Registration of 'Divide' Durum Wheat

'Divide' (Reg. no. CV-1009, PI 642021), 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. Divide was named after Divide County, a major durum production area in northwestern North Dakota. Divide was released based on its high grain yield potential and excellent quality.

Divide was tested as the experimental line D971511 and was selected from the cross ‘Ben’ (PI 596557)/D901282//’Belzer’ (PI 603286) made in 1993 (Elias and Miller, 1998) and (Elias et al., 1999). The parent D901282 was derived from the cross D84102/'Regold'. The pedigree of D84102 is D7984/D7926. The parents of D7984 are ‘Ward’ (CI 15892) and ‘Vic’ (CI 17789), (Quick et al., 1974, 1980). D7926 was derived from the cross D7456/Vic. D7456 was derived from the cross D6771/'Rugby’ (CI 17284) (Quick et al., 1975). The pedigree of D6771 is ‘Stewart 63’ (CI 12066)/Yt54/N10B (Knott, 1964).

Divide was developed using the pedigree breeding method and was bulked in the F₄ 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. Divide is a daylength-sensitive durum wheat that is similar in heading date (65 d from seeding to when approximately 50% of the plants had heads completely emerged from the boot) to ‘Mountrail’ (Elias et al., 2000b) and 1 d later than ‘Ben’. Divide has an average plant height of 89 cm, which is similar to Ben and 16 cm taller than the semidwarf cultivar Plaza (Elias et al., 2001b). The culm of Divide is white and the peduncle is erect. Divide has midlong spikes that are awned, oblong, middense, and erect. The awns are white and 15 to 16 cm long. The glumes are oblique, white, medium, and wide. The kernels are amber, hard, long, and elliptical; the germ is large; the crease is mid-wide and shallow; and the brush is long.

Based on 38 location-years of testing in the Uniform Regional Durum Nursery (URDN) from 2001 to 2004, the mean grain yield of Divide (3971 kg ha⁻¹) was higher than Ben (3769 kg ha⁻¹), ‘Maier’ (3722 kg ha⁻¹) (Elias et al., 2000a), and ‘Pierce’ (3884 kg ha⁻¹) (Elias et al., 2004). In those same trials, Divide had a 767.7 kg m⁻³ grain volume weight, which was higher than Maier (761.2 kg m⁻³) and 12.8 kg m⁻³ lower than ‘Lebsock’ (Elias et al., 2001a). Divide had a 38.7 mg kernel weight, which was greater than Maier (35.9 mg) and lower than Ben (40.1 mg). Based on 23 location-years in the North Dakota Research Extension Centers’ varietal trials from 2001 to 2004, Divide had higher yield (3675 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, Divide had a 778.0 kg m⁻³ grain volume weight which was similar to Maier and 12.8 kg m⁻³ lower than 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 Divide (64.8%) on the Buhler-Miag laboratory mill at the Department of Cereal and Food Sciences, NDSU, was higher than Mountrail (64.2%) but lower than Ben (65.1%) and Lebsock (65.3%). Divide has strong gluten mixing characteristics (classification: 7.3) as estimated by mixograph, similar to Pierce (7.2) and stronger than Mountrail (5.2). Semolina protein of Divide was 142 g kg⁻¹, which was similar to Ben but higher than Mountrail (137 g kg⁻¹). Pasta produced from Divide has a color score of 9.1 which is similar to Maier and Lebsock but higher than Mountrail (8.9).
Divide was evaluated at the USDA-ARS, Northern Crop Science Laboratory, Fargo, ND for wheat stem rust (caused by *Puccinia graminis* Per.:Pers. f. sp. *tritici* Eriks. & E. Henn) and was found to be resistant (reaction type 0) to pathotypes Pgt-QCCJ, -QTHJ, -RTQQ, -TMLK, -TPMK, and -HPHJ. Divide has exhibited adult plant resistance (reaction type 0 to 5R) to leaf rust (caused by *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, Divide had average score of 3.2 in field reaction to tan spot [caused by *Pyrenophora triticicrepentis* (Died.) Drechs] compared to 4.1 and 4.7 of Maier and Mountrail, respectively. Divide has lower disease severity (23%) to Fusarium head blight [caused by *Fusarium graminearum* Schwabe; teleomorph *Gibberella zeae* (Schweinitz) Petch] than Maier (29%) and Ben (31%).

Breeder seed of Divide will be maintained by the Seed Stocks Project, Agricultural Experiment Station, North Dakota State Univ., Fargo, ND 58105-5051. Divide is protected under The U.S. Plant Variety Protection Act for Foundation, Registered, and Certified seed classes (PVP Certificate no. 200600106). 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.

E.M. ELIAS* and F.A. MANTHEY

**Acknowledgments**

The authors thank D.M. Williams (Dep. of Plant Sciences, NDSU, Fargo) for seed maintenance; B.L. Hinsz (Dep. of Cereal Science, NDSU, Fargo) for field plot quality evaluations; G.A. Hareland (USDA-ARS, Fargo) for Uniform Regional Durum Nursery quality evaluations; R.W.Stack (Dep. of Plant Pathology, NDSU, Fargo) for Fusarium head blight evaluations and Jack Rasmussen (Dep. of Plant Pathology, NDSU, Fargo) for leaf rust evaluations.

**References**


* Corresponding Author (Elias.Elias@ndsu.edu).