'Grenora' (Reg. no. CV-1010, PI 642022), spring durum wheat (*Triticum turgidum* L. var. *durum* Desf.) was developed by the North Dakota Agricultural Experiment Station in cooperation with USDA-ARS and released on 1 June 2005. Grenora is named after a community in northwest Williams County in North Dakota. The name Grenora is derived from name parts of the Great Northern Railway. Grenora was released primarily for its high grain yield and quality.

Grenora was tested as the experimental line D97780 and was selected from the cross D901260/D901419 made in 1993. The parent D901260 was derived from the cross D8302//‘Sceptre’. The pedigree of D8302 is D763/D73121//‘Vic’ (CI 17789). D763 was derived from the cross D7233//‘Edmore’ (CI 17748). D7233 was derived from the cross D6515//‘Ward’ (CI 15892). The pedigree of D6515 is Ld393//‘Yuma’. D73121 was derived from the cross D65150//‘Leeds’ (CI 13768)//‘Ward’. The cross of D65150 is Pi/TM//2*Tc/3ZB//‘Wells’ (CI 1333). The pedigree of D901419 is ‘Laker’/D79209//D8012. D79209 was derived from the cross D7224//‘Cando’ (CI 17438). D7224 was derived from the cross D6530/D6654. The pedigree of D6530 is D65150//‘Cappelli’. D6654 was derived from the cross D61130//Leeds. The cross of D61130 is ‘Lakota’ (CI 13335)//DwF4//‘Langdon’ (CI 13165). The pedigree of D8012 is D7075//‘Vic’. D7075 was derived from the cross D62220/D57114//Leeds. The pedigree of D62220 is Ld357//‘Stewart’/Ld357. D57114 was derived from the cross Ld357/C17513.

Grenora was developed using the pedigree breeding method and was bulked in the F5 generation as an F4-derived line in 1997. Six-thousand F4:12 heads were selected from quality drill strips at Langdon, ND for seed purification. Heads were threshed individually and seeded as head rows at Yuma, AZ, in 2004. Non-uniform rows were discarded and the remaining rows were bulk harvested as breeder seed. Grenora is a daylength-sensitive durum wheat that is similar in heading date (64 d from seeding to when approximately 50% of the plants had heads completely emerged from the boot) to ‘Ben’ (Elias et al., 1998) and 1 d earlier than ‘Mountrail’ (Elias et al., 2000b). Grenora has an average plant height of 83 cm compared to 90 cm of Ben and 73 cm of the semidwarf cultivar Plaza (Elias et al., 2001b). The culm of Grenora is white and the peduncle is erect. Grenora has midlong spikes that are awned, oblong, lax, and erect. The awns are white and 14 to 15 cm long. The glumes are oblique, white, medium, and medium in width. The kernels are amber, hard, long, and elliptical; the germ is large; the crease is mid-wide and shallow and the brush is short.

Based on 38 location-years of testing in the Uniform Regional Durum Nursery (URDN) from 2001 to 2004. The mean grain yield of Grenora (4092 kg ha$^{-1}$) was higher than Ben (3769 kg ha$^{-1}$) ‘Maier’ (3722 kg ha$^{-1}$) (Elias et al., 2000a), Mountrail (3984 kg ha$^{-1}$) and ‘Pierce’ (3884 kg ha$^{-1}$) (Elias et al., 2004). In those same trials, Grenora had a 762.5 kg m$^{-3}$ grain volume weight compared to 762.4 kg m$^{-3}$ of Maier and 780.5 kg m$^{-3}$ of ‘Lebsock’ (Elias et al., 2001a). Grenora had a 38.4 mg kernel weight compared to 35.9 mg of Maier and 40.1 mg of Ben. Based on 23 location-years in the North Dakota Research Extension Centers’ varietal trials from 2001 to 2004, Grenora had higher grain yield (3763 kg ha$^{-1}$) than, Ben (3534 kg ha$^{-1}$), Maier (3440 kg ha$^{-1}$), Mountrail (3635 kg ha$^{-1}$) and Pierce (3554 kg ha$^{-1}$). In those same trials, Grenora had a 774.1 kg m$^{-3}$ grain volume weight compared to 774.0 kg m$^{-3}$ of Maier and 790.8 kg m$^{-3}$ of Lebsock.

Grain samples from quality drill strips grown at 19 location-years (2001 to 2003) were tested for durum wheat quality at North Dakota State University (NDSU). The semolina extraction rate of Grenora was 64.8% on the Buhler-Miag laboratory mill at the Department of Cereal and Food Sciences, NDSU compared to 64.2% of
Mountrail, 65.1% of Ben, and 65.3% of Lebsock. Grenora has strong gluten mixing characteristics (classification: 7.0) as estimated by mixograph compared to 7.2 of Pierce and 5.2 of Mountrail. Semolina protein of Grenora was 137 g kg\(^{-1}\), which is numerically exactly the same as Lebsock and Mountrail. Pasta produced from Grenora has a color score of 9.2 compared to 8.9 of Mountrail.

Grenora was evaluated at the USDA-ARS, Northern Crop Science Laboratory, Fargo, ND for reaction to wheat stem rust (caused by \textit{Puccinia graminis} Per.:Pers. f. sp. \textit{tritici} Eriks. & E. Henn) and was found to be resistant to pathotypes Pgt-QCCJ, -QTHJ, -RTQQ, -TMLK, -TPMK, and -HPHJ. Grenora has exhibited adult plant resistance (reaction type 5R to 10R) to leaf rust (caused by \textit{P. triticina} Eriks.) similar to Maier and Lebsock when evaluated in the URDN at Langdon, ND from 2001 to 2004. On a scale of 0 to 9 where 0 is resistant and 9 susceptible, Grenora had average score of 3.3 in field reaction to tan spot [caused by \textit{Pyrenophora tritici-repentis} (Died.) Drechs] compared to 4.1 and 4.7 of Maier and Mountrail, respectively. Grenora had 21% disease severity to Fusarium head blight [caused by \textit{Fusarium graminearum} Schwabe; teleomorph \textit{Gibberella zeae} (Schweinitz) Petch] compared to 28% of Maier and 30% of Ben.

Breeder seed of Grenora will be maintained by the Seed Stocks Project, Agricultural Experiment Station, North Dakota State Univ., Fargo, ND 58105-5051. Grenora is protected under The U.S. Plant Variety Protection Act for Foundation, Registered, and Certified seed classes (PVP Certificate no. 200600107). Contact the durum wheat breeder or the Seed Stock Project, Agricultural Experiment Station, North Dakota State Univ., Fargo ND 58105-5051 for seed request. No seed will be distributed without written permission for 20 yrs from July 2005 by the Agricultural Experiment Station, North Dakota State Univ., Fargo ND 58105-5051. Seed of this release is deposited in the National Plant Germplasm System where it will be available after the expiry of the Plant Variety Protection for research purposes, including development and commercialization of new cultivars. It is requested that appropriate recognition be made if this germplasm contributes to the development of new germplasm or cultivars.

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References


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