University of Wisconsin–Madison, U.S. plant variety protection, with the Wisconsin Agricultural Research Station as owner, was granted in March 1996 (PVP Certificate no. 9600042).

Limited quantities of seed for research are available upon request from the corresponding author. Recipients of seed are asked to make appropriate recognition of the source of Belle if it is used in the development of a new cultivar, germplasm, parental line, or genetic stock.

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References and Notes

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Registration of ‘Gem’ Oat

‘Gem’ spring oat (*Avena sativa* L.) (Reg. no. CV-358, PI 596804) was developed by workers in the Department of Agronomy, College of Agricultural and Life Sciences, University of Wisconsin– Madison, and was released in March 1996. The parentage of Gem is *M00768* × *Holden* × *Griddell* × *amphiploid* × *Clay* 69363 × *Griddell* × *'Froker'*/71 ‘Ogle’. The final cross, X6166-1, Ogle, was made in 1984 in the field.

The breeding history of Gem is unique, in that one of the initial progenitors was a crown rust (caused by *Puccinia coronata* Corda var. *avenae* W.P. Fraser & Ledingham) resistant 6x amphiploid from a tetraploid × diploid cross (1,3,4), and irradiation with thermal neutrons in 1968 was a key step in stabilizing genes from a monosomic alien substitution line (6,7), the ultimate donor of the genes or genome for resistance to crown rust.

Gem was developed using the pedigree method of breeding. Primary selection criteria in the F₁ through F₆ generations were resistance to crown rust, lodging resistance, agronomic appearance, and high grain quality. Grain quality was measured by kernel filling, groat percentage, and size and shape of kernels and groats. In 1989, an F₂-derived F₆ line was selected, cut and threshed in bulk, and designated experimental line X6166-2, which ultimately became Gem. X6166-2 was entered in preliminary yield trials at Madison, WI, in 1990, was advanced to the main Madison nursery trial in 1991, and advanced to drill plot trials at Arlington, WI, and to statewide trials in 1992. It was evaluated in the USDA-ARS Uniform Midseason Oat Performance Nursery in 1992 and 1993.

Gem is midseason in maturity, heading about 3 d later than ‘Ogle’ (2) and 2 d earlier than ‘Porter’ (5). Plant height is intermediate: 5 cm taller than Ogle, but 5 cm shorter than ‘Troy’. Lodging resistance is equal to that of Ogle. Gem has good test weight, great percentage, groat protein percentage, and high grain yield. In Wisconsin tests for the 3-yr period 1994 to 1996, grain yield averages for Gem exceeded those of all current varieties tested. Gem ranked 1st for yield among 36 entries over 22 locations in the 1993 Uniform Midseason Oat Performance Nursery.

Juvenile plants of Gem are erect. Leaves are glabrous, with ligules present. Culms are midsized, and culm nodes are hairy. Panicles are equilateral and midlong, with spreading branches. The rachis is erect to slightly flexuous. Spikelets separate from their pedicels by fracture, and florets separate by disarticulation of their rachilla segments, which are hairless. Glumes are glabrous. Lemmas are glabrous, and awns are frequent. Awns are non-twisted and about 30 mm in length. Gem has yellow, nonfluorescent, large, well-filled kernels.

Gem is resistant to crown rust races CR13, CR152, and CR169. In field trials in the Upper Midwest, Gem has been resistant to prevalent races of crown rust. Gem is resistant to oat stem rust (caused by *Puccinia graminis* Pers.-Pers. f. sp. *avenae* Eriks. & E. Henn.) races NA8 and NA16, but susceptible to races NA 25, NA26, NA27, and NA55. This reaction pattern is typical of