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Published in Crop Sci. 42:674–675 (2002).

Registration of 6NDRFG-1 Six-Rowed Barley Germplasm Line with Partial Fusarium Head Blight Resistance

The six-rowed spring barley (*Hordeum vulgare* L.) germplasm line 6NDRFG-1 (Reg. no. GP-136, PI 615583) was developed by the North Dakota Agricultural Experiment Station and tested as C95-167-250-9. 6NDRFG-1 has partial resistance to Fusarium head blight (FHB) (incited by *Fusarium graminearum* Schw.) that is expressed as reduced numbers of FHB infected kernels and more significantly as reduced concentrations of the mycotoxin deoxynivalenol (DON). 6NDRFG-1 is an F₃₇ selection from the cross 'Foster'/CIho 4196. Foster (PI 592758) (Horsley et al., 1997) is a six-rowed malting barley susceptible to FHB and adapted for growth in the upper Midwest USA. CIho 4196 is an FHB resistant two-rowed accession received from China in 1925 and held in the USDA National Small Grains Collection.

6NDRFG-1 has a sessile six-rowed spike (*vvII*), semi-smooth lemma awns, and glume awn length equal to the length of the glume. Its covered kernels have long rachilla hairs and a white aleurone. Unlike many of the six-rowed genotypes with good FHB resistance, 6NDRFG-1 does not derive its resistance from 'Chevron' (PI 38061) or Chevron-derived lines (Prom et al., 1996). This may be advantageous because Chevron and resistant Chevron-derived progeny generally have fewer plump kernels and lower malt extract (Gebhardt et al., 1992). Thus, 6NDRFG-1 represents a six-rowed source of FHB resistance that may have alleles for acceptable malt quality not found in Chevron.

The F₂ population that 6NDRFG-1 was derived from was designated C95-167 and was grown at Fargo and Langdon, ND, in 1996. At maturity, 250 six-rowed plants were individually harvested from the population. Seed from these plants was sown as F_{2.3} families in FHB screening nurseries during the 1996-1997 winter at Shanghai, China, and the 1997 growing season at Langdon, ND. Plants in these and subsequent nurseries were inoculated with *F. graminearum* by the methods described by Xia (Xia, 1956) and modified by Prom et al. (1996). Fusarium head blight severity reported as percent infection was assessed at the soft dough stage (Zadoks 85) by counting the number of infected kernels on 10 to 15 random spikes in each F_{2.3} family. At both locations, the F_{2.3} family C95-167-250 was observed to have FHB severity similar to that of the resistant check Chevron. At Shanghai, FHB severity was 9.0% for C95-167-250, 6.5% for Chevron, and 24.0% for Foster. At Langdon, the FHB severity was 1.6% for C95-167-250, 3.7% for Chevron, and 34.8% for Foster.

Eleven F₃ plants were individually harvested from C95-167-250 grown at Langdon, ND, in 1997 and were designated C95-167-250-1 through C95-167-250-11. These F_{3.4} families were grown in FHB screening nurseries at Fargo, Langdon, and Osnabrock, ND, in 1998, where C95-167-250-9 was observed to have the lowest FHB severity and DON accumulation. Averaged across the three locations, FHB severity and DON concentration were 16.6% and 5.8 $\mu\text{g g}^{-1}$ for C95-167-250-9, 4.7% and 8.4 $\mu\text{g g}^{-1}$ for Chevron, and 52.8% and 27 $\mu\text{g g}^{-1}$ for Foster, respectively. At Hangzhou, China, during winter 1997-1998, FHB severity was 10.0% for C95-167-250-9, 5.3% for Chevron, and 19.8% for Foster.

In greenhouse screening at Fargo ND, by the method of Prom et al. (1996) during spring 1999, FHB severity was 16.3%

for C95-167-250-9, 9.2% for Chevron, and 41.2% for Foster. In 1999 screening nurseries at Langdon and Osnabrock, ND, FHB severity averaged 16.3% for C95-167-250-9, 18.9% for Chevron, and 50.5% for Foster.

In 1999 at Langdon and Osnabrock, mean days to heading for C95-167-250-9 was similar to Chevron and about 10 d later than Foster. Mean plant height of C95-167-250-9 was similar to Chevron (130 cm) and much taller than Foster (100 cm).

Small quantities of seed (5 g) of 6NDRFG-1 are available upon written request from the corresponding author. Appropriate recognition of source should be given if this germplasm contributes to research or development of new cultivars.

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Published in Crop Sci. 42:675 (2002).

Registration of *Leymus* Hybrid-1 Wildrye Germplasm

Leymus hybrid-1 wildrye germplasm (Reg. no. GP-82, PI 618816) was developed by the USDA-ARS, Forage and Range Research Laboratory in cooperation with the Utah Agricultural Experiment Station at Utah State University and released in January 2001. It was derived from a segmental alloautopolyploid population that originated from intercrossing three hybrids: (i) mammoth wildrye [*Leymus racemosus* (Lam.) Tzvelev ($2n = 4x = 28$)]/Altai wildrye [*L. angustus* (Trin.) Pilger ($2n = 12x = 84$)], (ii) Great Basin wildrye [*L. cinereus* (Scribner & Merr.) A. Löve ($2n = 8x = 56$)]/Altai wildrye, and (iii) a backcross hybrid, mammoth wildrye//Altai wildrye.

In 1982, seed of the above *Leymus* hybrid populations was acquired from Dr. Douglas Dewey at Logan, UT (Dewey, 1972, 1978). Population I was a cross between *L. racemosus* (PI313965)/*L. angustus* (PI314682) which produced a 70-chromosome hybrid that resulted from an unreduced *L. racemosus* egg ($n = 28$), fertilized by a reduced *L. angustus* gamete ($n = 42$). Population II was a 98-chromosome hybrid that originated from a cross that involved an unreduced *L. cinereus* (PI286809) gamete ($n = 56$) and reduced *L. angustus* (PI 314672 and 314682) pollen ($n = 42$). Population III was a backcross of *L. racemosus*//*L. angustus*. Chromosome numbers in the backcross population ranged from 76 to 78. In 1983, F₂ seedlings from the three *Leymus* hybrids were established at the Evans farm near Logan, UT, in spaced-plant nurseries.

In 1984, cycle-1 open pollinated (OP) seed across hybrids